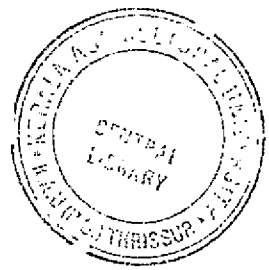
INDIGENOUS AGRICULTURAL PRACTICES IN RICE FARMING BY TRIBAL AND NON TRIBAL AGRICULTURAL LABOURERS AND FARMERS IN WAYANAD DISTRICT: A COMPARATIVE ANALYSIS



By

VISHNU NARAYANAN P.M

2014-11-189

THESIS

Submitted in partial fulfilment of the

requirement for the degree of

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DEPARTMENT OF AGRICULTURAL EXTENSION

COLLEGE OF AGRICULTURE

VELLAYANI, THIRUVANANTHAPURAM- 695 522

KERALA, INDIA

2016

DECLARATION

I, hereby declare that this thesis entitled **"INDIGENOUS AGRICULTURAL PRACTICES IN RICE FARMING BY TRIBAL AND NON TRIBAL AGRICULTURAL LABOURERS AND FARMERS IN WAYANAD DISTRICT: A COMPARATIVE ANALYSIS"** is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.

Vellayani,

Date: 4/11/2016

Vishnu Narayanan P.M

(2014-11-189)

CERTIFICATE

Certified that this thesis entitled **"INDIGENOUS AGRICULTURAL PRACTICES IN RICE FARMING BY TRIBAL AND NON TRIBAL AGRICULTURAL LABOURERS AND FARMERS IN WAYANAD DISTRICT: A COMPARATIVE ANALYSIS"** is a record of research work done independently by **Mr. Vishnu Narayanan P.M (2014-11-189)** under my guidance and supervision and that it has not previously formed the basis for the award of any degree, diploma, fellowship or associate ship to him.

Vellayani,

Date: 4/11/2016

Dr. A. Anil Kumar

Professor

Department of Agricultural Extension

College of Agriculture

Vellayani, Thiruvananthapuram–695 522

CERTIFICATE

We, undersigned members of the advisory committee of **Mr. Vishnu Narayanan P.M** (2014-11-189)a candidate for the degree of **Master of Science in Agriculture** with major in Agricultural Extension, agree that this thesis entitled**"INDIGENOUS AGRICULTURAL PRACTICES IN RICE FARMING BY TRIBAL AND NON TRIBAL AGRICULTURAL LABOURERS AND FARMERS IN WAYANAD DISTRICT: A COMPARATIVE ANALYSIS"**may be submitted by Mr. Vishnu Narayanan P.M. (2014-11-189), in partial fulfilment of the requirement for the degree.

Dr. A. Anil Kumar
Professor and Chairman
Department of Agricultural Extension
College of Agriculture, Vellayani,
Thiruvananthapuram – 695 522

Dr.V.B.Padmanabhan
Professor and Head
Department of Agricultural Extension
College of Agriculture, Vellayani,
Thiruvananthapuram - 695522

Dr. Allan Thomas
Asst Professor(sr.scale)
Department of Agricultural Extension
College of Agriculture, Vellayani,
Thiruvananthapuram - 695522

Mrs. Brigit Joseph
Associate Professor,
Department of Agricultural Statistics
College of Agriculture, Vellayani,
Thiruvananthapuram – 695522

EXTERNAL EXAMINER

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INTRODUCTION

1. INTRODUCTION

Rice is traditional staple food crop of India originated in Indo China – Hindustan centre of origin. Rice farming is deeply rooted in the culture of India. First mention of rice was in *Yajur veda* (1500-800 BC). Rice is often directly associated with prosperity, royalty, and fertility, hence there is the custom of tossing rice at newlyweds and rice is offered as a first food to infants when they start eating solids or to husband by his new bride, to ensure they will have children. India has probably grown 30,000 different varieties of rice. Kerala is famous for its medicinal rice like *chennellu, njavara, karuthachembavu, erumakkari* etc., there were many indigenous agricultural practices existed in the rice growing tracts of Kerala. The cultivation practices were orchestrated with the rhythm of nature by following *njatuvelas'* and organic farming practices. Sustainable and subsistence farming practices were followed.

But with the advent of 'green revolution' and introduction of high yielding varieties, the National gene bank now holds only 7,000 of these traditional rice varieties. Along with the loss of traditional varieties, the traditional agricultural practices also vanished. Moreover, the post-green revolution has led to the slowing yield rates and reduction in input efficiency. With this the sustainability of rice production is being questioned. It has created serious problems of salinity, water logging, soil erosion and land degradation in different regions of the country. Over exploitation of natural resources may have short term gains but it can often lead to serious ecological degradation.

The birth of the concept of sustainable agriculture in late eighties in Indian agricultural scenario has conjured interest on indigenous technical knowledge (ITK) that promotes the use of natural products to solve the problems relating to agriculture and subsidiary activities. Indian farmers, over centuries, have learnt to grow food and to survive in challenging environments, where the rich tradition of ITK has been interlinked with the agricultural practices followed by them.

Indigenous technical knowledge is generally associated with biological resources and is invariably an intangible component of such a natural resource. Traditional knowledge has the potential of being transformed into commercial benefits by providing leads or clues for advancement of useful practices and processes for the benefits of mankind. Some countries have specific legislation protecting this kind of knowledge while some other countries feel their existing IPR regime protect such knowledge.

A regional policy has to be developed for the protection of indigenous knowledge related to biodiversity which includes agriculture, medicinal, ecological related knowledge; and also for the protection of other traditional knowledge relating to folklore. In the Kerala context rice faming is becoming relatively uneconomic due multiple reasons. Relatively low income in rice farming in comparison to other crops especially cash crop is an important factor adversely affecting the continuance of rice cultivation. Conversion of land in favour of commercial cash crops, scarcity of agricultural labourers, the influence of NRI's in state economy etc., are the major reasons for the reduction in area under rice farming. But the tribal labourers and farmers in Wayanad consider rice farming as their cultural responsibility rather than a means of income. The population of tribespeople was highest in Wayanad district (31.24 per cent). Thus, Wayanad was selected for this study inorder to examine tribal agriculture and the indigenous agricultural practices especially in case of rice farming.

Wayanad is a north Malabar district of Kerala which is nestled on the Western Ghats. Agriculture is the principal occupation in this district. The term Wayanad is derived from '*vayalnadu*' which means the land of rice fields. Wayanad is an extensive mountain valley, located 11.27' to 15.58' north latitude and 75.47' to 70.27' east longitude, covering an area of 2132 sq.km. As per 2011 population census, the Scheduled Tribe population of Kerala was 484839 persons which constituted 1.45 per cent of the total population of the State. They constitute about 17 per cent of the district population. Wayanad is a home of many tribal communities' *viz* Kuruchiya, Paniya, Adiya, Kattunaikas (Then Kurumas), Betah Kurumas and Mullu Kurumas, along with six other minor communities (Abraham

2006). Tribal hamlets are found in all the panchayats of the district. Tribespeople, who are otherwise known as "*Adivasis*", are generally docile, simple, honest, hardworking and hospitable. Economically they are poor and backward. They are physically oppressed and culturally isolated. They are socially ostracised, segregated and humiliated. They are politically unconscious and unorganised as they have little education to understand issues in the right perspective. However scenario is undergoing change due to affirmative actions by the Government owing to the constitutional safeguards in the constitution and administration at the global level.

Wayanad is a showcase for the most vibrant and yet conflicting social and cultural ethos. Once, it was a place uniquely inhabited by the tribespeople. The consequent migration of settler farmers initially from Malabar region and later from Tranvancore in the first and second half of the twentieth century, which eventually made the tribes a minority, constituting less than half of the total population. Lack of adequate support, inappropriate implementation of developmental plans, pilferage of funds and exploitation has often been the reasons for the stagnation of tribal economy of Wayanad. In this study a comparative analysis of various socio-economic factors among tribal labourers, non-tribal labourers and farmers were done. The implication of the study divulges with the present status of the tribal people in the Wayanad district compared to other communities.

1.2 NEED FOR THE STUDY

The main aim of the study is to identify the various indigenous agricultural practices present in the Wayanad district regarding rice farming. Along with this the comparative analysis of various socio-economic indicators and its implications among the tribal labourers, non-tribal labourers and farmers, which reveals the strata were the tribal labourers are placed. This study spot on the issues faced by the tribal labour community, as they were the most neglected, dispossessed and subjugated class in rural hierarchy.

Hence this study "Indigenous agricultural practices in rice farming by tribal and non-tribal agricultural labourers and farmers in Wayanad district: A Comparative analysis" assumes significance.

1.3 SCOPE OF THE STUDY

1. Identification and documentation of indigenous practices in rice farming may be useful in preparing an "indigenous technology package for rice: for various agro climatic regions". Scientific sound research and technology generation from these practices, and dedicated extension task force for eco-technology may result in successful implementation of sustainable farming.
2. Eliciting the science underlying indigenous knowledge system would help up to understand the concepts and practices depicting the ecologically sustainable option of resource use.
3. The finding of this study may lead to accelerate the technological change through re-oriented research wherein eco-friendly technology can be integrated with modern approaches to evolve economically efficient, socially acceptable and sustainable food production technology.
4. The finding in study helps in identifying the indigenous knowledge among tribal labourers, non-tribal labourers, and farmers and the extent to which the utilisation of those practices is also there.
5. It helps to compare various social indicators among the three groups' namely tribal labourers, non-tribal labourers, and farmers.
6. Research on this complex folkscience not only enables the scientists to come in direct contact with farmers but also attempts a multi-disciplinary approach for problem solution.

1.4 OBJECTIVES OF THE STUDY

- To identify and document the indigenous agricultural practices and study its scale of practice by tribal and non-tribal agricultural labourers and farmers.
- To study their work participation, social participation, media utilization, profile characteristics and constraints.

1.5 LIMITATIONS OF STUDY

The researcher faced many issues during the survey. Many different tribal hamlets were found scattered throughout Wayanad. Most of these were not accessible by motorised vehicle and must be reached on foot. The language was another limitation. The tribal language might vary from Malayalam and Tamil, they also used their own colloquial languages.

Identification of indigenous practices otherwise required an exhaustive probe covering all the major rice growing tracts of Wayanad district. The time factor, which is crucial for any study, was another limitation. Since respondents were illiterate and reluctant to share whatever quantitative information they knew, data collection was constrained to that extent. Since this study was completely based on perception and expressed opinion of the respondents it might not be free from personal bias and prejudices. Localisation of indigenous practices has affected the general applicability of each practice to different locations. This was the major constraint in the measurement of knowledge and extent of adoption of indigenous practices. Care was taken to avoid this and make the study as objective as possible. If these limitations were rectified the research programme will provide a streamline for future researchers in this area.

1.6 PRESENTATION OF THE STUDY

The report of the study is presented in five chapters. The first chapter deals with introduction, wherein the statement of the problem, need, scope and limitations of the study are discussed. The second chapter covers the review of the past studies related to the present study. The third chapter is methodology which encompasses the details on selection of the study area, sampling, data collection procedure, variables selection, empirical measures used, design of the research, statistical tools used etc. In the fourth, chapter the results in relation to objectives with interpretation of the findings and discussion are presented. The fifth chapter summarizes the study highlighting the salient findings. The references, appendices and abstract of the thesis are given at the end.

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

The chapter aims at developing a theoretical framework on the concept of "Indigenous agricultural practices in rice farming by tribal and non-tribal agricultural labourers and farmers in Wayanad district: A Comparative analysis". This has been furnished on the basis of definitions, ideas and concepts. Each topic presented in the chapter is associated with the available research findings either directly or indirectly. This helps to give a proper orientation of the study and also to place the problem on a theoretical perspective. This also assists in evaluating one's own research efforts by comparing them with the related effort of others.

The review has been presented under the following heads:

2.1 Concept of tribe.

2.2 Tribespeople of Wayanad.

2.3 Rice farming in Wayanad district.

2.4 Agricultural labour and tribespeople.

2.5 Indigenous agricultural practices and its scale of practice.

2.6 Social participation

2.6 Work participation

2.7 Media utilization

2.8 Profile characteristics.

2.1 CONCEPT OF TRIBE

The term tribes commonly signifies a group of people speaking a common language, observing uniform rules of social organisation 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).

Tribe may be defined as a group of people speaking a common language, observing uniform rules of social organisation 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).

Mehtha (2006) defined tribes as a social group usually with a definite area, dialect, cultural homogeneity and unifying social organization having several subgroups such as clans or sibs.

According to Britannica encyclopedia (2015) Tribe is a notional form of human social organization based on a set of smaller groups, having momentary or permanent political integration, and defined traditions of common descent, language, culture, and ideology.

According to oxford dictionary (2015) tribe is a social division in a traditional society consisting of families or communities linked by social; economic, religious, or blood ties, with a common culture and dialect, typically having a recognized leader.

According to Thakur and Thakur (2009) the term tribes commonly signifies a group of people using common language, observing uniform social rules and working together for a common goal.

According to Cambridge dictionary (2015) tribe is a group of people, often of related families, who live together, sharing the same language, culture, and history, especially those who do not live in towns or cities.

Most of the primitive tribal groups are small in number, have not attained any significant level of social and economic progress and generally inhabit remote localities having poor infrastructure and administrative support. Therefore, they become the most vulnerable sections among the scheduled tribes (Government of India, 2008).

Tribal population in Kerala is only 1.45 per-cent of the whole population, Census (2011)

2.2 TRIBESPEOPLE OF WAYANAD

According to Bindu (2008), among the primitive tribes of Kerala, majority is *Kattunaikans* [71.17%] and is mainly in Wayanad district. The areas of habitats of the primitive tribes are Nilambur [*Cholanaikan and Kattunaikans*], Attappady [*Kurumbas*], Wayanad, Kozhikode [*Kattunaikans*], Thrissur [*Kadars*], and Kasaragod [*Koragas*].

Abraham (2014) reported that Wayanad is a home of many tribal communities *viz* Kuruchiya, Paniya, Adiya, Kattunaikas (Then Kurumas), Betah Kurumas and Mullu Kurumas, along with six other minor communities.

2.3 RICE FARMING IN WAYANAD DISTRICT

Rice is a predominant crop in Wayanad district few decades ago. Modern agricultural practices engulfed the traditional practices and traditional varieties from the district. Only few pockets of the district having the traditional land races. Veliyan, adukkan, thondi etc. were the traditional varieties. Nitheeshkumar (2010)

Sumalatha (2010) reported that the traditional aromatic varieties, *Jeerakashala* and *Gandhakashala* is having good yield and better palatability.

2.3 AGRICULTURAL LABOUR AND TRIBESPEOPLE

Agricultural labourer is a person who follows one or more of the following agricultural occupations in the capacity of a labourer on hire or exchange whether paid wholly in cash or kind or partly in cash or kind.

a) Farming including cultivation, tillage of soil

b) dairy farming, rearing of livestock or poultry

c) Any practice performed on a farm as incidental to or in conjunction with farm operations.

According to Panoor (1963), tribals or aboriginals in Wayanad is regarded as agricultural labourers in the rice fields of landlords and farmers.

Agricultural labourers, mostly landless, constitute the poorest segment of the Indian agricultural population. They belong to the economically backward and oppressed section of the society. They mainly belong to the scheduled castes and other backward communities. They are basically unskilled and unorganized and work in farms of prosperous big farmers as casual workers on wages for a larger part of the year (Padhi, 2007).

2.4 INDIGENOUS AGRICULTURAL PRACTICES AND ITS SCALE OF PRACTICE

Indigenous Knowledge is the sum of total knowledge and practices that are based on people's accumulated experience in dealing with situations and problems in various aspects of life and such knowledge and practices are special for a particular cultural (Wang, 1988)

According to Altieri (1991), local knowledge can be defined as the accumulated knowledge, skills and technology of local people, derived from the direction interaction of human beings and their environment.

Goldman (1991) stated indigenous knowledge as reflecting climatic and socio-economic factors, embedded as they are in social organization, cultural traditions and preferences and even more fundamentally in the conceptual system in which the individual members of the society have learned to think and in terms of which they interact their society and environment.

Indigenous Knowledge is the knowledge of people living in certain area generated by their own and their ancestors' experience including the knowledge that originated from elsewhere and has been internalized by the local people (Reijntjes, 1992)

Talwar and singh (1994) reported that agricultural practices that are evolved locally and inherited over a long period of time are referred to as indigenous agricultural practices.

Indigenous Knowledge refers to unique, traditional, local knowledge existing within and developed around the specific conditions of a woman and man Indigenous to a particular geographical area. (Grenier, 1998)

The knowledge derived through trial and error with many crops and practices and with sharing of knowledge within many farming families; which are crop, climate and soil specific are referred to as indigenous knowledge (Babu, 2000).

Bonny (2001) reported that farmers in Kuttanad is following a mixture of indigenous practice and modern practices in paddy cultivation.

The information gained over a period of time was passed on from generation to generation by word of mouth, this knowledge in today's parlance is called local knowledge, traditional knowledge or simply indigenous knowledge (Gupta, 2002).

According to Swapna (2003), ITK/IK in agriculture are used synonymously to indicate farmers' practical knowledge about their local production system their farming techniques and skills to manage with their natural resources to gain the basic needs with sustainability. It is dynamic technique to a given culture or society.

Rathakrishnan *et.al.* (2009) reported that indigenous agricultural practices were the back bone of natural resource management and sustainable agriculture.

Natarajan and Govind (2006) reported that most of the tribal people of Kalrayan hills in Tamil Nadu falls under medium and high levels of adoption of indigenous agricultural practices in rice farming.

About two third (65.00 per-cent) of the respondents in Vellore district of Tamilnadu had a medium adoption index with respect to indigenous agricultural practices. With regard to the management characteristics studied, the majority of the respondents had a medium level of management orientation (75 per-cent). (Jayakumar and Sundaramari, 2014)

Venkatesan *et al.* 2016 asserted that tribal farmers in Kolli hills of Namakkal district in Tamil Nadu had high adoption of indigenous practices as they are doing organic farming for the certification.

2.5 SOCIAL PARTICIPATION

Sasankan (2001) found that majority (76.00 per-cent) of the farmer respondents had medium level of social participation due to lack of credible institutions and extension contacts.

Redddy (2003) revealed that more than half of the respondents (60 per-cent) had medium level of social participation followed by low (25.00 per-cent) and high (15.00 per-cent) level of mass media exposure respectively.

Prabhu (2011) in his study on MGNREGP in Palakkad reported that regarding social participation 95.00 per-cent of the respondents participated in gramasabha meeting and 56.00 per-cent of the respondents participated in identification of work.

Jaganathan *et.al.* (2012) reported that famers with high social participation had high knowledge level on organic farming.

Bihari *et.al.* (2012) reported that social participation is negatively correlated and significant to role performance and knowledge level of tribal women farmers.

Mukherjee *et.al.* (2012) reported that Tata kisan sansar member famers in Aligarh district were had high social participation.

Majority of the farmers in Dhoddballapur of Karnataka state had medium to high level of social participation (Swamy, 2012).

Badodiya *et.al.* (2013) reported that social participation is negatively correlated and significant to health hazards among tribal farm women in agricultural operations.

Sachana (2015) reported that 68.00 per-cent of the tribal women in Attapadi had low social participation.

Patel *et.al.* (2016) reported that social participation exerted a negative total indirect effect on overall extent of contribution of tribal farmwomen in agricultural operations.

According to Patel *et.al.* (2016) majority (85.00 per-cent) of the tribal farm women in Dahod district of Gujarat had low social participation.

2.6 WORK PARTICIPATION

Among tribal groups in Wayanad district the paniyas and adiyas were having highest work participation in rice farming. (Nair, 1982)

According to Srivasthava and Srivastava (2010) Women seems to be the major work force in different operation in rice farming.

Kumar and Anjali (2004) reported that Women agricultural labourers seems to have more work participation and they were assigned with more drudgery works.

Waris *et.al.* (2016) found that in rice farming women agricultural labourers are more compared to male labourers and they hold more work participation than male labourers in Andhra Pradesh.

2.7 MEDIA UTILIZATION

Pradeepkumar (1993) found that mass media contact was positively and significantly related with the extent of participation in agricultural and allied fields.

Oommen (2007) had reported that 51.00 per-cent of respondents had medium level of mass media exposure followed by 29.00 per-cent with high level of mass media exposure.

Prabhu (2011) in his study on MGNREGP in Palakkad reported that 98.00 per-cent of the respondents had exposure to TV and 59.00 per-cent were listening radio for information.

Anoop (2013) in his study about *Paniya* tribe the tribespeople were not much exposed to mass media as most of them were deprived of the same.

Haseenabeevi (2014) in her study about the radio listening behavior, more than half (58.34 per-cent) of the farmers had medium mass media exposure.

Sachana (2015) found that tribal women in Attapadi had low media exposure as most of them had poor livelihood status.

Jaganathan *et.al.* (2012) reported that famers with high media exposure had high knowledge level on organic farming.

Anithakumari *et.al.* (2015) found that mass media exposure had a higher impact on farmers' in relation with the pest management in coconut.

2.8 PROFILE CHARACTERISTICS

2.8.1 Age

Anoop (2013) reported that less than a half (48.00 per-cent) of respondents among Paniya tribe of Wayanad were middle aged categories and 26.00 per-cent of them were young and old categories respectively.

About two third of the tribes in Attappady belonged to middle age that is 66.00 per-cent. Only 15.00 per-cent came under old age category and the remaining 19.00 per-cent belonged to young category (Sachana, 2015).

2.8.2 Family Size

Rajendralal (2005) reported that while considering certain major communities, the average family size in respect of the *Paniyans* worked out to 4.5, *Mala Arayans* 5.5, *Irulas* 4.42 and *Kurichians* 5.45.

Prabhu (2011) in his study on MGNREGP in Palakkad reported that forty per-cent of the respondents had 4 members in their families and most of them lived in nuclear family.

Shincy (2012) in her study on livelihood analysis of *Irula* tribe of Attappadi reported that 78.00 per-cent of the respondents had medium family size consisting of five to seven members.

2.8.3 Educational Status

Sharma *et al.* (2010) in their study observed that among the participating households the proportion having lower primary qualifications was the highest while those having senior secondary qualification were the lowest.

Prabhu (2011) in his study on MGNREGP in Palakkad reported that regarding the educational status, majority, 54.44 per-cent of the respondents were illiterate and followed by (20.00 per-cent) middle level school.

Shincy (2012) in her study on livelihood analysis of *Irula* tribe of Attappadi reported that the educational status, 35 per-cent of them had only up to primary level.

Eighty two per-cent of them were illiterate and rest of them were having primary and middle school level of education (Anoop, 2013).

Sachana (2015) revealed that 80 per-cent of the tribal women were illiterate and only two per-cent of them were studied at college.

2.8.4 Average Monthly Income

Regarding annual income, nearly two-third (66 per-cent) of the respondents earn less than Rs. 30000, in which 32 per-cent of them earned Rs. 20000 as household income, which is below the poverty line (Kumaran, 2008).

Vijayanand and Jithendran (2008) reported that MGNREGP has suddenly increased the purchasing power of poor and there is visible local economic development and also lays foundation of livelihood security through hundred days wage employment.

Prabhu (2011) in his study on MGNREGP in Palakkad reported that regarding the annual income, 54.45 per-cent of the respondents earned income ranging between Rs.30001 and Rs.45000 followed by 41.11 per-cent in the income range between Rs. 15001 and Rs.30000.

Anoop (2013) in his study about *Paniya* tribe explained that majority of the respondents had an income ranging between Rs.2000-Rs.4000.

Sachana (2015) reported that only four per-cent of the tribals had monthly income below Rs.3000, 26 per-cent with an income in between Rs.3001-6000, the majority 58 per-cent with Rs.6001-9000 as their monthly income. Remaining nine per-cent of the tribespeople were having an income of range 9001-12000 and three per-cent with Rs.12001-15000 as their monthly income.

2.8.5 Land Holding

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 total number of land less and homeless population among the tribes in Kerala are 4614 and 8781 among these tribes Kattunayaka tribes consist of 317 and 587 (Prashanth 2016)

2.8.6 Alcoholism

American Psychological Association (2001) states that alcohol misuse and dependence are separate issues, but "even mild to moderate problems can cause substantial damage to individuals, their families and the community"

Loughhead *et al.* (2001) reported that to ensure all round development of the disadvantaged, reforming social deviants is essential with proper restriction of the production of alcohol and distribution of drugs in India, plus supporting rehabilitation centers with the aid of NGO's and others.

Shincy (2012) in her study on livelihood analysis of *Irula* tribe of Attappadi reported that 77.50 per-cent of the respondents were non users of alcohol even though it is a strong social menace among them.

Anoop (2013) in his study about *Paniya* tribe, was found that 77.00 per-cent of the respondents were daily users of alcohol.

According to Sachana (2015), among the total tribal women surveyed 33.00 per-cent were found to be using alcohol.

2.8.7 Access to Common Property Resources

Accessibility to a resource is determined either by legal status or by convention. If the community has a legal right of ownership or possession on the resource, it is clearly accessible to the community. Besides such legal rights, resources for which customarily accepted user rights exist are also treated as "accessible" to the community. (NSSO, 1999)

Shincy (2012) reported that tribal women in Attapadi had less access to common property resources.

2.8.8 Environmental Orientation

According to Joseph (2004) in the past, there were as little awareness about the importance of flora and fauna and their conservation in natural habitat. Since tribes and forest have two way relation, the development of tribes symbiotically lead to environmental enrichment.

Shincy (2012) in her study on livelihood analysis of *Irula* tribe of Attappadi reported that the environmental orientation, majority, 52.50 per-cent of the respondents had high level followed by 40.00 per-cent of them had medium level of orientation.

Regarding the environmental orientation, Anoop (2013) in his study about *Paniya* tribe reported that 89.00 per-cent of the respondents had high level of orientation.

Sachana (2015) reveals that 87.00 per-cent of the respondents had a high level of environmental orientation.

2.8.9 Political Orientation

Geetha (2002) found that 76.00 per-cent labourers of *thozhilsena* were having an opinion that political interference was one of the main hindering factors for the successful implementation of any new programmes.

According to Kumaran (2008), majority (79.00 per-cent) of the respondents had very high level of political orientation thinking that their development would occur only through political interventions

Shincy (2012) in her study on livelihood analysis of *Irula* tribe of Attappadi found that majority of the tribes people (65.00 per-cent) belonged to medium level of political orientation followed by high level (22.50 per-cent).

Among the total respondents 63.00 per-cent were highly political orientated and the remaining 37.00 per-cent were having a lower level of political orientation (Sachana, 2015)

2.8.10 Body Mass Index (BMI)

According to Srilakshmi (2003), body weight is most widely used to sensitive and simplest reproducible anthropometric measurements. It indicates the body mass and is a composite of all body constituents like water, mineral, fat portion and bone. It reflects more recent nutrition.

According to Gopaldas (2005), the extent of height deficit in relation to age as compared to region standard is regarded as a measure of the duration of malnutrition.

Sachana (2015) explained that only seven per-cent of them were coming under severely underweight, 30.00 per-cent of them were under weight, the majority 62.00 per-cent of them were with optimal weight and last the remaining one per-cent were overweight.

2.8.11 Cosmopoliteness

According to Preetha (1996) farmers those who had higher cosmopoliteness had a higher awareness of traditional knowledge.

Swapna (2003) reported that farmers with high level of cosmopoliteness had more knowledge about indigenous agricultural practices.

Less than a half of the farmer respondents (42.50 per-cent) in Dhoddballapur of Karnataka state had high level of cosmopoliteness (Swamy, 2012)

METHODOLOGY

3. METHODOLOGY

This chapter deals with the description of the methods and procedures adopted in conducting the present research study. The various aspects are furnished in this chapter under the following subheadings.

3.1 Research Design

3.2 Locale of the study

3.3 Selection of sample

3.4 Identification and documentation of indigenous agricultural practices

3.5 Operationalization and measurement of variables

3.6 Constraints faced by respondents

3.7 Methods used for data collection

3.8 Statistical tools used for the study

3.1 RESEARCH DESIGN

A research design is a fundamental plan for gathering the empirical data necessary to corroborate or refute the basic conceptual framework models or theories being investigated (Hoffer and Bygrave, 1992)

Ex-post facto design was employed in the present study. According to Singh (2006), an ex-post facto research is one in which the investigators attempt to trace an effect that has already occurred to its probable causes. It is a systematic empirical enquiry in which the scientist does not have direct control over the independent variables.

3.2 LOCALE OF THE STUDY

The study was conducted in Wayanad district of Kerala. This district has been purposively selected for the study because this is the district in Kerala having the highest concentration of tribespeople (37% of total Kerala's tribal population).

Plate 1. Map of Kerala showing the district of study

Plate 2. Map of Wayanad showing the panchayaths of study

3.2.1 Brief Description of the District

The district Wayand came into existence on 1st November, 1980 as the 12th district of Kerala, consisting of three taluks namely Mananthavady, Vythiri and Sultanbathery. The name Wayanad is derived from the malayalam words' *'Vayal Nadu'* which means the land of paddy fields. Wayanad, the green paradise is nestled among the mountains of the Western Ghats. The district is situated at a height between 700 meters and 2100 meters above the mean sea level. The district is bordered by the Karnataka state on the north, Tamilnadu state to east, Malappuram and Kozhikode districts' to the south and Kannur and Kozhikode districts' to the west with an area of 2,131. Sq.km. The district was carved out from the then Kozhikode and Kannur Districts. About 885.92.Sq.km of area is under forest in this district. The culture of Wayanad is mainly tribal oriented. Though considered as backward educationally and socially, this district is perhaps one of the biggest foreign exchange earners of the State, with its production of cash crops like pepper, cardamom, coffee, tea, spices and other condiments. Wayanad district comprises of three taluks, four blocks, one municipality, 49 revenue villages, one district panchayat, four block panchayats and 25 grama panchayats.

3.3 SELECTION OF SAMPLE

Mananthavady, Sulthan Bathery and Vythiri are the three taluks of Wayanad district. From each taluk one grama panchyath having highest tribal population was purposively selected. From each selected grama panchayath one *padashekaram* was selected. Twenty tribal agricultural labourers, twenty non-tribal agricultural labourers and ten farmers were selected randomly from the selected *padashekaram* for the study. Thus total of 150 (60 tribal agricultural labourers, 60 non-tribal agricultural labourers and 30 farmers) was the sample size of this study.

3.4 IDENTIFICATION AND DOCUMENTATION OF INDIGENOUS AGRICULTURAL PRACTICES.

Identification and documentation of indigenous agricultural practice in rice farming was done using structured focus group interviews. A group of farmers and labourers from each selected *padashekaharam* were chosen for the interview. The details from the focus group interviews were recorded and after consulting with expert farmers and scientists irrelevant and irrational practices were screened off. Thus a list of twenty indigenous practices were identified and documented for the study.

3.5 OPERATIONALIZATION AND MEASUREMENT OF VARIABLES

Based on the objectives, review of literature, discussions with experts and observations made by the researchers, the following dependent and independent variables were selected for the study.

Dependent variables

1. Scale of practice of indigenous agricultural practices.
2. Social participation.
3. Work participation among different operations.

Independent variables

1. Age
2. Family size
3. Educational status

4. Average monthly income

5. Land ownership

6. Alcoholism

7. Access to common property resources

8. Environmental orientation

9. Political orientation

10. Body Mass Index

11. Media utilization

12. Cosmopoliteness

3.5.1 Operationalization and Measurement of the Dependent Variables

3.5.1.1 Scale of Practice

It refers to the extent to which indigenous practices are used by the respondents in rice farming. An arbitrary measurement procedure was developed to study the scale of practice. The scoring procedure consists of two dimensions of scale of practice, *viz* awareness about the practices and its extent of use. The scale of practice was calculated by multiplying scores obtained for awareness and use of practice. Thus for each practice maximum score is 6 and minimum score is 1.

Sl. No.	Indigenous practices	Awareness		Use of practice		
		A	UA	U	PU	NU
1	Usually the bold grains in the panicle are used for the seed purpose (*thalamani*).					
2	Rice plants in the central region of the fields are used to obtain seeds.					

Abbreviation	Full form	Score
A	Aware	2
UA	Unaware	1
U	Using	3
PU	Partially using	2
NU	Not using	1

3.5.1.2 Social Participation

Refers to the participation of the respondents in various formal social institutions as well as in other social activities. A measurement scale developed by Sachana (2015) was followed to study social participation.

1.	Time spent for social activities
	On an average how much time do you spend for social activities (in hrs)?
2.	Leadership competency
	Where will you place yourself in the leadership continuum with regard to your leadership attributes? Very low low medium high very high 1 2 3 4 5
	How do you utilize your level of competency of leadership in the welfare of society? Most often often seldom rare very rare 5 4 3 2 1
3.	Prosocial behaviour (Prosocial behaviour can be operationally defined as involvement in desirable activities for the welfare of community and society)
	How frequently do you participate in social/community functions (marriage, funeral, festivals in temples, church etc.,) Most often often seldom rare very rare 5 4 3 2 1
	Do you think you have the ability to understand the problem of others? Most often often seldom rare very rare 5 4 3 2 1
	How often you intervene in resolving the problems of others? Most often often seldom rare very rare 5 4 3 2 1
4.	Involvement in public speaking skills
	Where will you place yourself in the public communication skill continuum with regard to your public speaking skill? Excellent good fair poor very poor 5 4 3 2 1 How often do you involve in public speaking? Most often often seldom rare very rare 5 4 3 2 1
5.	Interpersonal skills
	Where will you place yourself in the interpersonal communication skill continuum with regard to your capability in interpersonal communication as well as you in making interpersonal relationships? Excellent good fair poor very poor 5 4 3 2 1

3.5.1.3 Work Participation among Different Operations.

Work participation refers to the extent to which respondents' involvement in different operations in rice farming. A measurement procedure was developed to measure the work participation among different operations, by enlisting important operations in rice farming such as land preparation, nursery management, transplanting, intercultural operations, water management, harvesting and postharvest management. The extent of participation was measured by a five point continuum scoring from 5 to 1 for always, frequently, sometimes, seldom and never respectively.

Sl. No.	Operations	Extent of participation				
		Always	Frequently	sometimes	seldom	never
1	Land preparation					
2	Nursery management					
3	Transplanting					
4	Intercultural operations					
5	Water management					
6	Harvesting					
7	Post-harvest management					

3.5.2 Operationalization and Measurement of Independent Variables

3.5.2.1 Age

It refers to the number of calendar years completed by the respondents at the time of interview. This variable was measured directly by asking the respondent the number of years he/ she had completed at the time of investigation.

The age was classified based on Census report (2011). Distribution of respondents based on age is given below

3.5.2.2 Family Size

In the present study family size was measured by taking into consideration the specific number of members in the family of the respondents living together. The respondents were asked directly that how many members were there in their family.

3.5.2.3 Educational Status

Educational status was operationalised as the extent of formal learning possessed by the respondents who were above 21 years old at the time of interview. They were asked directly about their educational qualifications. Measurement procedure developed by Trivedi (1964) was used for the study with slight modification. The scoring procedure for educational status is represented below.

Sl. No.	Category	Score
1	Illiterate	1
2	Primary school	2
3	UP school	3
4	High school	4
5	Higher secondary	5
6	Graduation	6

3.5.2.4 Average Monthly Income

It is operationalized as the income obtained from the occupations both agriculture and other subsidiary occupations. They were asked directly about their average monthly income. The average monthly income was classified based on the range.

3.5.2.5 Size of Land Holding

Land holding refers to be in the actual land owned by the individual and have the control its resources for a secure living. Actual land in cents was recorded for the study at the time of interview.

3.5.2.6 Alcoholism

Alcoholism refers to the extent of consumption of alcohol by the respondents. Measurement schedule developed by Sachana (2015) was used for the study with slight modification. The respondents were asked directly whether he had a habit of consuming alcohol. The scoring procedure was developed in terms by multiplying the frequency of intake with level of intake was as follows.

A) Score for the frequency of intake

Daily	More than once in a week	Weekly	Monthly	Occasionally
5	4	3	2	1

B) Score for the level of intake

Very low	Low	Moderate	High	Very high
1	2	3	4	5

3.5.2.7 Access to Common Property Resources

Common property resources of the respondents were identified and rated based on his/her access, quality and current status and access to these resources were assessed according to the level of access or restrictions. A scoring procedure developed by Anoop (2013) was followed the measurement of access to common property resources.

Sl. No.	Common property resources	Access			
		UL/ UR	L/R	MR	HR
	Forest produce				
2	Water resources				
3	Common land resources				

The possible score ranged from 1 to 4.

Abbreviation	Access	Score
UL&UR	Unlimited and unrestricted	4
LR	Limited restricted	3
MR	Moderately restricted	2
HR	Highly restricted	1

3.5.2.8 Environmental Orientation

This was operationalized as the degree of concern the respondents have towards environment protection and conservation. The scale developed by Sreevalsan (1995) was used with some modifications. The scale consisted of five statements and the respondents were asked to state their response like strongly agree, agree, undecided, disagree and strongly disagree, to these statements scores ranged from five to one.

The responses were then summed up to obtain the environmental orientation score. Statements used for measuring the environmental orientation are given below.

Sl. No.	Statements	SA	A	UD	DA	SDA
1	Man is exploiting the earth too much					
2	Man has to be greatly concerned about environmental issues like deforestation.					
3	There is truth in what environmental activists claim and we should lend our support to them					
4	Do you agree that older methods of farming were more safer than present					
5	Intensive agricultural practices cause environmental hazards.					

SA: Strongly agree, **A:** Agree, **UD:** Undecided, **DA:** Disagree, **SDA:** Strongly disagree

Response	SA	A	UD	DA	SDA
Score for the statements	5	4	3	2	1

3.5.2.9 Political Orientation

Political orientation is operationally defined as the degree to which a person recognizes the power relations existing in the society and believes that democracy, distributive justice and political parties are relevant and important for resolving the problems of people in order to achieve the objective of people's sustainable development.

The scale developed by Kumaran (2008) was used for this study with slight modification.

It consisted of ten statements in which the responses were collected on a five point continuum viz. 'Strongly agree, Agree, Neutral, disagree' and 'Strongly disagree' with the scores of five to one respectively for positive statements and the scoring was reversed in the case of negative statements.

Sl. No.	Statements	SA	A	NE	DA	SDA
1	Recognizing power relations existing in the society is very important in resolving the problems of the society.					
2	Democracy is the best political principle and philosophy for ideal governance.					
3	Individual approach will not help in solving problems					
4	Organizing people for asserting their genuine and fundamental rights is an important pre-requisite for a democratic society.					
5	Political parties are inevitable and indispensable for a vibrant democratic society functioning in accordance with constitution.					
6	Sustainable progress and welfare of people can be achieved only through organized political and social interventions					
7	A political approach to social issues actually preserve the existing power relations and prevent distributive justice, social transformation and progress					

Table continues.

Sl. No.	Statements	SA	A	NE	DA	SDA
8	Political parties and other social organisations play no role in social development and therefore it is a curse to the society					
9	Principles like freedom, equality and fraternity should be the guiding cardinal principles of a strong civil society.					
10	Distributive justice makes a social system humane and modern.					

SA: Strongly agree, **A:** Agree, **NE:** Neutral, **DA:** Disagree, **SDA:** Strongly disagree

Response	SA	A	NE	DA	SDA
For positive statements	5	4	3	2	1
For negative statements	1	2	3	4	5

3.5.2.10 Body Mass Index

Body mass index is defined as the individual's body weight divided by the square of his or her height. The formulae universally used in medicine produce a unit of measure of kg/m^2.

Procedure adopted for anthropometric measurements:

Weight for age

For weighing platform weighing balance was used as it is portable and convenient to use in the field. The weighing scale was checked periodically for accuracy. The scale was adjusted to zero before each measurement. The subject was having minimum clothing and was asked to stand on the platform of the scale, without touching anything and looking straight ahead. The weight was recorded to the nearest 0.25 Kg. Each reading was taken twice to ensure correctness of the measurement.

Height for age

To determine height the anthropometric rod designed by the National Institute of Nutrition was used. The rod was placed perpendicular to the ground, taking care to see that the floor was even and not rough. The subject was asked to remove the slippers, stand with the center of the back touching the scale, with the feet parallel and heels, buttocks, shoulders and back of the head touching the rod. The head was held comfortably erect, the arms hanging loosely by the side. The ruler was held on the top of the head in the center, crushing the hair at right angle to the scale and the height read off from the lower edge of the ruler to the nearest 0.5 cm. Each reading was taken twice to ensure correctness of the measurement.

The current value settings are as follows: a BMI of less than 16.0 may indicate severely underweight, a BMI of 16.0 to 18.5 suggests the person is underweight, a BMI of 18.5 to 25 indicate optimal weight, a value from 25 to 30 suggests the person is overweight, obese class I value ranges from 30 to 35, Class II from 35 to 40 and a number above 40 suggests that the person falls in obese Class III.

Sl. No.	Category	Score range
1	Severely underweight	≤16
2	Under weight	16-18.5
3	Optimal weight	18.5-25
4	Over weight	25-30
5	Obese class I	30-35
6	Obese class II	35-40
7	Obese class III	>40

3.5.2.11 Media Utilization

It is operationally defined as the degree to which the respondent was exposed to various mass media channels. This was measured by the procedure followed and used by Prasidha (2006) with slight modifications. Scoring procedure for media utilization is given below.

Sl. No.	Source	R	O	S	R E
I.	Traditional media art forms like songs, dances and other performance in such societies are considered as traditional media				
II.	Print media (Newspapers, Magazines, Periodicals, Booklets, Brochures and Others.				

Table continues.

Sl:NO	Source	R	O	S	RE
III.	Electronic media a) Radio				
IV.	b) Television c) Mobile phones d) Internet based applications: Browsing, E-mail, Social Media, Recent advancements				

Scores for the media utilization

Abbreviation	R	O	S	RE
Response	**Regularly**	**Often**	**Seldom**	**Rare**
Score for statements	4	3	2	1

3.5.2.12 Cosmopoliteness

Cosmopoliteness is defined as the regular interaction with the urban premises as well as the social situations. The scoring procedure developed by Balachandran (1983) with slight modifications is used for the study.

a) Frequency of visit to nearest town	Score
Twice or more in a week	5
Once in a week	4
Once in a month	3
Seldom	2
Never	1
b) Purpose of visit	
All visits related to farming	4
Some visits related to farming	3
Other purposes	2
No purposes	1
c) Membership in organisation, outside the village	
Office bearer	3
Member	2
No membership	1

3.6 CONSTRAINTS FACED BY THE RESPONDENTS

Based on the discussion with respondents and also through relevant review of literature, constraints faced by the respondents were identified. The list was open ended so that the additional constraints expressed by the respondents were included at the time of interview. Constraints were ranked based on the frequency obtained. The constraint with maximum frequency was taken as most important constraint.

3.7 METHODS USED FOR DATA COLLECTION

An interview schedule including all aspects mentioned above was prepared. All the 150 respondents were contacted in their respective houses and rapport was established.

The questions were put in a conversational manner and responses were transcribed in the schedule itself. In case of responses, which were not clear, rechecking was done.

3.8 STATISTICAL TOOLS USED FOR THE STUDY

The data collected from the respondents were scored, tabulated and analyzed using suitable statistical methods. Keeping in view the objectives of the study and amenability the data were subjected to appropriate statistical tools. A brief description of the tools used is given below.

1. Krushkall Wallis test: Krushkall Wallis test is the non-parametric homologue of ANOVA this was done inorder to find the significant difference between groups.
2. Canonical correlation

The canonical correlation is a multivariate analysis of correlation. Canonical is a statistical tool for analyzing latent variables (which are not directly observed) that represent multiple variables (which are directly observed). Canonical correlation deals with the correlation between a pair of linear combination of set of dependent variables and independent variables namely canonical variables. The number of pairs of canonical variables is exactly the least number of variables either in the dependent set or in the independent set.

RESULTS AND DISCUSSIONS

4. RESULTS AND DISCUSSIONS

The findings of the study in line with the objectives set forth are presented here, with appropriate discussions, under the following titles.

4.1 Identification and documentation of indigenous agricultural practices.

4.2 Scale of practice of indigenous agricultural practices by tribal labourers, nontribal labourers and farmers.

4.3 Work participation among tribal labourers, non-tribal labourers and farmers.

4.4 Social participation of tribal labourers, non-tribal labourers and farmers.

4.5 Profile characteristics of tribal labourers, non-tribal labourers and farmers.

4.6 Canonical correlation analysis of variables of tribal labourers, non-tribal labourers and farmers.

4.7 Constraints faced by tribal labourers, non-tribal labourers and farmers.

4.1 IDENTIFICATION AND DOCUMENTATION OF INDIGENOUS AGRICULTURAL PRACTICES.

Wayanad is a district blessed with rice tracts. The cultural heritage of Wayanad is deeply interlinked with the rice farming. A number of indigenous agricultural practices with respect to rice farming are still prevalent in this district. In this study the indigenous practices were collected by structured focus group discussions with the respondents about the practices and referring to relevant literature. After consultation with experienced farmers and scientists, twenty indigenous agricultural practices were identified as important. The twenty important practices are detailed below.

1. Bold grains in the panicle (*thalamani*) are used for the seed purpose.

One method followed for collecting the *thalamani* is by allowing the bundles after harvesting to fall on a clean surface, thereby separating the bold

grains. Another method of collecting *thalamani* is by beating the harvested bundles with a stick or rod and then collecting the bold grains. Usually the *thalamani* will shatter easily. Another method widely used in Wayanad for seed collection is by throwing the grains horizontally at a diastance not exceeding 6-8 meters and the grains which fall near to the person who is throwing will be collected and used as seeds. These bold grains are used for seed purpose in the next season and they have high viability and high germination per-centage.

2. Rice plants in the central region of the field are selected for collecting seeds.

   In Wayanad, farmers usually sow different varieties in different plots of a *padashekharam*. Therefore to avoid mixing of different varieties, the plants from the centre most region are selected. The rice plants in the central region are usually free from mixing of varieties and therefore it is better to choose these plants.

3. Seedlings are planted in rows opposite to the direction of wind.

   Inorder to overcome the strong winds, seedlings are planted in rows opposite to the direction of wind. Lodging which is a serious problem during transplanting, can be avoided by this method. Preetha (1996) reported similar practice in the rice tracts of Thrissur, which is found to be a rational practice.

4. Clipping of the seedling's leaf tip prior to transplantation.

   The seedling tips are clipped off before transplantation. The reason behind this is to prevent lodging by wind and rain at the early stages of tall and medium duration varieties and to stimulate vigorous growth.

   Removal of seedling tip is a common practice because it also acts as a mechanical pest control method against rice stem borer which lays

eggs in the leaf tips, so removal of leaf tips disposes the egg mass off the stem borer.

5. Seeds are soaked in a mixture of cow dung and water after three days from the new moon day and these seeds are sown in the nursery after seven to eight days from the new moon day.

   For better germination, seeds are soaked in a mixture of water and cow dung, and then sown seven to eight days after the new moon day. For that the seeds are soaked three days before. Rivero-Romero *et.al* (2016) reported that transplanting after new moon day is to get better growth and for reducing the pest and disease incidence.

6. The transplanted seedlings were placed to a depth of one to three centimeters.

   As rice is a shallow rooted plant, nutrients are mostly available at a depth of 10-12cm. Since the major nutrients are easily available to plant at a depth of 2-5 cm, the planting of seedlings at one to three centimeters may enhance the growth of seedlings.

7. Avoiding *Punartham* and *pooyam njatuvela* while transplanting.

   Punartham and *pooyam najttuvela* are in the malayalam months of *Midhunam and Karkkidakam* during which there will be heavy rainfall and flooding in the rice fields. If transplanting is done in this period the seedlings might be spoiled.

8. *Thiruvathira njattuvela* is preferred for transplanting and *bharani njatuvela* is for sowing.

   Thiruvathira njattuvela is selected for the transplanting of seedlings of long duration varieties and broadcasting of seeds in case of short duration varieties. *Bharani njattuvela* is selected for broadcasting of long

duration varieties. Peculiarity of *thiruvathira njanttuvela* is the heavy rain which helps in the better germination and growth of seeds and seedlings.

9. The leaves of cheru (*Semecarpus anacardium*) is used to reduce acidity in the soil.

   Acidity is a grave problem in the rice fields of the Wayanad district. The traditional method to tackle this problem is, putting the leaves of *Semecarpus anacardium* (cheru) in the water streams of the field.

10. The branches of the sandpaper tree (*Ficus exasperata*) is widely used to control the leaf roller of the rice.

    This is a widely used method in Wayanad inorder to avoid leaf roller incidence in the rice field. Sandpaper tree is used to control leaf rollers in rice farming. The branches of this plant are swayed across the field which makes leaf rollers fall from the rice plants. It is the gritty nature of leaves which helps in the removal of pest from the plant.

11. Control of rice bug using the branches of Camphor tree (*Cinnamomum camphora*).

    Rice bug seemed to be an important pest in the olden days, as we can see from the old folk songs, sung during the transplanting. The branches of the camphor tree are widely used against the rice bug because the presence of euginol and other chemical compounds. These compounds initiates a smell which act as a feeding repellent for bugs. The branches are either swayed across the field or planted over the bunds of the field thus leading to preventing the bugs from feeding the rice plant especially during the milky stage.

12. Decayed fish wastes are used to repel the rice bugs.

    This is also an innovative idea widely used in the rice fields of Wayanad. In this decayed fish waste are used to repel the rice bugs. Usually the fish

wastes are scattered in the field and the bad odour from this may repel the bugs. Another benefit of this is to avoid elephant and deer attack in the field.

13. Screw pine (*Pandanus*) is planted near the rice fields to avoid pest incidence.

    Screw pine are planted on the bunds to reduce the pest incidence. Spiny leaves of the screw pine prevent pest attack by smearing the wings of the pests especially of the bugs. Besides of its advantages, presently only few farmers are practising this. Most of the farmers were aware, but they were not willing to adopt this practice. Moreover, the fruit of screw pine plant is used to kill cockroaches during the storage period as they get killed on eating the fruit.

14. Fire lamps are used in the night to reduce the pest incidence.

    It is one of the traditional methods, practiced all over Kerala. Fire lamps are posted on the bunds of the rice field which reduces the pest incidence at field level. Many farmers and labourers reported it as a good practice which yields good results.

15. *Muram* which is attached by a comb like structure is used to collect rice stem borers and leaf rollers in the early morning.

    Muram is a traditional winnowing device, to which a small comb like structure is attached and this device is used to collect the stem borers and leaf rollers from the field. Early morning they used to sway the *Muram* across the field. This will help to collect the larvae of the insect pests, thus controlling their infestation.

16. Leaves of the *paanal* plant (Glycosmis sp) are used to avoid pest infestation during storage.

Paanal plant is widely used as a pesticide from old days onwards. The leaves of paanal plant are placed inside the stored grains to get rid of the stored pests.

17. In short duration varieties *atham njanttuvela* is followed for transplanting, which helps to reduce the pest attack.

    If transplanting is done in atham *njanttuvela* i.e., during the Malayalam month of *vrischikam* and *dhanu*, the presence of mild wind during these months will help to reduce the pest attack and because of this reason farmers prefer to transplant rice during this period.

18. The leaves of eucalyptus, neem and camphor plants were used to avoid storage pest.

    Eucalyptus, Neem and camphor have been proved to have pesticidal property. By incorporating these leaves with the stored grains or the processed rice helps in reducing the storage pest attack.

19. Harvesting is usually done after 7-8 days from the new moon day.

    Usually farmers and labourers are ready to harvest their crop only after the new moon day inorder to reduce the pest infestation. They claimed that pest attack will be even more during the seven days before and seven days after the new moon day.

20. Seeds are dried under sun and at night for 7 days.

    As the seeds are to be used for the next generation, proper drying should be ensured. Therefore, the seeds are sun dried for seven days and seven days in the night too. A properly dried seed embryo will look like a small spot.

4.2 SCALE OF PRACTICE OF INDIGENOUS AGRICULTURAL PRACTICES

Table1. Percentage distribution of scale of adoption of indigenous agricultural practices of tribal labourers, non-tribal labourers, and farmers

Sl.No.	Indigenous Practices	Tribal Labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
		No.	%	No.	%	No.	%
1	Usually the bold grains in the panicle are used for the seed purpose (*thalamani*).	42	70	12	20	15	50
2	Rice plants in the central region of the fields are used to obtain seeds.	27	45	15	25	9	30
3	Seedlings are planted opposite to the direction of wind.	24	40	12	20	7	23
4	Clipping of the seedling's leaf tips prior to transplantation.	48	80	16	27	27	90
5	Seeds are soaked in a mixture of cow dung and water, after three days from the new moon day and these seeds were sown in the nursery after 7-8 days from the new moon day.	27	45	39	65	15	50
6	The transplanted seedlings were placed to a depth of 1-3 cm.	51	85	30	50	10	33.5
7	Avoiding *punartahm* and *poooyam njattuvela* while transplanting.	27	45	27	45	10	33.5
8	*Thiruvathira njattuvela* is widely used for transplanting and *bharani njatuvela* is used for sowing.	21	35	30	50	16	53
9	The leaves of cheru (*Semecarpus anacardium*) is used to reduce acidity related issues in the field.	39	65	10	17	5	17
10	The branches of the sandpaper tree (Ficus *exasperata*) is widely used to control the leaf roller of the rice.	42	75	18	30	7	23

Table 1. Continues.

Sl.No	Indigenous practice	No.	%	No.	%	No.	%
11	The branches of Camphor tree (*Cinnamomum camphora*) is used to control rice bug.	18	30	6	10	15	50
12	Decayed fish wastes are used to repel the rice bugs	42	70	12	20	16	53
13	Screw pine (*Pandanus*) is planted near to rice field to avoid the pest incidence.	49	82	15	25	25	83.5
14	Fire lamps are used in the night time to reduce the pest incidence.	33	55	18	30	11	37
15	*Muram* which is attached by comb like structure is used to collect the rice stem borers in the early morning.	36	60	12	20	24	80
16	Leaves of the *paanal* plant (Glycosmis sp) is used to avoid pest during storage period.	24	40	12	20	15	50
17	In short duration varieties *atham njanttuvela* is followed for transplanting, which helps to reduce the pest attack.	18	30	9	15	18	60
18	The leaves of eucalyptus, neem and camphor plants were used to avoid storage pest.	21	35	12	20	15	50
19	Harvesting is usually done after 7-8 days from the new moon day.	60	100	60	100	30	**100**
20	Seeds are dried in sunshine and at night for 7 days.	60	100	60	100	30	**100**

** Multiple responses

On analysing Table 1. it could be clearly seen that 100 per-cent respondents of three groups had been adopting the practices like "harvesting is usually done after 7-8 days from the new moon day" and "seeds are dried in sunshine and at night for 7 days".

Regarding the adoption of indigenous agricultural practices by tribal labourers, 85.00 per-cent of them adopted indigenous agricultural practice number 6 (The transplanted seedlings were placed to a depth of one to three centimeters.),

82.00 per-cent adopted practice number 12 (Decayed fish wastes are used to repel the rice bugs), 80.00 per-cent adopted practice number 4 (Clipping of the seedling's leaf tips prior to transplantation.), and 75.00 per-cent adopted practice number 10 (The branches of the sandpaper tree (*Ficus exasperata*) is widely used to control the leaf roller of the rice.)

On the other hand in non-tribal labourers, about two third of them (65.00 per-cent) is using the practice "the soaking of seeds in a mixture of cow dung and water, after three days from the new moon day" and "sowing of these seeds in the nursery after 7-8 days from the new moon day". They also adopted the practice of planting of transplanted seedlings at a depth of 1-3 cm and on *Thiruvathira* and *bharani njatuvela* transplanting was carried over.

Table 1 itself reveals that traditional knowledge or indigenous agricultural practices are usually followed by farmers. Moreover the scale of practice of indigenous practices are high among them. Majority of them were following almost all the indigenous practices.

Scale of practice score of these groups was determined by multiplying the score of awareness by score for use of practice. The scale of practice score of three groups (tribal labourers, non-tribal labourers, and farmers) ranges from 20 to 120 and it was grouped into 5 groups namely very low (20-40), low (40-60), medium (60-80), high (80-100), and very high (100-120). The results are presented in Table 2.

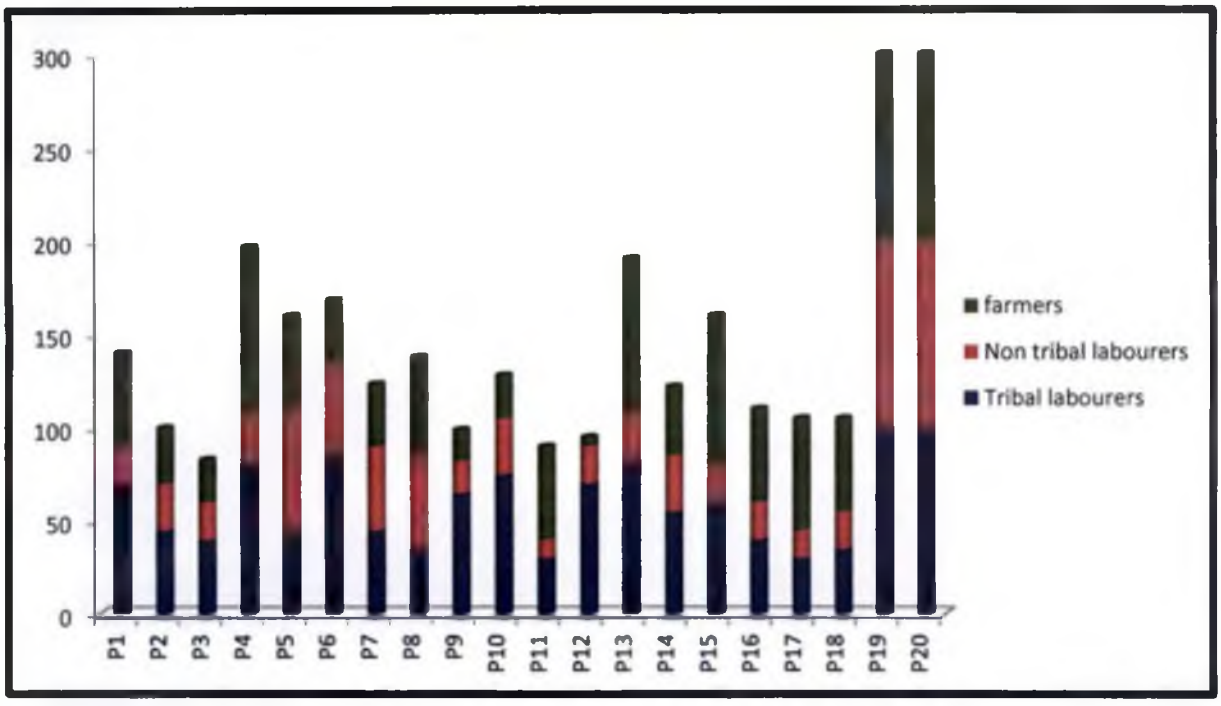

Figure 1.Comparative analysis of adopting indigenous agricultural practices by tribal labourers, non-tribal labourers, and farmers.

Table 2. Scale of practice of indigenous agricultural practices among three groups (N=150)

Category	Score Range	Tribal labourers (n=60)		Nontribal Labourers (n=60)		Farmers (n=30	
		No.	%	No.	%	No.	%
Very Low	20-40	0	0	25	41	2	7
Low	40-60	23	38	28	47	4	13
Medium	60-80	35	59	6	10	5	17
High	80-100	2	3	1	2	12	40
Very high	100-120	0	0	0	0	7	23
Average score		62.5(91.46)		45.45(40.08)		79.95(114.36)	

Kruskal Wallis = 72.035 (p=0.0001)

CD (.05) for 60, 60 = 18.989, CD (.05) for 60, 30 = 23.256

(CD - critical difference)

The Table 2 clearly shows that three fifth (59 per-cent) of the tribal labourers were having medium scale of practice of IAP, 39 per-cent of them had low scale of practice and three per-cent of them had high scale of practice. In the case of non-tribal labourers most of them (47.00 per-cent) had low scale of practice, 41.00 per-cent of them had very low scale of practice, 10.00 per-cent of them had medium scale of practice and only two per-cent of them had high scale of practice.

Whereas 40.00 per-cent of the farmers had high scale of practice, 23.00 per-cent of them had very high scale of practice, 17.00 per-cent of them had medium scale of practice, 13.00 per-cent of them had low scale of practice, and only seven per-cent of them had very low scale of practice.

While comparing the average scores of scale of practice of indigenous agricultural practices between three groups it could be clearly seen there was significant difference between the average scores i.e., between the tribal labourers and non-tribal labourers, non-tribal labourers and farmers and between tribal labourers and farmers.

The farmers were had high average score for scale of practice as compared to other two groups, whereas a comparison of tribal and non-tribal labourers showed a high score for tribal labourers.

The tribal as well as non-tribal labourers were working based on the instructions received from the farmers. Moreover, during the focus group interviews more traditional practices were quoted by farmers than any other groups. Tribal people may be knowing various traditional knowledge but they were reluctant to disclose and express.

Reasons for this is historical in the sense that tribespeople were the labourers of *jenmies* and other land owning classes since the time immemorial. A typical slavery system similar to that of Europe and America existed in Wayanad also. Till recent past *valliyoor kavu* temple festival was the venue for the buying and selling of tribal labourers for a period of one year, tribal labourers were like slaves and were circumscribed to move out other than labour activities.

The accumulated indigenous wisdom and experience in rice farming contributed to the high score for scale of practice of the tribal labourers. This result is in line with many studies around the globe. WIPO (2014) reported that Aboriginals are the repertoire of indigenous knowledge and traditional practices.

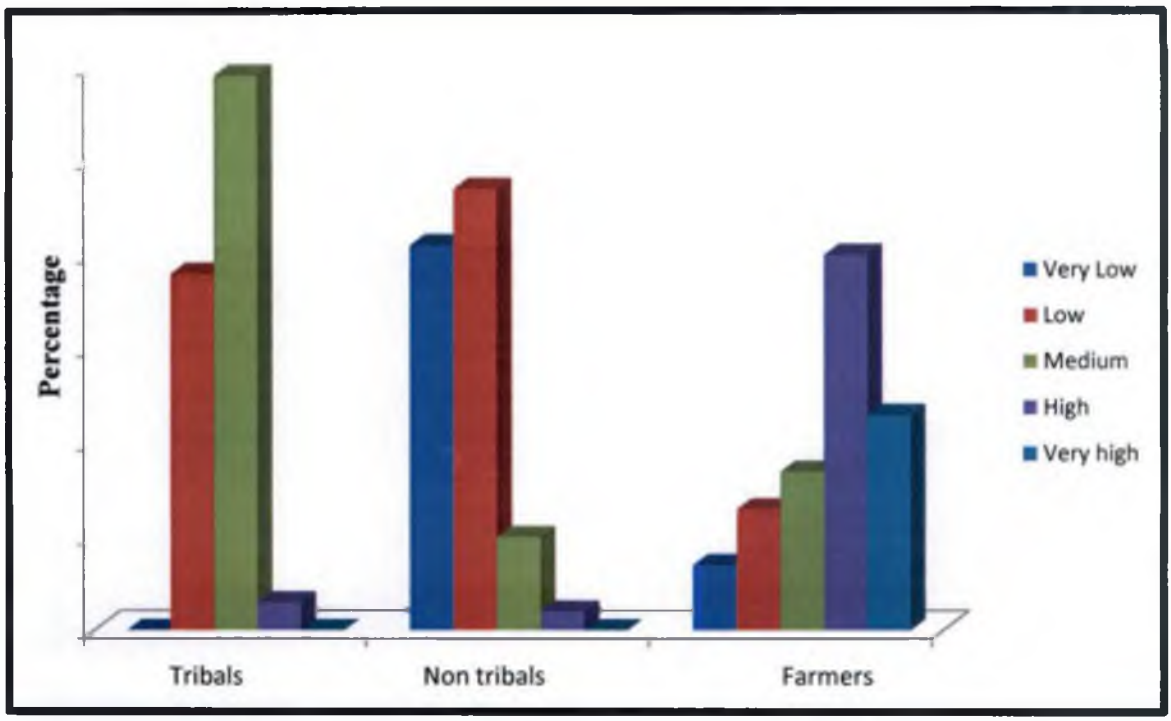

Figure 2. Distribution of respondents based on scale of practice

4.3 WORK PARTICIPATION

Table 3. Percentage distribution of work participation score of different operations of rice farming among three groups

(N=150)

Operations	Tribal labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
	No.	%	No.	%	No.	%
Land preparation	56	93	54	90	24	80
Nursery management	54	90	58	96	15	50
Transplantation	42	70	24	40	6	20
Intercultural Operations	49	81	48	80	16	53
Water management	37	61	35	58	27	90
Harvesting	55	91	48	80	20	67
Postharvest Management	42	70	40	66	27	90

** Multiple resopnses

While examining Table 3. it can be clearly understood that the tribal labourers participation in various operations of rice farming was higher compared to other two categories, especially in land preparation (93.00 per-cent), nursery management (90.00 per-cent), transplantation(70.00 per-cent)), intercultural operations(81.00 per-cent), Harvesting (91.00 per-cent), and postharvest management (70.00 per-cent). Whereas the non-tribal labourers had a higher participation in operations like land preparation (90.00 per-cent), nursery management (96.00 per-cent), intercultural operations (80.00 per-cent), and harvesting (80.00 per-cent). Farmers had high participation in operations like land preparation (80.00 per-cent), water management (90.00 per-cent), and post-harvest management (90.00 per-cent).

Based on the score of statement in interview schedule total work participation score was estimated and classified into low (7-21) and high (21-35) for three groups and the results are presented in Table 4.

Table 4. Average Work participation score of tribal labourers, nontribal labourer, and farmers.

(N=150)

Category	Score Range	Tribal labourers (n=60)		Non -Tribal labourers (n=60)		Farmers (n=30)	
		No.	%	No.	%	No.	%
Low	7 to 21	17	28	26	43	20	67
High	21-35	43	72	34	57	10	33
Average score		21.66(88.31)		21 (74.9)		18.66(51.03)	

Kruskal Wallis = 14.956 (p= 0.0006)

CD(.05) for 60,60 = 18.989, CD(.05) for 60,30 = 23.256

(CD- critical difference)

A perusal of the Table reveals that majority (72.00 per-cent) of the tribal labouers had high work participation and only 28.00 per-cent of them had low work participation. The non-tribal labourers showed the same trend of work participation of about 57.00 per-cent and 43.00 per-cent of them had high and low work participation respectively. In the case of farmers majority of them had low work participation (67.00 per-cent) and only 33.00 per-cent of them had high work participation.

By comparing the average work participation score among three groups it could be distinctly seen that there was significant difference between tribal labourers and farmers as well as between non-tribal labourers and farmers. But the average score was on par with respect to tribal labourers and non-tribal labourers. Though there is no significant difference between tribal and non-tribal labourers with regard to work participation, tribal labourers showed a higher level

of work participation compared to non-tribal labourers. This result was on par with the findings of Goswami et al. (2006).

According to the Goswami et al. the work participation of tribal women is higher than the non-tribal population in the same geo-climatic and agro-economic conditions prevailing in the Dhemaji district of Assam. Therefore, it can be inferred that work participation is more among tribal population than the nontribal population.

The reasons for high preference of tribal labourers than non-tribal labourers by farmers is because of rich experience in rice farming possessed them and they are less assertive in demanding higher wages in consideration with hike in commodity prices.

Work participation of famers was very less as compared to tribal and nontribal labourers, it is quite logical that they employ labourers to work in their fields rather than working themselves. They participate in work only when there is no other alternatives or due to compellation of circumstances. .

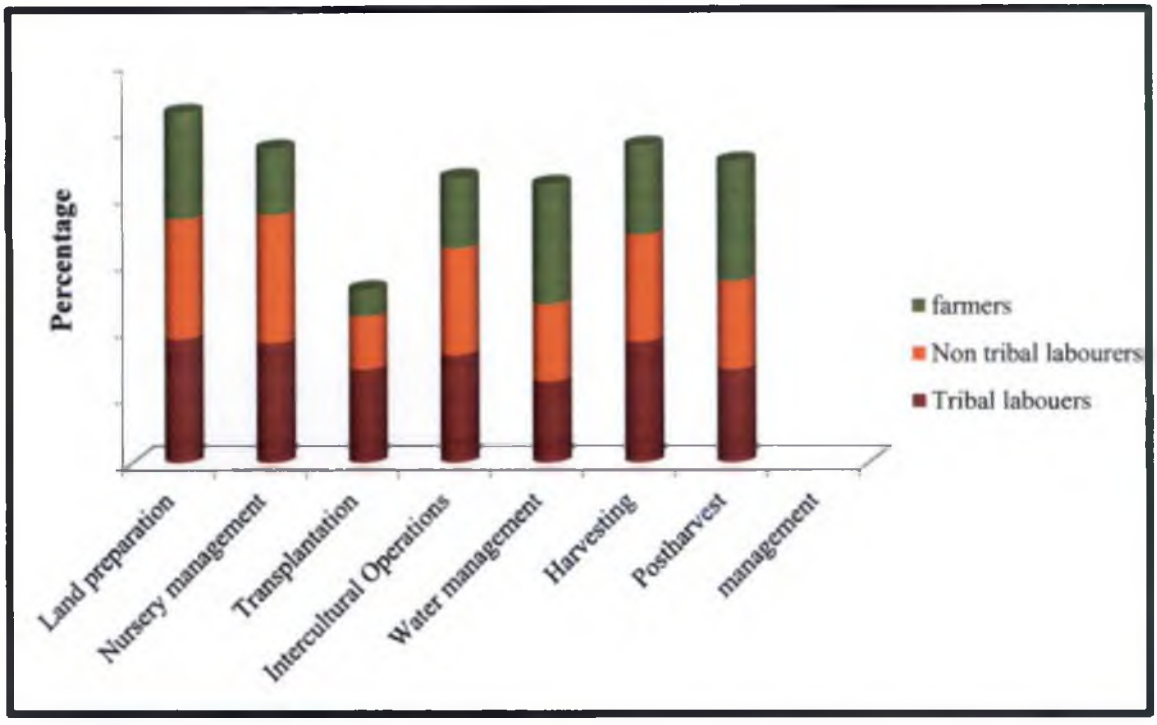

Figure 3. Comparative analysis of work participation in different operations of rice farming among three groups.

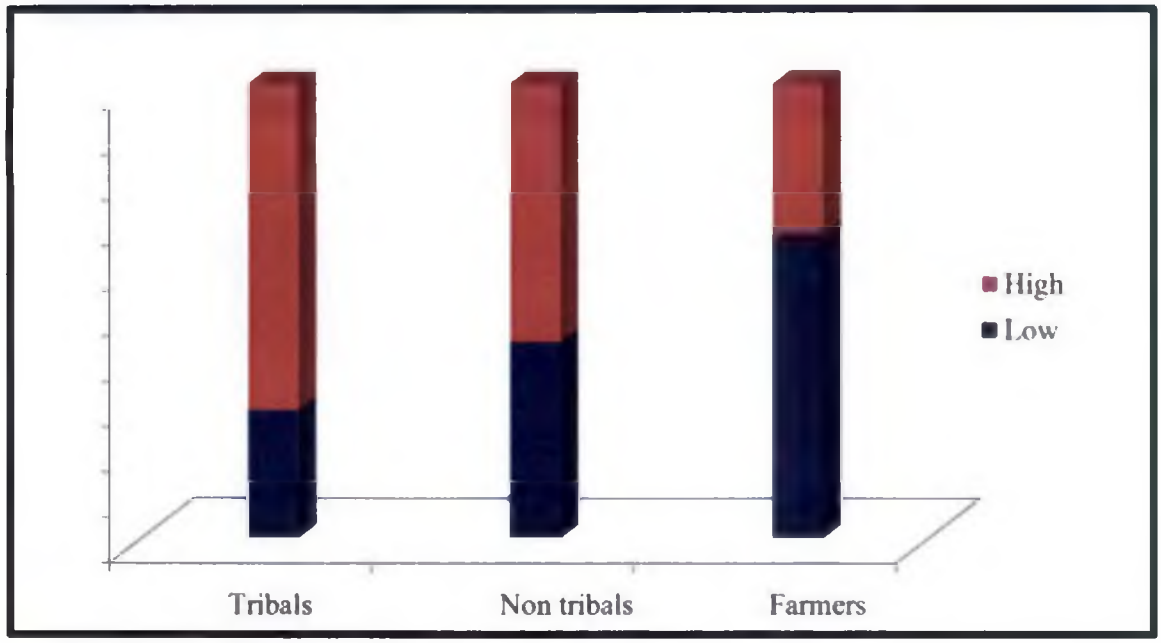

Figure 4.Distribution of respondents based on work participation

4.4 SOCIAL PARTICIPATION

Table 5. Social participation among three groups

(N=150)

Sl. No	Category	Score range	Tribal labourers (n=60		Non-tribal labourers (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1.	Very low	7- <14	42	70	0	0	0	0
2	Low	14 - <21	0	0	0	0	1	3
3.	Medium	21 - <28	8	13	0	0	12	40
4.	High	28 - <35	10	17	58	97	17	57
5.	Very high	>35	0	0	2	3	0	0
	Average score		14.78(37.63)		31.15(110.95)		27.3(80.33)	

Kruskal Wallis = 72.035 (p=0.0001)

CD (.05) for 60, 60 = 18.989, CD (.05) for 60, 30 = 23.256

(CD- critical difference)

While looking at the Table 5. it clearly reveals that 70.00 per-cent of tribal labourers had very low social participation, 13.00 per-cent of them had medium level of social participation and only 17.00 per-cent of them had high level of social participation.

While coming to non-tribal labourers 97.00 per-cent of them had high social participation and three per-cent of them had very high social participation. About 57.00 per-cent of the farmers indicated a high social participation, 40.00 per-cent of them with medium social participation and only three per-cent of them had low level of social participation.

A comparison of the average score of social participation among three groups such as tribal labourers, non-tribal labourers and farmers it can be seen that there was significant difference between tribal labourers and non-tribal labourers, likewise there was significant difference between tribal labourers and farmers and also between non-tribal labourers and farmers.

Tribal labourers had less social participation as compared to other two groups. The core reasons behind it was, historically they are most exploited, subjugated, and ostracized community in the society. Even 70 years after independence the situation is not different even in Kerala also. The pathetic plight of tribespeople are is being reported in various media. So, the discrimination faced by them contributed in creating a mindset of skepticism and fear of all people outside their socio cultural situations. Usually they are reluctant to open up and mingle with non-tribal people, therefore all these historical facts can be attributed to the formation of negative attitude towards no-tribal people. The discrimination and cultural invasion by non-tribal peoples also lowered the level of social participation of tribal labourers. They wanted to protect themselves against the different types of encroachments which also includes, the so called prescriptive development interventions by government and NGOs. The result is on par with the findings of Sachna (2015).

There was significant difference between the average score between farmers and nontribal labourers with regard to their social participation. The reasons might be that non-tribal being a less privileged group compared to farmers and they were more organized under different political and social organisations.

It is generally observed that interactional involvement in social activities are more with lower socio-economic categories. Pro-social behaviour of farmers was comparatively higher than tribal labourers but lower than non-tribal labourers.

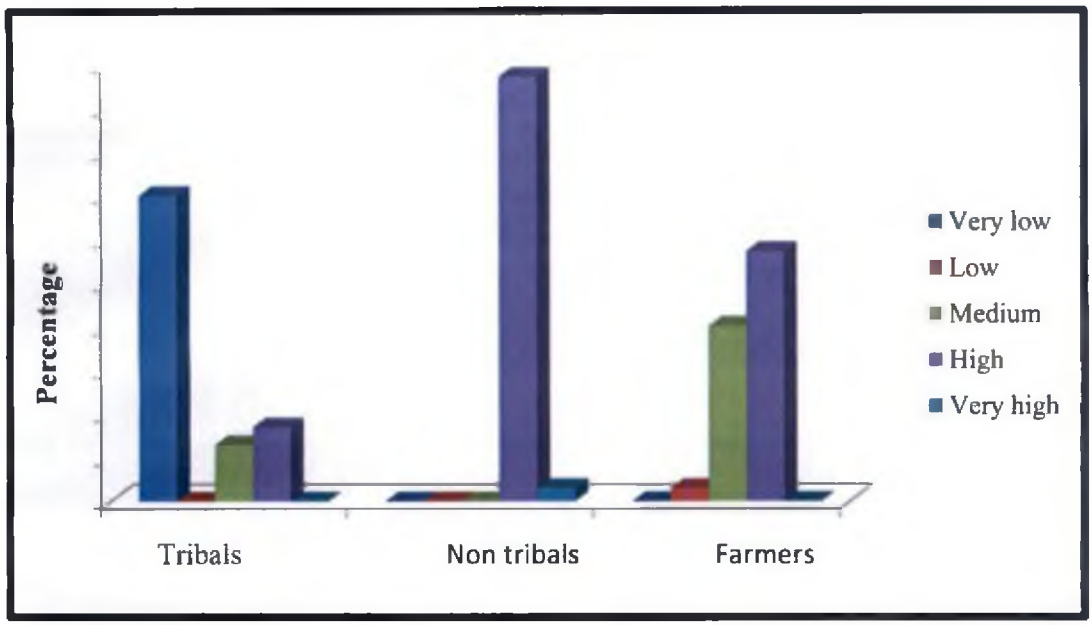

Figure 5. Distribution of respondents based on social participation

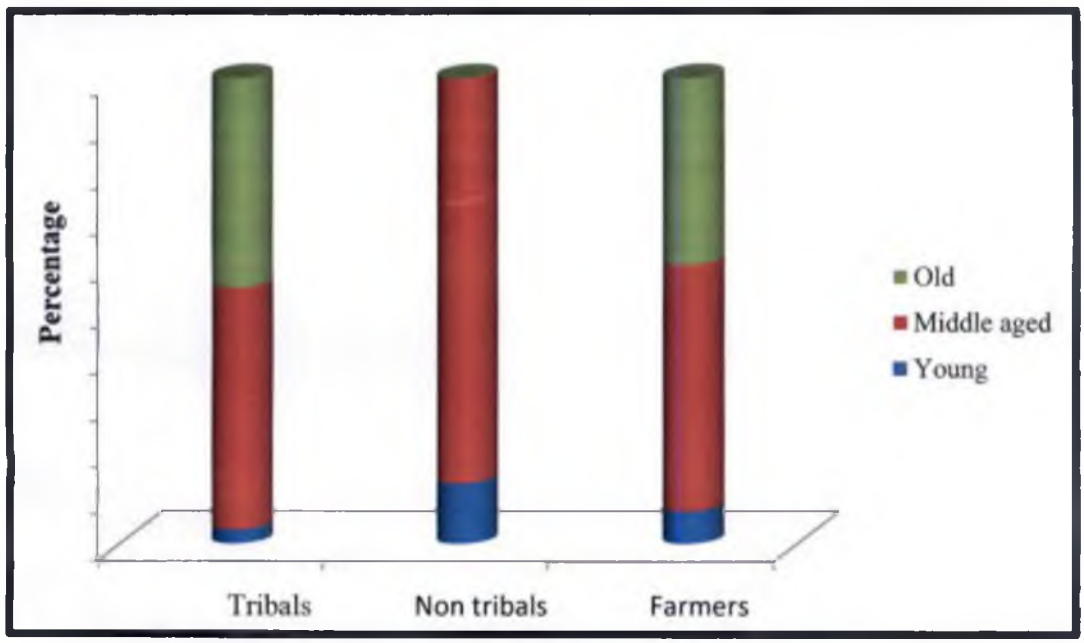

Figure 6.Distribution of respondents based on age

4.5 PROFILE CHARACTERISTICS OF THE RESPONDENTS

It includes the distribution of tribal labourers, non-tribal labourers and farmers with respect to different profile characteristics and discussions relevant to those characteristics.

The variables studied under profile characteristics were age, educational status, family size, monthly income, land holding, environmental orientation, political orientation, media utilization, alcoholism, cosmopoliteness, access to common property resources, and BMI.

4.5.1 Age

Table 6. Distribution of respondents based on age

(N=150)

Sl. No.	Category	Score range	Tribals (n=60)		Nontribals (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1	Young	<35	2	3	8	13	2	7
2	Middle aged	35-55	31	52	52	87	16	53
3	Old	>55	27	45	0	0	12	40

From the Table 6. it can be observed that a more than half of tribal people (52.00 per-cent) were from the middle age group followed by 45.00 per-cent from the old age category and only three per-cent of the tribal respondents belonged to young age group.

Whereas in the case of non-tribal labourers most of the respondents (87.00 per-cent) belonged to the middle age category and 13.00 per-cent of the labourers were from young age group. None of the non-tribal labourers were observed under old age category.

In case of farmers more than half (53.00 per-cent) of the respondents belonged to middle age category and 40.00 per-cent belonged to old age group and only seven per-cent of the farmer respondents comes under young age category.

In the case of tribal labourers most of the women respondents belonged to the old age category. The reason is that majority of the young labourers are reluctant to involve in rice farming works and the middle age group had higher participation in rice farming. Both the middle aged and old age categories consider rice farming as their cultural responsibility rather than a means of income.

While in the case of the non-tribal labourers the rice farming seems to be bit less attractive due to the drudgery involved and also due to low relatively low income from rice farming. It is the middle and old aged farmers who contribute a major share of rice farming in Wayanad district in case of farmers. The serious implications of this finding is that, in the near future nobody will be willing to involve in rice farming unless serious interventions are made to resolve this issue by the government.

4.5.2 Educational Status

Table 7. Distribution of respondents based on educational status.

(N=150)

Sl. No.	Category	Tribals(n=60)		Non-tribals (n=60)		Farmers (n=30)	
		No.	%	No.	No.	No.	%
1	Illiterate	36	60	0	0	0	0
2	Primary school	7	12	12	20	5	17
3	Upper primary	15	25	35	58	12	40
4	High school	2	3	13	22	4	13
5	Higher secondary	0	0	0	0	5	17
6	Graduation	0	0	0	0	4	13

The Table7. showed the distribution of the respondents according to their educational qualification.

The table reveals the most important fact about tribals that 60.00 per-cent of them were illiterate, 25.00 per-cent of them had completed mid school and 12.00 per-cent of them were educated upto primary school. None of them had higher secondary and graduation level education.

In the case of non-tribal labourers more than half of the respondents (58.00 per-cent) had obtained upper primary school education followed by high school level acquired by 22.00 per-cent and 20.00 per-cent of the labourers had completed primary school education. Therefore most of the non-tribal labourers had medium level of education but none of them was educated upto the level of higher secondary and graduation and none of them was illiterate.

It could be seen that 40.00 per-cent of the farmers had upper primary school level education 17.00 per-cent were educated upto primary school and higher secondary level and 13.00 per-cent of the farmers completed high school and graduation level. None of the farmer respondents came under illiterate category.

There are many schemes implemented by the Government of Kerala for the upliftment of tribal people. Even then majority of the tribal labourers seems to be illiterate especially the *katunaika, paniya and adiya* tribal groups. The reason may be the colloquial slang of these groups which is far different from the Malayalam making it difficult for them to follow what is being taught in the Malayalam language. The projects and programmes did not take into account their socio-cultural reality which hinder the learning process. The government projects and programmes usually follows a prescriptive approach which do not take into account the aspiration and problems of tribal people and consequently the big budget programmes would end up as failure. The usual tendency is to blame the target categories as lethargic and demotivated.

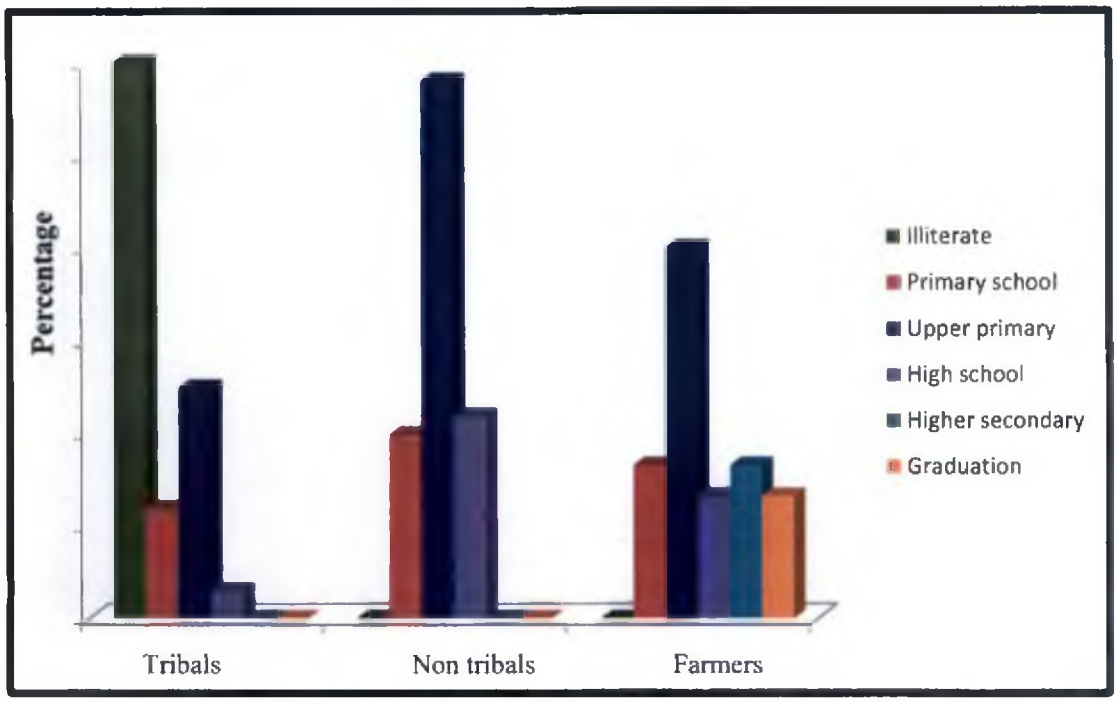

Figure 7. Distribution of respondents based on educational status

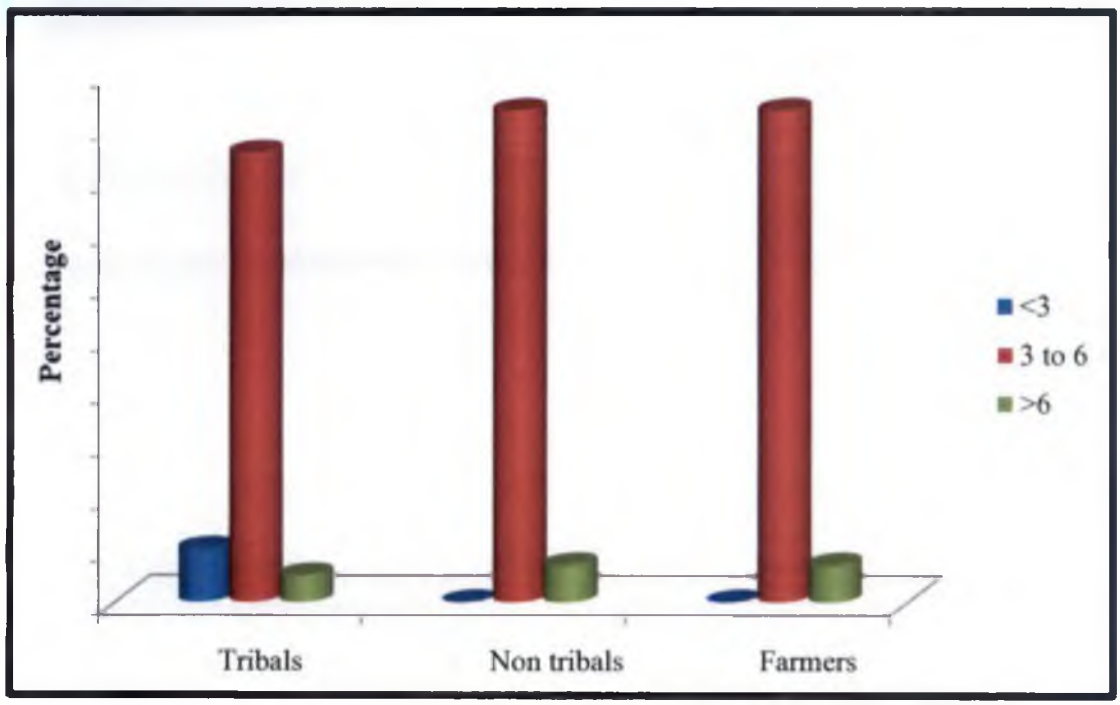

Figure 8. Distribution of respondents based on members in the family

By formulating programmes according to the needs and wants, only which will contribute to intensive growth.

Model interventions like *thaikulasangam* in Attapadi should be implemented in Wayanad inorder to educate the underprivileged categories and make them reach main stream of the society. Government should frame a separate curriculums indorder to educate the tribespeople and make them to get better exposures from the society. This might help them to overcome the exploitation faced by them.

4.5.3 Family Size

Table 8. Distribution of respondents based on family size

(N=150)

Sl. No.	Members in the family	Tribal Labourers (n=60)		Non-tribal Labourers (n=60)		Farmers (n=30)	
		No.	%	No.	%	No.	%
1	<3	6	10	0	0	0	0
2	3-6	51	85	56	93	28	93
3	>6	3	5	4	7	2	7
Average		3.9 (55.21)		4.9 (92.28)		4.6 (82.5)	

Kruskal Wallis = 112.114 (p=0.0001)

CD (.05) for 60, 60 = 18.989, CD (.05) for 60, 30 = 23.256

(CD- critical difference)

A perusal of the Table reveals that, the majority of the tribal labourers (85.00 per-cent), Nontribal laourers (93.00 per-cent) and farmers (93.00 per-cent) had three to six members in their family.

In the case of tribal labourers 10.00 per-cent of the families had less than three members and remaining five per-cent of the tribal labourers belonged to a family with more than 6 members.

In the case of nontribal labourers and farmers seven per-cent of the families came under the category of more than 6 members in their family.

While comparing the average score of the family size among three groups we can clearly see that there is significant difference between tribal labourers and farmers as well as between tribal labourers and non-tribal labourers. But the average score between farmers and nontribal labourers are on par.

The above finding clearly shows a drastic reduction in the family size of tribal labourers. Mortality rate among the tribal labourers seems to be very high and their life expectancy seems to be very low compared to others. Addiction to chronic alcoholism and chewing tobacco are main reasons for the high mortality rate among tribal labourers, therefore, a concerted and tribal focused health education programmes are to be implemented at the earliest.

4.5.4 Monthly Income

Table 9. Distribution of respondents based on monthly income

(N=150)

Sl. No.	Category	Tribal labourers (n=60)		Non-tribal Labourers (n=60)		Farmers (n=30)	
		No.	%	No.	%	No.	%
1	Low	34	56	0	0	0	0
2	Medium	25	42	54	90	13	17
3	High	1	2	6	10	17	83
Average		112.19(43.15)		162.20(86.18)		199.50(118.83)	

Kurskal Wallis : 66.740 (P=0.0001)

CD (.05) for 60, 60: 18.989, CD (.05) for 60, 30: 23.256

(CD- critical difference)

A glance of the Table 9. reveals the distribution of respondents based on monthly income.

Compared to non-tribal labourers and farmers, 56.00 per-cent and 42.00 per-cent of the tribal labourers received low and medium level of income respectively and only two per-cent of the tribals were getting high monthly income. In the case of non-tribal labourers 90.00 per-cent of them had medium level of income and remaining 10.00 per-cent were coming under high income category.

It was observed from the table that 83.00 per-cent of the farmers were getting high level of income followed by 17.00 per-cent in medium income category. None of the non-tribal labourers and farmers were coming under low income category.

While comparing the average of monthly income between the three groups it can be clearly seen that there was significant difference between the tribal labourers and non-tribal labourers as well as between tribal labourers and farmers. By looking at the nontribals and farmers also it can be seen that there was significant difference in the average monthly income.

The monthly income of tribal labourers seems to be low compared to non-tribal labourers and farmers, and this result was on par with the findings of Sachna (2015) and Anoop (2013).

Tribal labourers are least paid compared as to the non-tribal labourers. Among the tribal labourers the women labourers are the least paid. The main reson for this is that they are less assertive in demanding the wages and also due to mechanization the working days have been drastically reduced which directly reflected on their income.

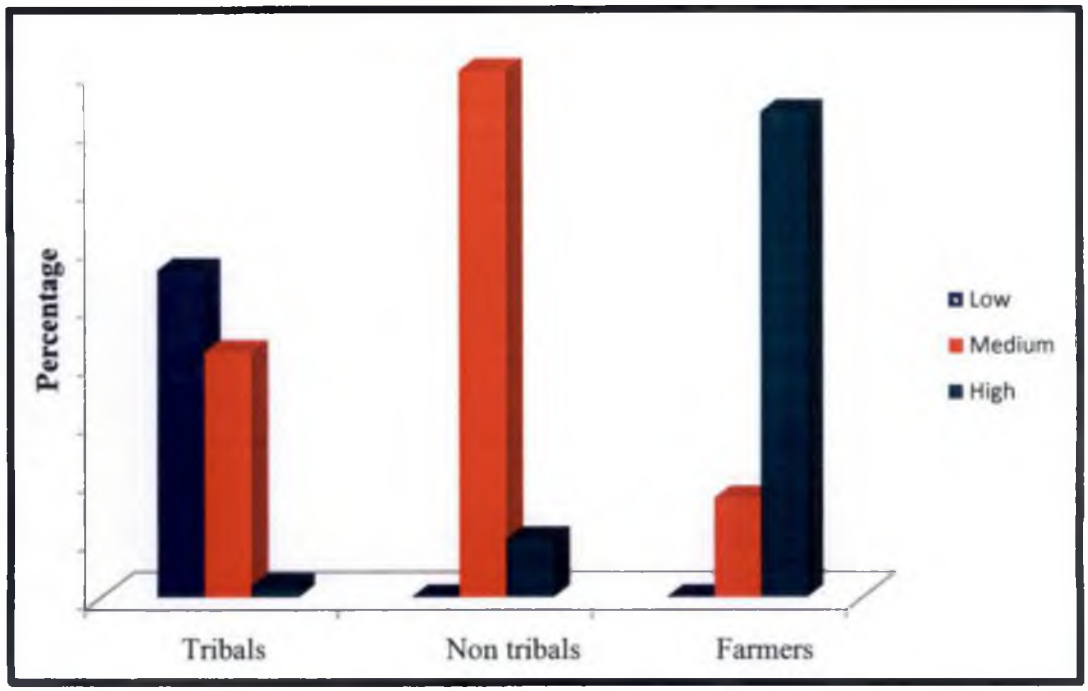

Figure 9. Distribution of respondents based on monthly income

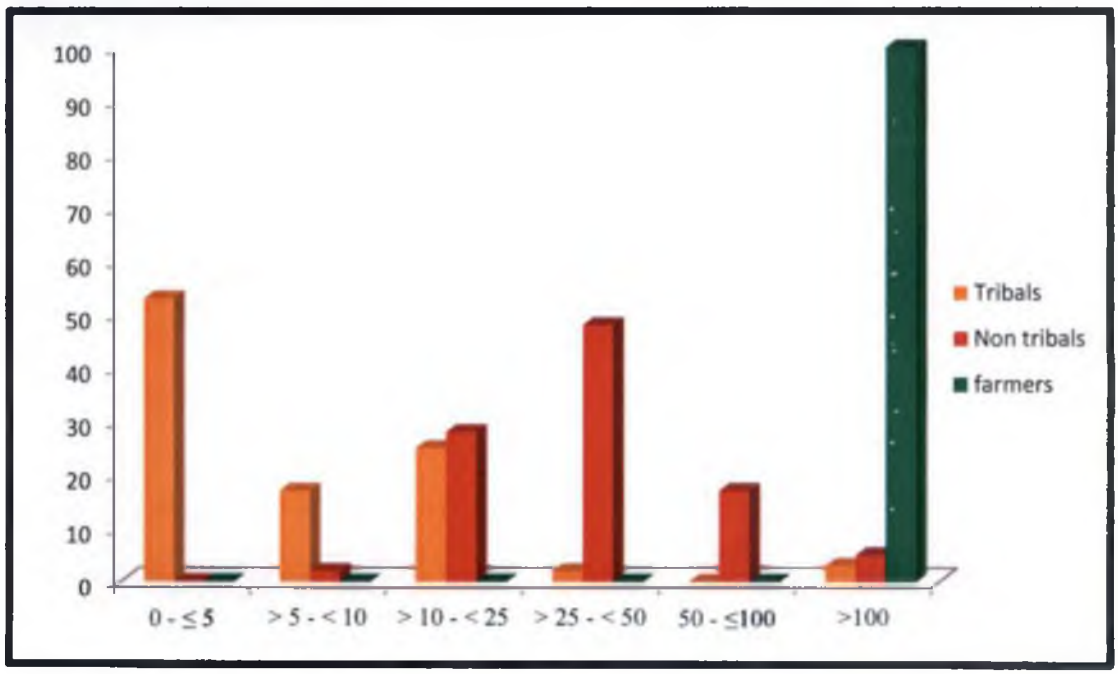

Figure 10. Distribution of respondents based on land ownership

Nowadays most of the farmers are showing reluctance towards rice farming due to the economic loss, which also resulted in the reduction of the monthly income. As a consequent to this most of the tribal women labourers rely on MGNREGA for the works. Along with this rice is a seasonal crop, after the rice season most them find difficult to find income. Whereas the non-tribal manages to find some other jobs during off seasons.

Farmers are claiming that rice cultivation is an uneconomic activity due to labour shortage, high cost of production, marketing problems etc., even though most of them are getting good price for traditional varieties such as *jeerakashala* and *gandhakashala* none of them are interested to do rice farming.

4.5.5 Land Ownership

Table 10. Distribution of respondents based on size of land holding.

(N=150)

Sl. No.	In cents	Tribal labourers (n=60)		Non-tribals labourers (n=60)		Farmers (n=30)	
		No.	%	No.	%	No.	%
1	0 - ≤ 5	32	**53**	0	0	0	0
2	> 5 - < 10	10	17	1	2	0	0
3	> 10 - < 25	15	25	17	28	0	0
4	> 25 - < 50	1	2	29	**48**	0	0
5	50 - ≤100	0	0	10	17	0	0
6	>100	2	3	3	5	30	**100**
Average		13.12(34.65)		43.81(86.71)		266.33(134.71)	

Kruskal Wallis = 113.104 (p=0.0001)

CD(.05) for 60,60 = 18.989, CD(.05) for 60,30 = 23.256

(CD- critical difference)

The Table 10. reveals the true picture of land holding of Wayanad's tribal people, that more than 50.00 per-cent of the tribal labourers' possessed land less than or equal to five cents of land and 25.00 per-cent of them owned greater than10 cents to less than 25 cents. 17.00 per-cent owned land of about greater than five cents but less than 10 cents and only two per-cent of the respondents and greater than five cents to less than 10 cents, respectively. Only three per-cent of the tribal labourers possessed more than 100 cents.

In the case of non-tribal labourers, it is clear from the table that majority of the respondents possessed more than 10 cents of land. 48.00 per-cent of them owned more than 25 cents to less than 50 cents and 28.00 per-cent of them had more than 10 cents to less than 25 cents of land. 17.00 per-cent of the non-tribal labourers owned more than 50 cents to less than or equal to 100 cents. Two per-cent of the non-tribal labourers owned more than five cents to less than 10 cents respectively and none of them were having less than five cents of area.

On observing the farmers based on land ownership it was evident that cent per-cent of the farmers possessed more than 100 cents of land.

While comparing the average landholding among the three group it can be seen that there was significant difference between these groups, i.e. the farmers have more area compared to other groups and nontribal labourers have more land holding than tribal labourers.

Even though the tribals were the natives of Wayanad but now they are the most ostracized category in Wayanad. The consequent migration of settler farmers initially from Kozhikode and Malappuram of Malabar region and later from Central Travancore region in the first and second half of twentieth century resulted in the drastic change of land holding pattern of this district over the years. The invasion by the settler farmers during the different periods of the twentieth century by different strategic means occupied the fertile cultivable lands and consequently tribal people were relegated into the fringes of the society. Only the *kurichaya* and *kuruma* communities had land holding more than 100 cents.

4.5.6 Alcoholism

Table 11. Distribution of respondents based on alcohol use

(N=150)

Sl. No	Category	Tribal labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
		No.	%	No.	%	No.	%
1	Users	42	70	41	68	9	30
2	Teetotalers	18	30	19	32	21	70
	Total	60	100	60	100	30	100

The Table 11 shows the alcohol consumption statistics of tribal labourers, non-tribal labourers and farmers. It is clear from the Table that 70 per-cent of the tribal labourers and 68 per-cent of the non-tribal labourers were found to be using alcohol. In the case of farmers 70 per-cent of them were teetotalers and 30 per-cent of them consumes alcohol.

Table 12. Alcoholism among three groups (Users).

Category	Score range	Tribal labourers (n=42)		Nontribal labourers (n=41)		Farmers (n=9)	
		No.	%	No.	%	No.	%
Very low	1 - <5	17	41	22	54	5	56
Low	5 - <9	1	2	7	17	2	22
Medium	9 - <13	0	0	4	10	1	11
High	13 -17	3	7	8	19	0	0
Very high	>17	21	50	0	0	1	11
Average score		8.48 (85.15)		4.65 (78.33)		1.9(50.51)	

Kruskal Wallis = 14.077 (p=0.0009)

CD (.05) for 60, 60 = 18.989, CD (.05) for 60, 30 = 23.256

(CD- critical difference)

Upon scrutinizing the Table 12. it was found that 50.00 per-cent of the tribal labourers had very high consumption of alcohol followed by 41.00 per-cent had very low, seven per-cent high consumption, and two per-cent had low alcohol consumption. Compared to tribal labourers and non-tribal labourers (54.00 per-cent), farmers (56.00 per-cent) were found to consume very less amount of alcohol. In the case of non-tribal labourers 19.00 per-cent had high level of consumption, 17.00 per-cent had low consumption level and 10.00 per-cent comes under medium consumption category. None of the non-tribal labourers were consuming very high amount of alcohol.

It was observed from the table that 22.00 per-cent of the farmers were having low consumption of alcohol and only 11.00 per-cent were consuming it in very high level. None of the farmer respondents were coming under high consumption category.

While comparing the average scores of alcoholism among the three groups it can be clearly seen that there was significant difference between tribal labourers and farmers as well as between non-tribal labourers and farmers. But the average score of alcoholism is on par between tribal labourers and non-tribal labourers. The result synchronised with the findings of Anoop (2013) and Sachana (2015) regarding the high level of alcohol consumption among the tribal people.

Alcohol addiction is a perennial issue adversely affecting human health and behaviour. Most of the male tribal labourers were addicted to alcoholism and consequent to this they had a low life expectancy. Major share of their income is expended for alcohol and tobacco.

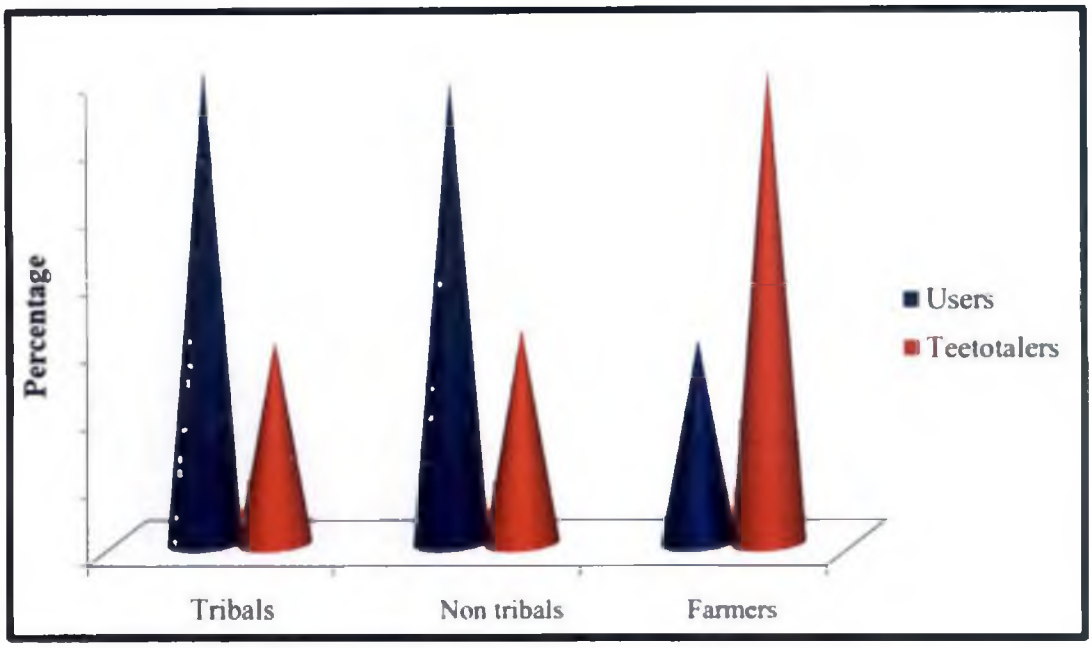

Figure 11. Distribution of respondents based on alcohol use

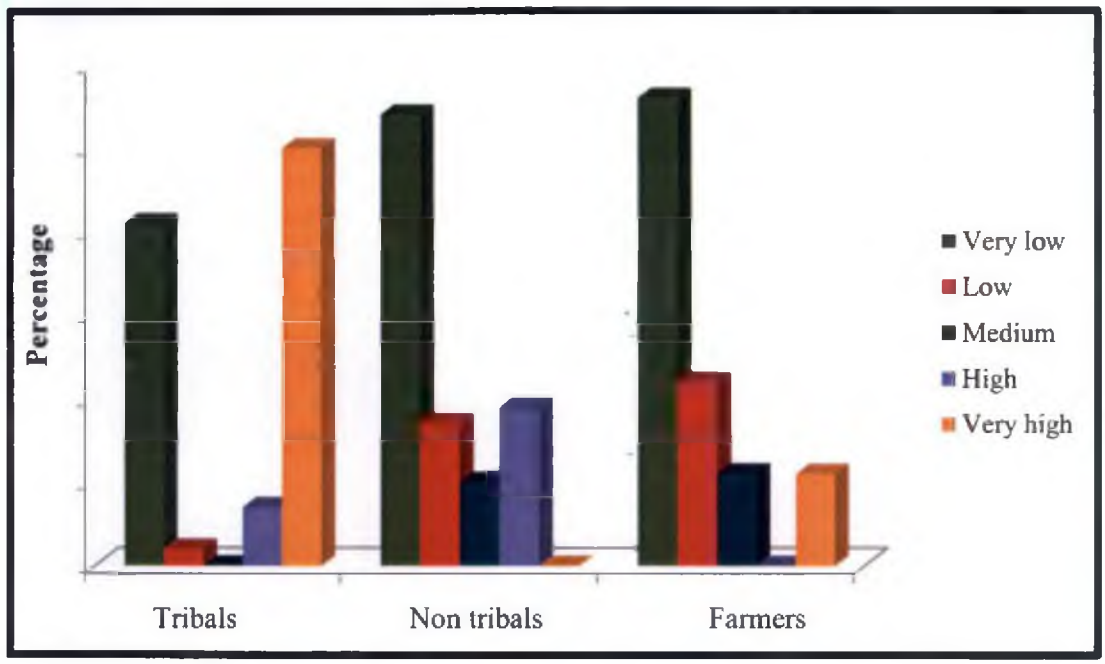

Figure 12. Distribution of respondents based on alcoholism

It was interesting to observe that tribal labourers prefer liquor than daily wages in farm operations. So this is being used to woo and exploit tribespeople both male and female.

The heavy alcoholic behaviour leads to the early death of tribal people in their younger ages. If this situation continues extinction of certain tribal communities in Wayanad is not too far.

4.5.7 Access to Common Property Resources

Table 13. Distribution of respondents based on access to common property resources.

(N=150)

Sl. No.	Category	Score range	Tribal labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1.	Low	4 to 8	16	27	3	5	0	0
2.	Medium	8 to 12	44	73	57	95	29	97
3.	High	12 to 16	0	0	0	0	1	3
Average			9 (73.36)		9.03 (71.55)		9.56(87.65)	

Kruskal Wallis = 3.303 (p=0.1918)

No Significant difference

It is evident from the Table 13 that 73 per-cent of the tribal labourers had medium level access to common property resources followed by 27.00 per-cent with less access. Majority of the non-tribal labourers (95.00 per-cent) and farmers (97.00 per-cent) had medium level access to different common property resources and none of the tribal and non-tribal respondents were having high access to different common resources.

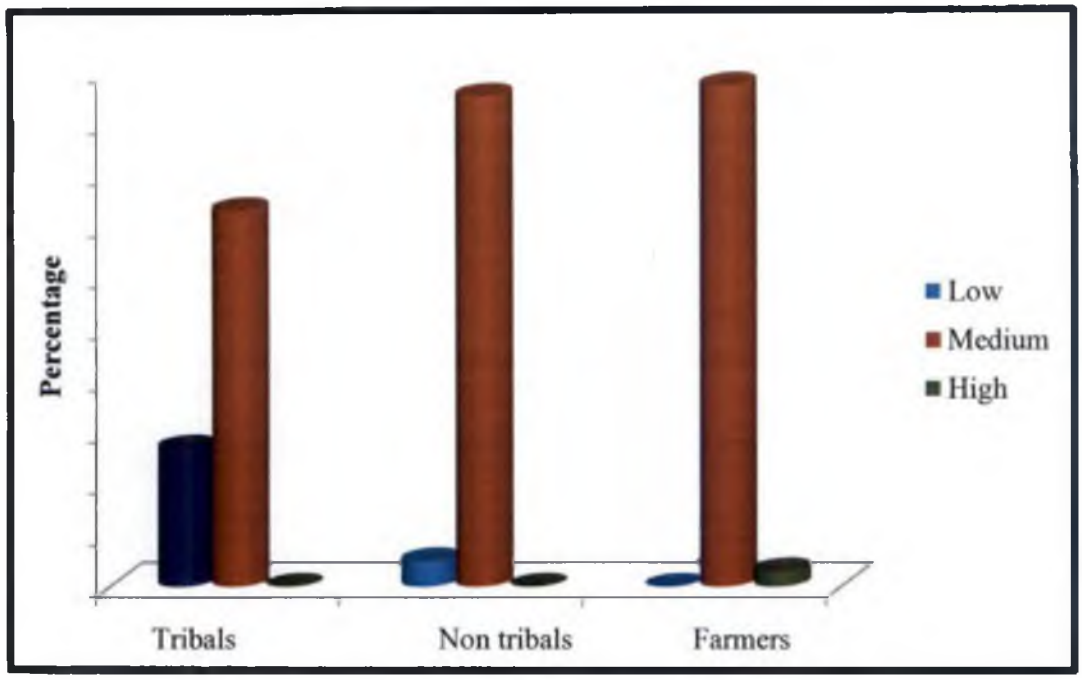

Figure 13. Distribution of respondents based on access to common property resources

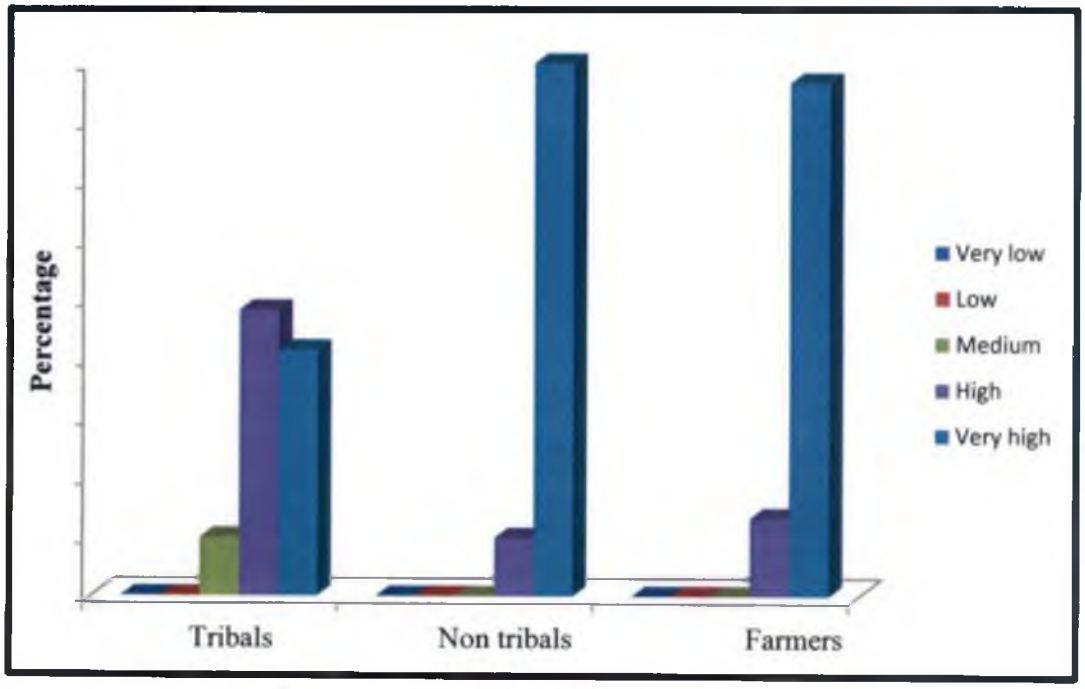

Figure 14. Distribution of respondents based on environmental orientation

Five per-cent of the non-tribal labourers had less access and only three per-cent of the farmers had high access to common property resources.

Since the probability (p) value is greater than five per-cent so there was no significant difference between the three groups.

This clearly reveals that the tribal labourers too had the similar access to the common property resources. It is a paradox that the access to common property resources' average score was high for the farmers followed by the non-tribal labourers, and the underprivileged tribal groups had less access compared to other two groups. The real conservers had less access and others had more.

4.5.8 Environmental Orientation

Table 14. Distribution of respondents based on environmental orientation.

(N=150)

Sl. No.	Score Range	Category	Tribal Labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1	5 – 9	Very low	0	0	0	0	0	0
2	9 -13	Low	0	0	0	0	0	0
3	13 – 17	Medium	6	10	0	0	0	0
4	17 – 21	High	29	48	6	10	4	13
5	21-25	Very high	25	42	54	90	26	87
		Average score	21.08(44.22)		24.25(99.37)		23.76(90.3)	

Kruskal Wallis = 55.742 (p=0.0001)

CD (.05) for 60, 60 = 18.989, CD (.05) for 60, 30 = 23.256

(CD- critical difference)

It should be evident from the Table 14 that, compared to tribal labourers majority of the non-tribal labourers (90.00 per-cent) and farmers (87.00 per-cent) had very high level of environmental orientation and only ten per-cent of the non-tribal labourers and 13.00 per-cent of the farmers had high concern about their environment.

Observing tribal labourers distribution, 48.00 per-cent of the respondents had high environmental orientation followed by 42.00 per-cent with very high level and 10.00 per-cent of them had medium level of environmental orientation.

While comparing the environmental orientation among the three groups' it can be seen that there was significant difference between the tribal labourers and non-tribal labourers as well as between tribal labourers and farmers. But the average score between non-tribal labourers and farmers are on par.

Tribal people are more inclined towards the forest and its life, but the scores of environmental orientation depicted that the tribal labourers had the least score compared to the other two groups. They worship nature as goddess and they were much concerned about the changes in the environmental conditions and climate change prevailing in the world. Tribespeople all-round the globe are the people protecting natural resources and forests. They generally do not exploit the natural resources in the name of development. They have been following what their forefathers followed in the past, though not knowing the scientific rationale of the relevance and importance of environment conservation. But the non-tribal people especially the rich in the name of development cleared the forests and exploited resources without any restraint.

The consequences of overuse of chemicals and rampant deforestation lead to a state of environmental degradation and pollution. This situation forced people to think of the importance of environmental conservation. This might be the reason for non-tribal labourers and farmers had showed high level of environmental orientation.

4.5.9 Political Orientation

Table 15. Distribution of respondents based on political orientation

(N=150)

Sl. No.	Category	Score range	Tribal labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1	Very low	10 -18	0	0	0	0	0	0
2	Low	18 – 26	23	**38**	0	0	0	0
3	Medium	26 – 34	19	32	0	0	1	3
4	High	34 – 42	6	10	**49**	**82**	21	**70**
5	Very high	42 – 50	12	20	11	18	8	27
Average score			30.95(52.81)		39.11(91.43)		38.73(89)	

Kruskal Wallis = 55.742 (p=0.0001) (CD- critical difference)

CD (.05) for 60, 60 = 18.989, CD (.05) for 60, 30 = 23.256

Analysis of Table 15 reveals the distribution of respondents based on political orientation. It is observed from the Table that 38.00 per-cent of the tribal labourers had low level of political orientation, 32.00 per-cent with medium level, 10.00 per-cent with high political orientation and 20.00 per-cent of them with very high political orientation. The result was on par with the findings of Sachana (2015).

Observing non-tribal labourers distribution, majority of the respondents (82.00 per-cent) had high level of political orientation followed by 18 per-cent with very high level of orientation.

In the case of farmers, most of the respondents (70.00 per-cent) had high political orientation and 27.00 per-cent were having very high orientation and 3 per-cent were with medium level of political orientation.

While comparing the average score of political orientation among the three groups' it can be seen that there was significant difference between the tribal labourers and non-tribal labourers as well as between tribal labourers and farmers. But the average score between non-tribal labourers and farmers was on par.

Tribal people were generally illiterate and less aware of the political situations in the society in which they are living. The established political parties are just using them as vote banks while denying the privileges and rights eligible for a person as a citizen of this country. Moreover they are interested in gratifying their day today needs and wants without exhibiting the attribute of deferred gratification, this might be the reason for their low work participation. Whereas the farmers and non-tribal labourers are more organized under different political organisations and so, compared to the tribal labourers they had more political orientation.

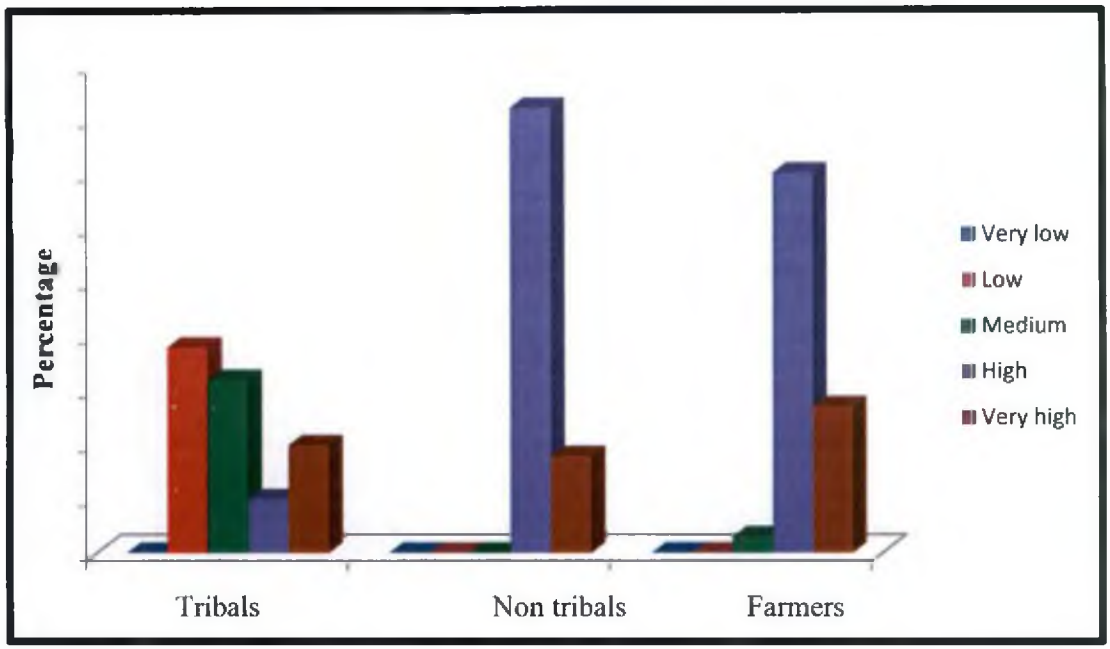

Figure 15. Distribution of respondents based on political orientation

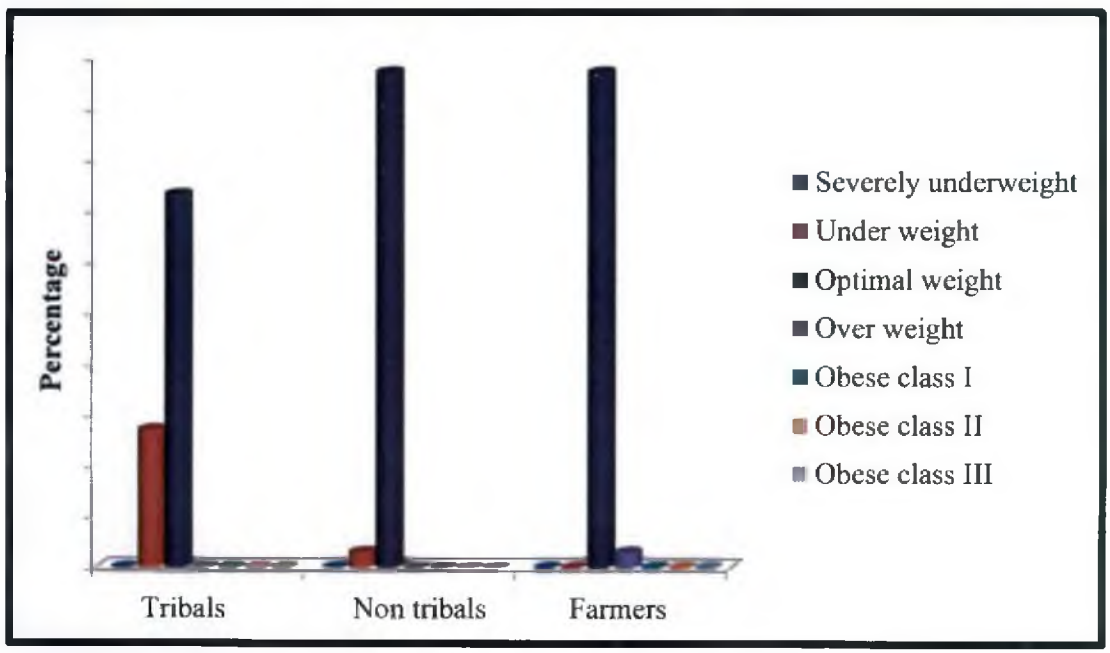

Figure 16. Distribution of respondents based on Body Mass Index (BMI)

4.5.10 Body Mass Index (BMI)

Table 16. Distribution of respondents based on BMI

(N=150)

Sl. No.	Category	Score range	Tribal labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1.	Severely underweight	≤16	0	0	0	0	0	0
2.	Under weight	16-18.5	16	27	2	3	0	0
3.	Optimal weight	18.5-25	44	73	58	97	29	97
4.	Over weight	25-30	0	0	0	0	1	3
5.	Obese class I	30-35	0	0	0	0	0	0
6.	Obese class II	35-40	0	0	0	0	0	0
7.	Obese class III	>40	0	0	0	0	0	0
Average			20.49(51.12)		22.47(82.11)		23.50(111.01)	

Kurskal Wallis : 40.330 (P=0.0001)

CD(.05) for 60,60 : 18.989,CD(.05) for 60,30 : 23.256

(CD: critical difference)

A perusal of the Table 16 shows the distribution of three groups of respondents based on their Body Mass Index (BMI). It can be inferred from the Table that majority of the tribal labourers (73.00 per-cent), non-tribal labourers (97.00 per-cent) and farmers (97.00 per-cent) were with optimal body weight. In the case of tribal labourers 27.00 per-cent of them were underweight.

On observing the distribution of non-tribal labourers and farmers based on BMI, it was clear that three per-cent of the non-tribals and farmers were under weight and overweight respectively.

None of the respondents were coming under the categories like severely underweight, obese class I, obese class II and obese class III.

While comparing the average body mass index among three groups it can be seen that there was significant difference among the groups, i.e. the farmers had high BMI compared to other two groups and non-tribal labourers had high BMI than tribal labourers.

Few tribal women were underweight while most of the tribal labourers (men and women) were having optimal weight. This indicates the nutrition programmes implemented by the government is showing good results in Wayanad. When compared to other tribal settlements in Kerala, Wayanad is certainly in a better position.

4.5.11 Media Utilization.

Table 17. Distribution of respondents based on media utilization

(N=150)

Sl. No.	Category	Score Range	Tribal labourers (n=60)		Non-tribal Labourers (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1.	Low	4 to 8	42	70	0	0	1	3
2.	Medium	8 to 12	12	20	56	93	20	67
3.	High	12 to 16	6	10	4	7	9	30
Average			5.95(47.71)		9.23(85.37)		10.8(111.3)	

Kurskal Wallis : 49.802 P=0.0001

CD(.05) for 60,60 : 18.989,CD(.05) for 60,30 : 23.256

(CD: critical diffrence)

It could be apparent from the Table 17. that majority of the tribal labourers (70.00 per-cent) had less media utilization followed by 20.00 per-cent with medium utilization and 10.00 per-cent of the tribal respondents had high utilization of different mass media to get the required information. Majority of the non-tribal labourers (93.00 per-cent) had a medium media utilization and only seven per-cent of them had high media utilization. Whereas 67.00 per-cent of the farmers had medium media utilization, 30.00 per-cent of the farmers had high media utilization, and only three per-cent of them had low media utilization.

By comparing the average score among three groups we can clearly see that there is significant difference between the three groups in the case of media utilization in their day to day lives.

The major cause of low media utilization by the tribal labourers is due to the lack of education. Most of them are illiterate. The news and reports in various media didn't make any sense to them. Their transactions and activities are confined to their own community, national and global affairs are not all a concern to them. Their concern is always on their subsistence and sustenance of livelihood. The result is on par with the findings of Mathiayzhagan et.al. (2007), the report says that tribespeople tend to believe in interpersonal as compared to other modes of communication. Whereas the non-tribal labourers had medium media utilization, most of them were literate and they possessed a high level of social participation, environmental orientation etc., which consequently builds a good media exposure and utilization.

Majority of the farmers had medium and high media utilization. The reason might be most of them relay on various medias to know the price pattern of

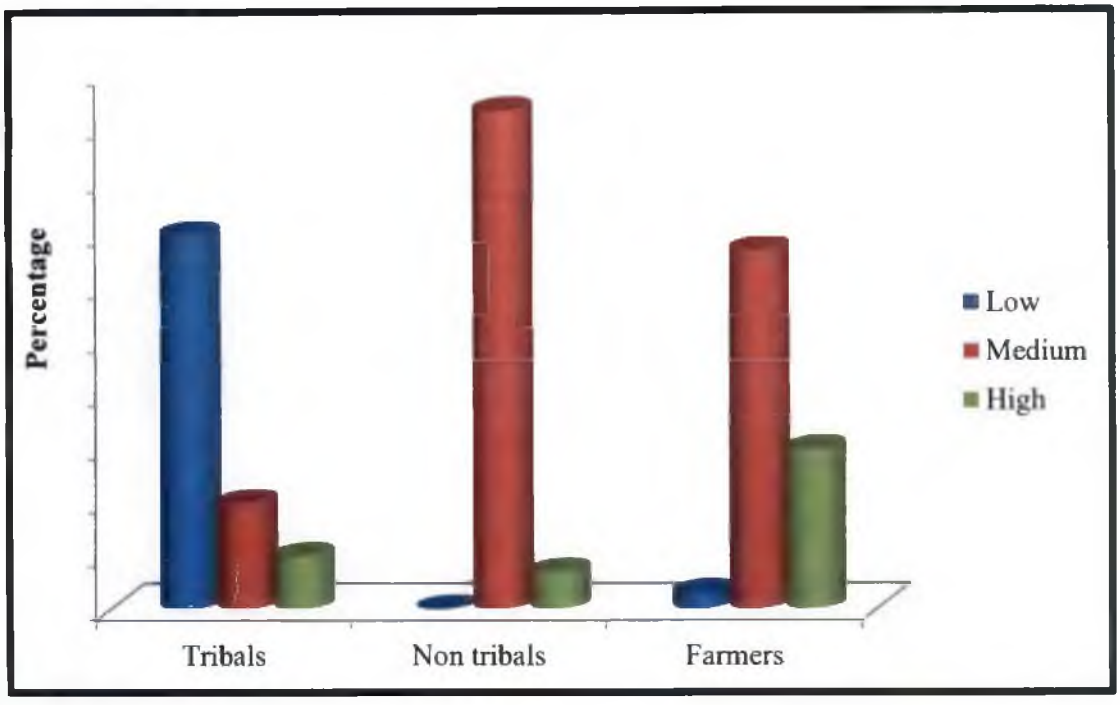

Figure 17. Distribution of respondents based on media utilization

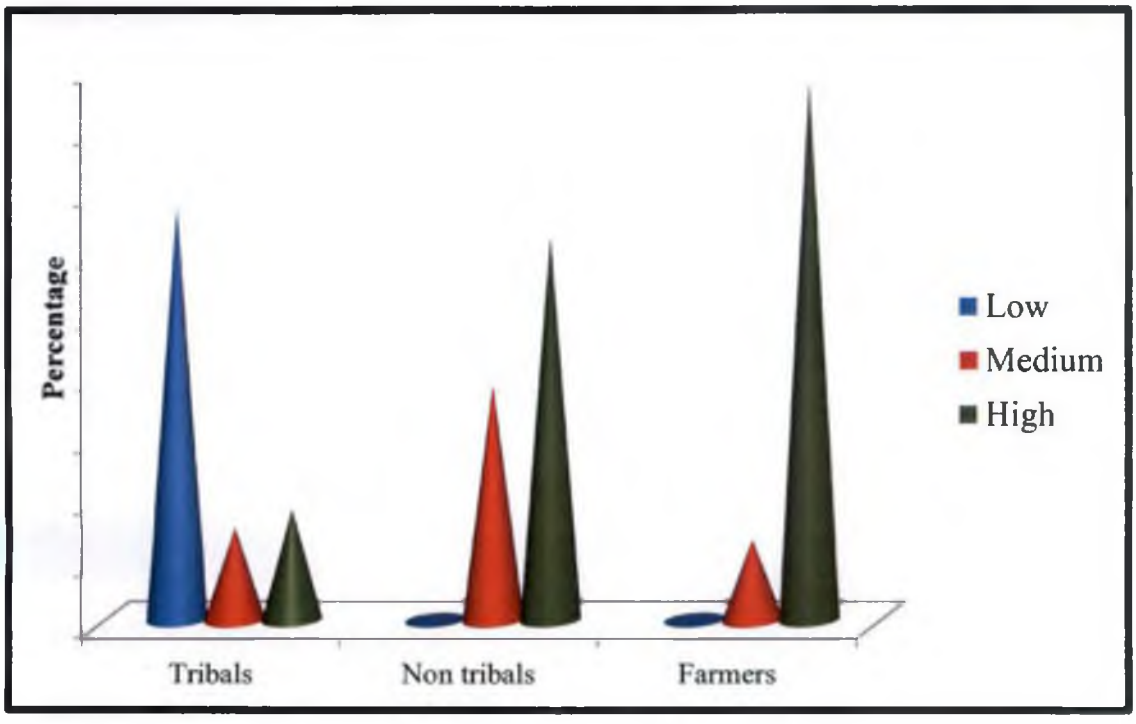

Figure 18. Distribution of respondents based on cosmopoliteness

different cultivated crops. Cent per-cent of them were literate which also contributed to high media utilization.

4.5.12 Cosmopoliteness

Table 18. Distribution of respondents based on cosmopoliteness

(N=150)

Sl. No.	Category	Score Range	Tribal labourers (n=60)		Non-tribal labourers (n=60)		Farmers (n=30)	
			No.	%	No.	%	No.	%
1.	Low	3 to 6	40	67	0	0	0	0
2.	Medium	6 to 9	9	15	23	38	4	13
3.	High	9 to 12	11	18	37	62	26	87
Average			5.45(41.26)		9 (92.68)		9.6 (109.6)	

Kurskal Wallis : 67.420 P=0.0001

CD(.05) for 60,60 : 18.989, CD(.05) for 60,30 : 23.256

(CD- critical difference)

Scrutiny of the Table 18 revealed that 67.00 per-cent of the tribal labourers had low cosmopoliteness followed by 18.00 per-cent had high degree of cosmopoliteness and only 15.00 per-cent of them coming under medium category.

It was inferred from the Table that 62.00 per-cent of the non-tribal labourers had highly cosmopolite nature and 38.00 per-cent were of them had medium cosmopoliteness. None of the non-tribal labourers came under low cosmopoliteness category. In the case of farmers majority of the respondents

(87.00 per-cent) were coming under the category of high cosmopoliteness followed by 13.00 per-cent with medium cosmopolite nature and none of them had less cosmopoliteness.

If we go through the average score of cosmopoliteness among tribal labourers, non-tribal labourers and famers it can be understood that there was significant difference between the scores of tribal labourers and non-tribal labourers as well as between tribal labourers and farmers. The average score of cosmopoliteness was on par for the non-tribal labourers and farmers.

Their inherent vulnerability and adherence to ethical values make tribespeople less competent in the present competitive society. The tribal people especially labourers usullay confines to settle in their own locality and geographical areas, without moving out from their part. They contented with what they have, this is an important trait of tribal labourers their needs and wants are limited. Whereas the other two categories have high cosmopoliteness. The tribal labourers likes to stick with their own community only and most of them don't have any membership in any social organisations. Illiteracy is a key component for the low cosmopoliteness.

4.6 CANONICAL CORRELATION ANALYSIS

The performance of dependent variables is expected to be influenced by some selected profile characteristics of three groups' namely tribal labourers, non-tribal labourers and farmers. In order to analyse the effect of independent variables and the dependent variables on the scale of practice canonical correlation analysis was performed. Canonical correlation deals with the correlation between a pair of linear combination of set of dependent variables and independent variables namely canonical variables. The number of pairs of canonical variables is exactly the least number of variables either in the dependent set or in the independent set. This analysis transforms the original X vector and Y

vector to pairs of canonical composites and their canonical correlation and its test of significance.

Table 19.

List of independent variables with dependent variables for Canonical Correlations

4.6.1 Survey Variables

Independent variables (X)	Dependent variables (Y)
1.Age (X_1) 2.Family size (X_2) 3.Educational status (X_3) 4.Monthly Income (X_4) 5. Land ownership (X_5) 6. Alcoholism (X_6) 7.Acess to common property Resources (X_7) 8. Environmental orientation (X_8) 9.Political Orientation (X_9) 10.Body Mass Index (X_{10}) 11. Media Utilization(X_{11}) 12. Cosmo politeness (X_{12})	1. Social participation (Y_1) 2. Work participation (Y_2) 3. Scale of practice (Y_3)

Canonical Analysis Elements

Canonical Composite of Dependent Variables	Correlation	Composite of Independent Variables
Dependent canonical variate	*Rc*	*Independent canonical variate*

4.6.2 Canonical analysis for tribal labouers

Three pairs of canonical variates were estimated for providing canonical weights and loading with canonical correlations 0.98, 0.63, and 0.39 respectively

(Table 20) and its test of significance based on Wilks' lambda was found to be statistically significant (Table 21) at 0.01 level.

The standardised coefficients explain the weights of each variable on its canonical variate of X and Y and canonical loading provides the correlation of observed variate on its canonical variates which are helpful in identifying the most important independent variables and dependent variables to address the scale of practice.

The results of canonical correlation analysis presented in the Table 20 suggest that there were three canonical correlations between three pairs of linear combinations of independent variables (vector X) and dependent variables (vector Y). The estimated canonical correlation were respectively 0.98 and 0.63 and 0.39 and its tests of significance suggests that the first canonical correlation was significant at I per-cent level and second canonical correlation was significant at 0.05per-cent level and third was not significant.

The independent variables income (0.89), educational status (0.83), political orientation (0.9), anthropometric measurement (0.86), media utilization (0.87) and cosmopoliteness (0.92) had highly estimated rotated structured coefficients on first canonical variate. The second canonical variate doesn't show any implications.

Table provides the canonical weights and canonical loadings for the dependent and independent variables on their canonical variates. The estimated rotated structured coefficients (canonical weights) based on first canonical function for Y_1, Y_2 and Y_3 were respectively 0.91, 0.26 and 0.89 which suggest that Y_1 and Y_3 had high weights on its canonical variates. While looking through the second function Y_2 had high weight (0.68) on its canonical variate.

The most important dependent variable were Y_1 and Y_3 followed by Y_2.

Table (1) also shows that tribal labourers were having good knowledge with the indigenous practices and most them are using knowingly or unknowing in the field during work.

Wayanad is famous for the tribal agriculture so naturally the tribal labourers who is working the field had awareness about the indigenous practices and its applications

Table (3) reveals that the tribal labourers had more work participation compared to other two category. The Table 22 also shows that work participation is an important dependent variable and having high weight in the second canonical variate.

Social participation also played a significant role in case of tribal labourers. The result of canonical correlation was in line with the findings of Ramakrishnan (1993), according to that report 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. That is for securing necessities of life social participation is indeed. It again comes to the duty of extension functionaries as well as social activists to make the tribal people more active in the social activities.

The total development of a community is directly related to the participation of all the members in every developmental activities. Furthermore follow up activities are needed for influencing the other members of the community. The first and important task of the extension functionaries and social activists is to make them convince that all these group activities are for their development and sustainability.

Work participation gives an idea about the extent of the involvement of tribal labourers in different operations in rice farming. Most of the farmers preferred tribal labourers to work in their fields. The core reason behind this was the less payment and the work skill among them.

The drudgery works like transplanting intercultural operations haversting etc., are assigned to tribal women agriculture labourers.

This was on par with the findings of Kumar and Anjali (2004) in which it was reported that the work participation was higher among women labourers as compared to the men work force. The study also emphasized that farmers are giving the drudgery works to women labourers in rice farming. Tribal labourers should be trained with the mechanization practices. The government should take necessary steps to implement mechanization and inoculation of those practices in the labourers especially in tribal labourers.

The scale of practice is an important variable with respect to tribal labourers. Tribal labourers and the farmers were the gate keepers of the indigenous agricultural Practices. Compared to non-tribal labourers, tribal labourers were having more knowledge. Indigenous agricultural Practices were the key tool of the climate resilient agriculture (FAO, 2009). They also said that refinement and generation of new technologies from indigenous agricultural Practices will be suitable for the future and sustainable agriculture. Tribals were the aboriginals in Wayanad as the traditional labourers they were aware of the indigenous practices along with the farmers, so necessary mechanisms should be implemented to protect and document the indigenous agricultural Practices.

Income being a serious issue among tribal labourers. While comparing with non-tribal labourers, they were the least paid ones. Most of the farmers prefer them to work on their fields, inorder to save money most of the farmers offers tribal labourers alcoholic beverage to ensure better participation. A lion share of the income is diverted towards alcohol and tobacco. Saving of income is comparatively a new term to tribals. Most of them don't even save the money they get but *Kurma* and *Kurichya* community is quite forward among tribals. Only people belonging to those communities have savings.

Educational status of each individual is a measure to analyze the status of a community. It is necessary that, there should be enough facilities to make them educated.

People who all having exposure to different mass media would be supposed to have a better knowledge about the things happening in and around their society. This might also lead to a better livelihood status of the members of the society. By improving the educational status, simultaneously increase rate of media utilization, political orientation, and cosmopoliteness which finally resulting to a better living standard among the tribal labourers.

Results of canonical correlation emphasize that for tribal labourers their work participation, social participation, and scale of practice of indigenous agricultural practices being important variables. Along with a set of profile characteristics of tribal labourers such as income, educational status, political orientation, media utilization, anthropometric measurement, and cosmopoliteness.

Table 20

Canonical Correlation Analysis

Measures of Overall Model Fit for Canonical Correlation Analysis

Test of significance of canonical functions

Canonical Function	Canonical Correlation	F Statistic	Probability
1	0.98	13.3248	0.0001
2	0.63	1.7075	0.0410
3	0.39	0.8889	0.5502

Table 21. Multivariate test of Significance canonical analysis

	Statistic	Df1	Df2	F	Prob>F
Wilks' lambda	.0110941	36	133.685	13.3248	0.0000a
Pillai's trace	1.5375	36	141	4.1175	0.0000a
Lawley-Hotelling trace	45.3037	36	131	54.951	0.0000a
Roy's largest root	44.4467	12	47	174.0827	0.0000u

Table 22. Canonical correlation analysis for tribal labourers

Variable	Function 1		Function 2	
	r_s (rotated loading)	r_s^2 (%)	r_s (loading)	r_s^2 (%)
Social participation	0.91	82.81	0.0297	.04
Work participation	0.26	6.76	-0.68	46.24
Scale of practice	0.89	79.21	-0.01	0.01
Age	-0.36	12.96	-0.01	0.01
Farm size	0.57	32.49	-0.02	0.04
Family size	-0.004	.0016	-0.18	3.24
Income	0.89	79.21	0.0002	0.004
Educational status	0.83	68.89	-0.11	1.21
Alcoholism	-0.15	2.25	0.09	0.81
Access to common property resources	0.66	43.26	-0.34	11.56
Environmental orientation	0.69	47.61	0.09	0.81
Political orientation	0.90	81.00	-0.12	1.44
Anthropometric measurement	0.86	73.96	0.31	9.61
Media utilization	0.87	75.69	-0.0311	0.09
Cosmo politeness	0.96	92.16	0.2258	4.84

4.6.3 Canonical analysis for non-tribal labourers

Three pairs of canonical variates were estimated for providing canonical weights and loadings with canonical correlations 0.68, 0.54, and 0.33 respectively (Table 24) for non-tribal labourers.

Multivariate test of significance based on Wilks' lambda was found to be statistically significant (Table 23) at 0.01 level.

The standardised coefficients explain the weights of each variable on its canonical variate of X and Y and canonical loading provides the correlation of observed variate on its canonical variates which are helpful in identifying the most important independent variables and dependent variables to address the scale of practice.

The results of canonical correlation analysis presented in the Table suggest that there were three canonical correlations between three pairs of linear combinations of independent variables (vector X) and dependent variables (vector Y). The estimated canonical correlation were respectively 0.68 and 0.54 and 0.33 and its tests of significance suggest that the first canonical correlation was significant at five per-cent level and second and third canonical correlation was not significant at 0.05 level..

The independent variables age (0.39), alcoholism (0.59), income (0.38) and environmental orientation (0.48) had high estimated rotated structural coefficients (loadings) on first canonical variate. The second canonical variate didn't provides contribution of other dependent variables.

Table 25 provides the canonical weights and canonical loadings for the dependent and independent variables on their canonical variates. The estimated rotated structural coefficients (canonical loadings) based on first canonical function for Y_1, Y_2 and Y_3 were respectively 0.99, 0.0096 and 0.11 and suggest that Y_1 had high weights on its canonical variate as compared to other two dependent variables. Social participation is just like a life style of the non-tribal labourers. Their social participation average score was high compared to other two groups (Table 5).

Non-tribal labourers mingle with the society in an applauding way. They were participating the community functions and all other social activities in the society. Most of them were members in different organisations and political parties in the society.

Alcoholism seems to be an important issue with respect to the non-tribal labourers. The result was in line with the findings of Nishanth (2016) stating that alcohol consumption was high among the youths and labourers in Kerala, which may lead to several social and health issues in society.

Concerns towards environment and nature made non-tribal labourers had high environmental orientation. They were also aware of the changes in the environment and the remedial measures to put forth to exploitation against nature. Most of them were having membership in the different NGO's with respect to the environmental protection.

Analysing the canonical correlation results of nontribal labourers it could be understood that social participation is major dependent variable. Age, monthly income, alcoholism, and environmental orientation were the important independent variables.

Table 23

Canonical Correlation Analysis

Measures of Overall Model Fit for Canonical Correlation Analysis

Test of significance of canonical functions

Canonical Function	Canonical Correlation	F Statistic	Probability
1	0.6499	1.5282	0.0441
2	0.5426	1.1068	0.3547
3	0.3374	0.6036	0.8027

Table 24. Multivariate test of Significance canonical analysis.

	Statistic	Df1	Df2	F	Prob>F
Wilks' lambda	.361181	36	133.685	1.5282	0.0441a
Pillai's trace	.830605	36	141	1.4996	0.0504a
Lawley-Hotelling trace	1.27689	36	131	1.5488	0.0397a
Roy's largest root	.731114	12	47	2.8635	0.0049u

Table 25. Canonical correlation analysis for non-tribal labourers

Variable	Function 1	
	r_s (rotated loading)	r_s^2 (%)
Social participation	0.99	98.01
Work participation	0.0097	0.0081
Scale of practice	0.11	1.21
Age	0.39	15.21
Farm size	0.08	0.64
Family size	-0.0001	0.000001
Income	0.38	14.44
Educational status	-0.23	5.29
Alcoholism	0.59	34.81
Access to common property resources	0.15	2.25
Environmental orientation	0.48	23.52
Political orientation	-0.27	7.29
Anthropometric measurement	0.18	3.24
Media utilization	0.03	0.09
Cosmopoliteness	0.28	7.84

4.6.4 Canonical analysis for famers'

Three pairs of canonical variates were estimated for providing canonical weights and loadings with canonical correlations 0.76, 0.70, and 0.50 respectively (Table 26) and its test of significance based on Roy's largest root found to be statistically significant (Table 27) at 0.1 level.

The standardised coefficients explain the weights of each variable on its canonical variate of X and Y and canonical loading provides the correlation of observed variate on its canonical variates which are helpful in identifying the most important independent variables and dependent variables to address the scale of practice.

The results of canonical correlation analysis presented in the Table 20 suggest that there were three canonical correlations between three pairs of linear combinations of independent variables (vector X) and dependent variables (vector Y). The estimated canonical correlation were respectively 0.76 and 0.70 and 0.50 and its tests of significance suggest that the first canonical correlation was significant at 10 per-cent level.

The independent variables age (0.49), alcoholism (0.39), media utilization (0.55) and cosmopoliteness (0.2) had high estimated structured coefficients on first canonical variate. The second canonical variate doesn't show any implications.

Table provides the canonical weights and canonical loadings for the dependent and independent variables on their canonical variates. The estimated rotated structured coefficients (canonical weights) based on first canonical function for Y_1, Y_2 and Y_3 were respectively -0.019, 0.02 and 0.97 suggest that Y_3 had high weights on its canonical variate.

The canonical loading of these variables on first canonical variate also confirms that the scale of practice (Y_3) was the most important dependent variable.

Scale of practice is an important variable with respect to the famers in Wayanad the knowledge about indigenous agricultural practices was high among famers compared to other two categories because they are the work designers for their field how to work? What to do? etc., the labourers were working according to the instructions by the farmer. The canonical correlation results also coincide in accordance with Table 2 of farmers group with respect to scale of practice of indigenous agricultural practices.

Age being an important factor with respect to the famers' middle and old aged farmers are having an interest in rice farming and most of them were the repertoire of traditional practices. The result of canonical correlation analysis was on par with the findings of Preetha (1996) and Swapna (2003) stating that middle and old aged farmers having more knowledge regarding the traditional agricultural practices.

Most of the farmers showed a higher degree of media utilization printed media as well as electronic media are being used by them regularly. Media utilization is a principle component of progressiveness. Higher media utilization emphasis on the quality education and thirst of knowledge. Media utilization made them awareness regarding the environmental issues and organic farming principles.

Most of the farmers had high cosmopoliteness (Table 17), the canonical correlation analysis also stress the same. A liberal mind set can be buildup through the cosmopolite nature. Table 28 shows cosmopoliteness had a significant role with regard to the farmers group. Most of them were familiar with the nearby town regarding the marketing of products and purchase of inputs for the farming

Examining the canonical correlation results of farmers, scale of practice of indigenous practice was the important dependent variable. Age, alcoholism, media utilization, and cosmopoliteness were the important independent variables.

Due to small number sample the canonical analysis for the second variate is not significant.

Table 26

Measures of Overall Model Fit for Canonical Correlation Analysis

Test of significance of canonical functions

Canonical Function	Canonical Correlation	F Statistic	Probability
1	0.7634	1.0929	0.3853 a
2	0.7044	0.9203	0.5734 e
3	0.5053	0.5830	0.8062 e

Table 27. Multivariate test of Significance canonical analysis

	Statistic	Df1	Df2	F	Prob>F
Wilks' lambda	.15648	36	45.0468	1.0929	0.3853 a
Pillai's trace	1.33446	36	51	1.1351	0.3342 a
Lawley-Hotelling trace	2.72523	36	41	1.0346	0.4556 a
Roy's largest root	1.39723	12	17	1.9794	0.0964 u

Table 28. Canonical correlation analysis for farmers

Variable	Function I	
	r_s (rotated loading)	r_s^2 (%)
Social participation	-0.0193	0.1
Work participation	0.0230	0.4
Scale of practice	0.97	94.09
Age	0.4917	24.01
Farm size	0.2097	4
Family size	0.3561	12.25
Income	0.3236	10.24
Educational status	0.2295	4.84
Alcoholism	-0.3985	15.21
Access to common property resources	0.0223	0.4
Environmental orientation	0.2251	4.84
Political orientation	0.1760	2.89
Anthropometric measurement	0.3517	12.25
Media utilization	0.5535	30.25
Cosmo politeness	0.2057	18.49

4.7 CONSTRAINTS FACED BY THE TRIBAL LABOURERS, NON-TRIBAL LABOURERS AND FARMERS

Constraints experienced by three groups were recorded during the pilot study and few more added during the focus group interview during the time of study.

4.7.1 Constraints Faced by the Tribal Labourers

Table 29. Constraints faced by the tribal labourers

Sl.No.	Constraints faced by tribal labourers	Rank
1	Low wage rate.	I
2	Few labour days.	II
3	High cost of living.	III
4	Lack ownership rights for the existing property.	IV
5.	Safe shelter to stay.	V
6	Reluctance of farmers for rice cultivation.	VI
7	Unnecessary delay in the house construction for tribal peoples by the local self-government.	VII
8	Illiteracy	VIII
9	Health problems	IX
10	Access to forest resources.	X

The low wage rate being an important constraint faced by the tribal labourers. Due to the hype of mechanization, labour days had been shrunken is also a severe issue with regard to tribal labourers, the reluctance of farmers towards rice farming and high cost of living aggravated this situation ultimately leads to poverty and malnutrition.

Another important issue faced by the tribal labourers is the lack of ownership rights for the existing property. Even though they were the true owners of the land in Wayanad, migration wave of settlers from Malabar and Travancore region during the pre and early post-independence era forced tribal labourers to dispose off their lands occupied by them for centuries. Inspite of some successful programmes but most of the programmes implemented by the government seems to be no significance among tribespeople. The reasons are pilferage of funds and absence of meaningful implementation of programmes. Tribal struggles in the recent past exemplify these reasons. Callousness and apathy of the bureaucracy and political executives are the root cause of the tribal marginalization and genesis of tribal extremism.

4.7.2 Constraints Faced by the Non-tribal Labourers

Table 30. Constraints faced by the non-tribal labourer

Sl.No.	Constraints faced by non-tribal labourers	Rank
1	Less wage rate	I
2	Few labour days	II
3	Reluctance of farmers for rice cultivation	III
4	Conversion of rice fields for other activities	IV
5	Shooting up of price for essential commodities.	V

Most of the constraints faced by the non-tribal labourers were having a sharp similarity with that of tribal labourers, such as less wage rate, less labour days, the reluctance of farmers for rice cultivation, etc., and they are much concerned about the conversion of the rice tracts for other activities which might

lead to lose of job and ecological imbalance. They are group having high environmental orientation and social participation.

4.7.3 Constraints Faced by the Farmers

Table 31. Constraints faced by the tribal labourers

Sl.No.	Constraints faced by farmers	Rank
1	Labour shortage.	I
2	Animal menace.	II
3	High wage rate.	III
4	Shortage of quality inputs.	IV
5	High cost of production leads the rice farming as uneconomic practice.	V
6	No such initiatives are there for to conserve traditional landraces in the agriculture departments.	VI
7	MGNREGA – reluctance on the part of even skilled labourers to work in rice field.	VII
8.	Change in raining pattern results in crop failure.	VIII
9.	Inadequate incentives for rice cultivation.	IX

Famers also face some difficulties with the rice farming labour shortage was top among them. Most of the farmers reported that unavailability and timely availability of labourers is a major reason for the withdrawal from rice cultivation.

In recent day there is an increase in the animal menace which also endured the situation to worsen, especially in Thirunelli and Noolpuzha panchayths. High wage rate and shortage of quality inputs added rice cultivation into an uneconomic activity.

Even though many farmers are conserving the traditional land races but none them get benefit from the government, resulted in the loss of traditional varieties. MGNREGA is a successful programme implemented all over India to ensure 100 days of wage for the rural people, but in Wayanad with regard to rice farming it is the villain. Most of the farmers complained that even the skilled labourers are also not willing to work in the field during the seasons.

As a cause of climate change, the unexpected rain and drought geared down the rice production in the district. Even though rice farming is necessary for the ecological balance none of the government agencies is providing adequate support for rice farming.

Plate 3. Tribal hamlet in Noolpuzha Panchayath

Plate 4. Tribal houses in Thirunelli panchayath

Plate 5. Rice tracts in Noolpuzha panchayath

Plate 6. Rice tracts in Thirunelli panchayath

Plate 7. Rice tracts of Kottathara panchatyath

Plate 8. Leaves of Sandpaper tree

Plate 7. Rice tracts of Kottathara panchatyath

Plate 8. Leaves of Sandpaper tree

Plate 9. A *paniya* tribal labourer

Plate 10. A *kattunaika* tribe

Plate 11. A typical *Kattunaika* house

Plate 12. Male and female of *Adiya* community in Thirunelli

Plate 13. A tribal women of *Adiya* community

SUMMARY

5. SUMMARY

The dawn of the concept of sustainable agriculture in late eighties in Indian agricultural scenario has conjured interest on indigenous technical knowledge (ITK) that has the element of use of natural products to solve the problems relating to agriculture and subsidiary activities. Indian farmers, over centuries, have learnt to grow food and to survive in challenging environments, where the rich tradition of ITK has been interlinked with the agricultural practices followed by them. Wayanad district is purposively selected to interlink the traditional agricultural practices in rice farming and to compare the tribal groups' performance with other communities regarding various social, economic and cultural aspects. Wayanad region is a showcase for the most vibrant and yet conflicting social and cultural ethos. Once only tribespeople inhabited and blessed with the rice tracts flushing greenery in a panoramic view, but now Wayanad has become the recipient of waves of migration from the plains of East and West, which eventually made the tribes a minority, constituting less than half of the total population. In the earlier days, the remoteness of Wayanad and linguistic uniqueness of the tribes slowed down the advancement of developmental inputs. Lack of adequate support, inappropriate implementation of developmental plans, pilferage of funds and exploitation has often been the reasons for the stagnation of tribal economy of Wayanad. Keeping all these in view, the present investigation was undertaken with the major objectives of comparative analysis of the indigenous agricultural practices with regard to rice farming and its scale of practice, social participation, work participation, and media utilization among tribal labourers, non-tribal labourers, and farmers.

The study was conducted in Wayanad district of Kerala. This district has been purposively selected for conducting the study because this is one of the districts in Kerala having the highest concentration of tribal settlements. A sample of 50 respondents were selected from each purposively selected panchayaths namely Noolpuzha, Thirunelli, and Kottathara of three taluks in Wayanad.

Thus 150 respondents were selected for the study which includes 60 tribal labourers, 60 non-tribal labourers, and 30 farmers.

Detailed review of literature, discussions with experts and scientists in agricultural extension were relied upon for the selection of variables. Social exclusion and extent of deprivation were selected as dependent variables for the study. The profile characteristics of the respondents were the independent variables. The data were collected using pre-tested and structured interview schedule. The statistical tools used were frequency, simple percentage analysis, Kruskal-wallis test, and canonical correlation analysis.

The salient findings are summarised below:

1. Cent per-cent of the respondents of three groups had been adopting the practices like harvesting is usually done after 7-8 days from the new moon day and seeds are dried in sunshine and at night for 7 days.
2. More than half (59.00 per-cent) of the tribal labourers were having medium scale of practice of Indigenous agricultural practices.
3. Less than a half (47.00 per-cent) of non-tribal labourers had low scale of practice.
4. About 40.00 per-cent of the farmers had high scale of practice.
5. The tribal labourers participation in various operations of rice farming was higher compared to other two categories, especially in land preparation (93.00 per-cent), nursery management (90.00 per-cent), transplantation (70.00 per-cent)), intercultural operations (81.00 per-cent), harvesting (91.00 per-cent), and postharvest management (70.00 per-cent).
6. The non-tribal labourers had a higher participation in operations like land preparation (90.00 per-cent), nursery management (96 per-cent), intercultural operations (80 per-cent), and harvesting (80 per-cent).
7. Farmers had high participation in operations like land preparation (80 per-cent), water management (90.00 per-cent), and post-harvest management (90.00 percent).

8. The majority (72.00 per-cent) of the tribal labouers had high work participation.
9. More than a half (57.00 per-cent) of the non-tribal labourers had high work participation.
10. The bout two third of them had low work participation (67.00 per-cent).
11. The majority of tribal labourers (70.00 per-cent) had very low social participation.
12. About 97.00 per-cent of the non-tribal labourers had high social participation.
13. More than half (57.00 per-cent) of the farmers indicated a high social participation.
14. More than half of the tribal people (52.00 per-cent) were from the middle age group.
15. Most of the non-tribal respondents (87.00 per-cent) belonged to the middle age category.
16. More than half (53.00 per-cent) of the farmer respondents belonged to middle age category.
17. About 60.00 per-cent of tribal labourers were illiterate.
18. Among non-tribal labourers more than half of the respondents (58.00 per-cent) had obtained upper primary school education.
19. About 40.00 per-cent of the farmers had upper primary school level education.
20. The majority of the tribal labourers (85.00 per-cent) had three to six members in their family.
21. The majority of the non-tribal labourers (93.00 per-cent) had three to six members in their family.
22. The majority of the farmers (85.00 per-cent) had three to six members in their family.
23. About 56.00 per-cent of the tribal labourers received a low monthly income

24. Regarding the monthly income 90.00 per-cent of non-tribal labourers had medium level of income.
25. On surveying it was found that 83.00 per-cent of the farmers were getting high level of income.
26. Analysing the land holdings pattern it was found that more than 50.00 per-cent of the tribal labourers' possessed land less than or equal to five cents
27. The majority of the non-tribal respondents (48.00 per-cent) possessed more than 10 cents of land.
28. On observing the farmers based on land ownership it was evident that cent per-cent of the farmers possessed more than 100 cents of land.
29. Regarding to alcoholism it was found that 70.00 per-cent of the tribal labourers were alcohol consumers.
30. Regarding to alcoholism it was found that 68.00 per-cent of the non-tribal labourers were alcohol consumers.
31. Only 30.00 percent of farmers consumes alcohol.
32. Upon analyzing access to common property resources it was found that 73.00 per-cent of the tribal labourers had medium access to common property resources.
33. The majority of the non-tribal labourers (95.00 per-cent) and farmers (97.00 per-cent) had medium access to different common property resources.
34. Observing tribal labourers distribution environmental orientation it was found that 48.00 per-cent of the respondents had high environmental orientation followed by 42.00 per-cent with very high level environmental orientation.
35. The majority of the non-tribal labourers (90.00 per-cent) and farmers (87.00 per-cent) had very high level of environmental orientation.
36. . It is observed that 38.00 per-cent of the tribal labourers had low level of political orientation.

37. Observing non-tribal labourers the majority of the respondents (82.00 per-cent) had high level of political orientation.
38. Most of the farmer respondents (70.00 per-cent) had high political orientation.
39. On analyzing the Body Mass Index it can be inferred that majority of the tribal labourers (73.00 per-cent), non-tribal labourers (97.00 per-cent) and farmers (97.00per-cent) were with optimal body weight.
40. Regarding the media utilization the majority of the tribal labourers (70.00 per-cent) had less media utilization.
41. About 62.00 per-cent of the non-tribal labourers and 87.00 per-cent of the farmers had high cosmopoliteness.
42. Results of canonical correlation emphasize that for tribal labourers their work participation, social participation, and scale of practice of indigenous agricultural practices being important dependent variables. Income, educational status, political orientation, media utilization, anthropometric measurement, and cosmopoliteness were the important independent variables.
43. Analysing the canonical correlation results of nontribal labourers it could be understood that social participation is major dependent variable. Age, monthly income, alcoholism, and environmental orientation were the important independent variables.
44. Examining the canonical correlation results of farmers, scale of practice of indigenous practice was the important dependent variable. Age, alcoholism, media utilization, and cosmopoliteness were the important independent variables.
45. Examining the canonical correlation results of farmers, scale of practice of indigenous practice was the important dependent variable. Age, alcoholism, media utilization, and cosmopoliteness were the important independent variables.
46. Low wage rate, few labour days, high cost of living, lack ownership rights for the existing property, reluctance of farmers for rice cultivation,

and unnecessary delay in the house construction for tribal peoples by the local self-government being the important constraints faced by the tribal labourers.

47. Less wage rate, few labour days, reluctance of farmers for rice cultivation, conversion of rice fields for other activities, and shooting up of price for the essential commodities being the important constraints faced by the no-tribal labourers.
48. Labour shortage, animal menace, high wage rate, shortage of quality inputs, high cost of production leads the rice farming as uneconomic practice, no such initiatives are there for to conserve traditional landraces in the agriculture departments, MGNREGA – reluctance on the part of even skilled labourers to work in rice field, change in raining pattern results in crop failure and inadequate incentives for rice cultivation are important constraints faced by the farmers.

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INDIGENOUS AGRICULTURAL PRACTICES IN RICE FARMING BY TRIBAL AND NON TRIBAL AGRICULTURAL LABOURERS AND FARMERS IN WAYANAD DISTRICT: A COMPARATIVE ANALYSIS

by

Vishnu Narayanan P.M

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ABSTRACT

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ABSTRACT

The study entitled "Indigenous agricultural practices in rice farming by tribal and non-tribal agricultural labourers and farmers in Wayanad district: A Comparative analysis" was conducted at Wayanad in three grama panchayaths having maximum tribal population, namely Kottathara, Noolpuzha, Thirunelly covering 150 respondents with 50 respondents(20 tribal labourers, 20 non-tribal labourers and 10 farmers) from each selected panchayath. The objectives of the study were to identify and document indigenous agricultural practices and study its scale of practice by tribal and non-tribal agriculture labourers and farmers. Their work participation, social participation, media utilization, profile characteristics and constraints were also studied.

It was found that 100 per-cent respondents of three groups had been adopting the practices like harvesting is usually done after 7-8 days from the new moon day and seeds are dried in sunshine and at night for 7 days. On the analysis of data, it was found that that majority (59.00 per-cent) of the tribal labourers were having medium scale of practice of indigenous agricultural practices. In the case of non-tribal labourers most of them (47.00 per-cent) had low scale of practice, whereas 40.00 per-cent of the farmers had high scale of practice. The work participation was high among tribal labourers (72.00 per-cent) followed by non-tribal labourers (57.00 per-cent) and farmers had low work participation (67.00 per-cent). Majority of the tribal labourers possess a low social participation (70.00 per-cent).

In the case of profile characteristics of the tribal labourers it was found that more than half of tribal people (52.00 per-cent) were from the middle age group, 60.00 per-cent of them were illiterate, the majority of the tribal labourers (85.00 per-cent) had three to six members in their family, 56.00 per-cent of the tribal labourers received low level of income, more than 50.00 per-cent of the tribal labourers' possessed land less than or equal to five cents, 70.00 per-cent of the tribal labourers consumes alcohol, 73.00 per-cent of the tribal labourers had medium level access to common property resources, 48.00 per-cent of the tribal labourers had high environmental orientation, 38.00 per-cent of the tribal labourers had low level of political orientation, that majority of the tribal labourers (73.00 per-cent) were with optimal body weight, majority of the tribal labourers (70.00 per-cent)

had less media utilization, and that 67.00 per-cent of the tribal labourers had low cosmopoliteness.

Results of canonical correlation emphasize that for tribal labourers their work participation, social participation, and scale of practice of indigenous agricultural practices were the important dependent variables. Independent variables such as income, educational status, political orientation, media utilization, anthropometric measurement, and cosmopoliteness were found to be significance to them. Evaluating the canonical correlation results of nontribal labourers it could be understood that social participation is major dependent variable. Age, monthly income, alcoholism, and environmental orientation were the important independent variables. Examining the canonical correlation results of farmers it was found that, scale of practice of indigenous practice was the important dependent variable. Age, alcoholism, media utilization, and cosmopoliteness were the important independent variables. Important constraints faced by the tribal and non-tribal labourers were less wage rate, few labour days, high cost of living, most of the farmers were reluctant to do rice farming. Labour shortage, animal menace, high wage rate, shortage of quality inputs, reluctant from the part of even skilled labourers to work in the field etc., were the major constraints faced by the farmers.

From the findings it can be concluded that tribal labourers were the most ostracized, subjugated, and socially excluded category in Wayanad district. Farmers had high scale of practice followed by tribal and nontribal labourers respectively. Even though they were rich in labour skill and experience they had been exploited by the other communities. Living standard of them was not upto the mark. Illiteracy, alcoholism, ownership rights of the land, health issues etc., were the important issues faced by them. It was found that they had high work participation and medium level of scale of practice. Social participation was found to be low compared to non-tribal labourers and farmers.

സംഗ്രഹം

വയനാട് ജില്ലയിലെ നെൽകൃഷിയിലെ പരമ്പരാഗത കൃഷിരീതികൾ ഗോത്രവിഭാഗ തൊഴിലാളികളിലും ഗോത്രേതര വിഭാഗ തൊഴിലാളികളിലും കർഷകരിലും: ഒരു താരതമ്യ പഠനം

വയനാട് ജില്ലയിലെ മുന്ന് താലൂക്കിലെ ഏറ്റവും കൂടുതൽ ഗോത്രവിഭാഗമുള്ള ഒരു ഗ്രാമപഞ്ചായത്തിലുള്ള ഒരു പാടശേഖരത്തിലാണ് ഈ പഠനം നടത്തിയിട്ടുള്ളത്. കോട്ടത്തറ, തിരുനെല്ലി, നൂൽപ്പുഴ എന്നീ ഗ്രാമ പഞ്ചായത്തുകളാണ് പഠനവിധേയമാക്കിയത്. ഓരോ പഞ്ചായത്തിൽനിന്നും 20 ഗോത്രവിഭാഗത്തൊഴിലാളികളും 20 ഗോത്രേതര വിഭാഗത്തൊഴിലാളികളും 10 കർഷകരുമാണ് ഈ പഠനത്തിനായി ഉൾപ്പെടുത്തിയത്. ആകെ മൊത്തം 150 സാമ്പിൾ (50 വീതം ഓരോ പഞ്ചായത്തിലും). നെൽകൃഷിയിലെ പരമ്പാഗത കൃഷിരീതികളെ രേഖപ്പെടുത്തുകയും അവ ഗോത്രവിഭാഗ തൊഴിലാളികളിലും ഗോത്രേതര വിഭാഗ തൊഴിലാളികളിലും കർഷകരിലും എത്രത്തോളം പാലിച്ചുപോരുന്നുണ്ടെന്നും, ഗോത്രവിഭാഗ തൊഴിലാളികളുടെയും ഗോത്രേതരവിഭാഗ തൊഴിലാളികളുടെയും, കർഷകരുടെയും സാമൂഹിക പങ്കാളിത്തം കർമ്മപങ്കാളിത്തം, മാധ്യമ ഉപയോഗം, വ്യക്തിവിവരങ്ങൾ എന്നിവയാണ് ഈ പഠനത്തിന്റെ പ്രധാന ലക്ഷ്യങ്ങൾ.

ഈ പഠനത്തിനായി കനോണിക്കൽ കോറിലേഷൻ, കൃഷ്കൽ വാലിസ് ടെസ്റ്റ്, ശരാശരി അനുമാനം എന്നീ ഗണിതരീതികൾ ഉപയോഗിച്ചിട്ടുണ്ട്. നെൽകൃഷിയിലെ പരമ്പരാഗത കൃഷിരീതികളെ ഉപയോഗിക്കുന്ന കാര്യത്തിൽ മറ്റു വിഭാഗങ്ങളെ അപേക്ഷിച്ച് കർഷകരിലാണ് കൂടുതൽ പ്രകടമായിട്ടുള്ളത്. സാമൂഹിക പങ്കാളിത്തത്തിന്റെ കാര്യത്തിൽ ഗോത്രേതര വിഭാഗത്തൊഴിലാളികളാണ് മറ്റു രണ്ടു വിഭാഗങ്ങളെയും അപേക്ഷിച്ച് മുന്നിൽ നിൽക്കുന്നത്. എന്നാൽ, കർമ്മപങ്കാളിത്തത്തിന്റെ കാര്യത്തിൽ

ഗോത്രവിഭാഗതൊഴിലാളികളാണ് മുൻപന്തിയിൽ നിൽക്കുന്നത്. മൂന്നു വിഭാഗത്തിലും പകുതിയിലേറെപേരും മധ്യവയസ്ക വിഭാഗത്തിലാണ് വന്നിട്ടുള്ളത്. ഗോത്രവിഭാഗ തൊഴിലാളികളിൽ 85 ശതമാനം പേരും നിരക്ഷരരാണെന്നുള്ളത് വേദനാജനകമായ ഒരു സത്യം മാത്രം. മൂന്നു വിഭാഗത്തിലും ഭൂരിഭാഗം പേരുടെയും കുടുംബത്തിൽ മൂന്നു മുതൽ ആറ് അംഗങ്ങൾ വരെ ഉണ്ട്. മാസവരുമാനത്തിന്റെ കണക്ക് നോക്കിയാൽ ഗോത്ര വിഭാഗ തൊഴിലാളികൾ മറ്റു രണ്ടുവിഭാഗങ്ങളേയും അപേക്ഷിച്ച് വളരെ താഴെയാണ്. ഗോത്രവിഭാഗ തൊഴിലാളികളിൽ ഭൂരിഭാഗം പേർക്കും 5 സെന്റ് ഭൂമിയെക്കാൾ കുറവാണുള്ളത് എന്നത് മറ്റൊരു സത്യം. ഗോത്രവിഭാഗ തൊഴിലാളികളിൽപ്പെട്ട 70 ശതമാനം പേരും മദ്യപാനത്തിന് അടിമകളാണെന്നുള്ളത്. ആശങ്കയുളവാക്കുന്നതാണ്.

ഗോത്രവിഭാഗ തൊഴിലാളികളിൽ രാഷ്ട്രീയ വീക്ഷണം താതമ്യേന മറ്റ് വിഭാഗങ്ങളെ അപേക്ഷിച്ച് വളരെ കുറവായിട്ടാണ് കാണാൻ കഴിഞ്ഞത്. കനോണിക്കൽ കോറിലേഷൻ ചെയ്തപ്പോൾ കർമ്മപങ്കാളിത്തം, സാമൂഹിക പങ്കാളിത്തം, പരമ്പരാഗത കൃഷിരീതികളുടെ പാലനം എന്നിവയാണ് ഗോത്രവിഭാഗ തൊഴിലാളികളെ സംബന്ധിച്ച് പ്രധാനമായും ചേർന്നു നിൽക്കുന്നത്. എന്നാൽ സാമൂഹിക പങ്കാളിത്തം മാത്രമാണ് ഗോത്രേതര വിഭാഗ തൊഴിലാളികളെ സംബന്ധിച്ച് ചേർന്നുനിൽക്കുന്നത്. പരമ്പരാഗത കൃഷിരീതികളുടെ പാലനം എന്നതാണ് കർഷകരെ സംബന്ധിച്ചിടത്തോളം കൂടുതൽ ഉത്തമമായിട്ടുള്ളത്.

കുറഞ്ഞ വേതനം, കുറഞ്ഞുകൊണ്ടിരിക്കുന്ന തൊഴിൽ ദിവസങ്ങൾ, ഉദിച്ചുയരുന്ന ജീവിതച്ചിലവുകൾ, എന്നിവയാണ് ഗോത്രവിഭാഗ തൊഴിലാളികളുടെയും ഗോത്രേതര വിഭാഗ തൊഴിലാളികളുടെയും പ്രധാന വെല്ലുവിളികൾ.

തൊഴിലാളി ക്ഷാമം, വന്യജീവി ശല്യം, കൂടിയ വേതനം, കുതിച്ചുയരുന്ന ഉത്പാദനച്ചിലവ്, ഗുണമേന്മയുള്ള ഉല്പന്നങ്ങളുടെ അഭാവം എന്നിവയാണ് കർഷകർ നേരിടുന്ന പ്രധാന വെല്ലുവിളികൾ.

സ്വാതന്ത്ര്യലബ്ധിക്കുശേഷവും ഗോത്രവിഭാഗ തൊഴിലാളികളിൽ കാലാനുസൃതമായ മാറ്റങ്ങൾ വന്നില്ലെന്നുമാത്രമല്ല ഗോത്രേതര വിഭാഗ തൊഴിലാളികളെയും കർഷകരെയും വെച്ച് താരതമ്യപ്പെടുത്തുമ്പോൾ ശോചനീയമായ ഒരു അവസ്ഥയാണ് കാണാൻ കഴിയുന്നത്.

APPENDIX

APPENDIX-I

INTERVIEW SCHEDULE

Place:
Date:

1. Name of the respondent :

2. Address :

(a)House No :

(b)Name of the hamlet

(c)Name of the village

(d)Name of the panchayath

3. Age:----------years

Do you belong to ST category :

(b)Name of the tribe

4. Land size (Farm size) :----------

5. Average monthly income:

6. Details about the family

Sl No:	Name	Relationship with the respondent	Age	Educational status	Marital status
1					
2					
3					
4					
5					
6					
7					

7. Educational status: .....

8. Environmental orientation

Sl no	Statements	Strongly agree	agree	neutral	Disagree	Strongly disagree
1	Man is exploiting the earth too much					
2	Man has to be greatly concerned about environmental issues like deforestation.					
3	There is truth in what environmental activists claim and we should lend our support to them					
4	Do you agree that older methods of farming were more safer than present					
5	Intensive agricultural practices Intensive agricultural practices cause environmental hazards.					

9. Alcoholism

- Do you consume alcohol? Yes/ No
- Level of intake

Very low	Low	moderate	high	very high

- Frequency of intake

Daily	more than once in a week	weekly	Monthly	occasionally

10. Political orientation

Sl No:	Items	Strongly agree	agree	neutral	disagree	Strongly disagree
1	Recognizing power relations existing in the society is very important in resolving the problems of the society.					
2	Democracy is the best political principle and philosophy for ideal governance					
3	Individual approach will not help in solving problems					
4	Organizing people for asserting their genuine and fundamental rights is an important pre-requisite for a democratic society.					
5	Political parties are inevitable and indispensable for a vibrant democratic society functioning in accordance with constitution.					
6	Sustainable progress and welfare of people can be achieved only through organized political and social interventions					
7	A political approach to social issues actually preserve the existing power relations and prevent distributive justice, social transformation and progress					
8	Political parties and other social organisations play no role in social development and therefore it is a curse to the society					

9	Principles like freedom, equality and fraternity should be the guiding cardinal principles of a strong civil society.					
10	Distributive justice makes a social system humane and modern.					

11. Anthropometric measurements:

Particulars	kg/cm
Weight for age	
Height for age	

12. Access to Common property resources

Sl No:	**Common property resources**	**Access**			
		Unlimited/ unrestricted (4)	Limited/ restricted (3)	Moderately restricted (2)	Highly restricted (1)
1	Forest (a)Minor forest produce (b)Medicinal plants (c)Honey (d)Fruits (e)Others				
2	Water resources				
3	Common land resources				

12. Media utilization

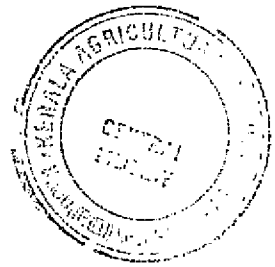
Sl. No.	Source	Regularly	Often	Seldom	Rare
I.	Traditional media				
II.	Print media Print media (Newspapers, Magazines, Periodicals, Booklets, Brochures and Others				
III.	Electronic media a) Radio				
IV.	b) Television c) Mobile phones d) Internet based: used mainly for Internet based applications: Browsing, E-mail, Social Media, Recent advancements				

14. Cosmopoliteness

a) Frequency of visit to nearest town	**Score**
Twice or more in a week	
Once in a week	
Once in a month	
Seldom	
Never	
b) Purpose of visit	
All visits related to farming	
Some visits related to farming	
Other purposes	
No purposes	
c) Membership in organisation, outside the village	
Office bearer	
Member	
No membership	

15. Social participation

1.	Time spent for social activities
	On an average how much time do you spend for social activities (In hrs.)?
2.	Leadership competency
	Where will you place yourself in the leadership continuum with regard to your leadership attributes? Very low low medium high very high 1 2 3 4 5
	How do you utilize your level of competency of leadership in the welfare of society? Most often often seldom rare very rare 5 4 3 2 1
3.	Prosocial behaviour (Prosocial behaviour can be operationally defined as involvement in desirable activities for the welfare of community and society)
	How frequently do you participate in social/community functions (marriage, funeral, festivals in temples, church etc.,) Most often often seldom rare very rare 5 4 3 2 1
	Do you think you have the ability to understand the problem of others? Most often often seldom rare very rare 5 4 3 2 1
	How often you intervene in resolving the problems of others? Most often often seldom rare very rare 5 4 3 2 1
4.	Involvement in public speaking skills
	Where will you place yourself in the public communication skill continuum with regard to your public speaking skill? Excellent good fair poor very poor 5 4 3 2 1
	How often do you involve in public speaking? Most often often seldom rare very rare 5 4 3 2 1
5.	Interpersonal skills
	Where will you place yourself in the interpersonal communication skill continuum with regard to your capability in interpersonal communication as well as you in making interpersonal relationships? Excellent good fair poor very poor 5 4 3 2 1



16. SCALE OF PRACTICE OF INDIGENOUS AGRICULTURAL KNOWLEDGE

Sl.No:	Indigenous practices	Awareness		Use of practice		
		Aware	Unaware	Using	Partially using	not using
1						
2						
3						
4						

Details of each practices

1)
2)
3)

17. LABOUR WORK PARTICIPATION AMONG DIFFERENT OPERATIONS

Sl. No.	Operations	Extent of participation				
		Always	Frequently	sometimes	seldom	never
1	Land preparation					
2	Nursery management					
3	Transplanting					
4	Intercultural operations					
5	Water management					
6	Harvesting					
7	Post-harvest management					