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INDIGENOUS AGRICULTURAL PRACTICES OF ETHNIC TRIBAL PEOPLE IN AGALI - A MODEL OF SUSTAINABLE AGRICULTURAL IN KERALA

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ABSTRACT----------
Nature, the beautiful gift to human beings is to be protected and kept as sustainable as it is valuable for the coming generations and future life. The responsibility of protecting Mother Nature vests in each and every one and existing generation have to safely hand over the resources to the young ones as they are the caretakers of future. Land Utilization without exploitation plays a crucial role in sustainable development and our forefathers have provided proper guideline regarding the allocation of natural resources. The study reveals how the ethnic tribal population with their agricultural practices becomes a role model for the whole world in utilizing the natural resources and how they use agriculture as a main source of income for their livelihood. The utilization of natural resources without exploiting Nature and all living beings which dependent upon Nature is a proper model of allocation provided by Scheduled Tribes of Agali Panchayat in Palakkad District which have to be followed by all the descendants as well as cultivators. Land utilization by the tribals is a unique land use pattern with a strong bond between Nature and Man by being a part of achieving the Minimum Sustainable Goals.

KEY WORDS: *Nature, Land Use Pattern, Scheduled Tribes, Net Area Sown.*
JEL CODES: Q15; Q12; R22.----------

INTRODUCTION

Land, the primary factor of production acts as a platform for all the economic activities which contribute to the production process and with restricted supply along with excessive demand, human beings have intensive use of land itself. With the restricted supply of land, the human beings have to utilise it in the most possible manner to equalize it with the demand for it. Land includes all the area which is suitable for the human beings to live their life by properly utilizing the natural resources and through it, leading to the sustainable development of the whole world. "Land stands for all natural resources which yield an income or which have exchange value. It represents those natural resources which are useful and scarce, actually and potentially" (Fraser, 1937). Human beings use land and modify the land resources to meet their material, social and cultural needs often with detrimental impacts on the environment and human wellbeing (Helen Briassoulis, 2000). The Land Utilisation of Scheduled Tribes especially for agricultural purposes is unique with an exclusive character of love and affection for Nature as utilisation is done in a proper way and can be followed by others. Significance of the study arises from the fact that now a day, nature is exploited by the existing population and the concept 'sustainability' is only a far-to-be-attained objective.

Giri (1966) reveals the identification of the variability in land use categories is helpful to create policy measures which will help to rectify the imbalances and to stimulate changes to the directions which will be effective for the economy. The intense demand for land created a hindrance in the development of land for agricultural purposes and also the extension of land used, towards the forest through direct encroachments. The large increase in net sown area is contributed from utilisation of old fallows and cultivable waste lands which is a direct benefit to the agricultural income of the economy. Misra K Ashok et.al (2016) investigates the factors which will affect an individual's decision to enter farming after and / or while participating in an off-farm employment activity. The farmers in older generation find successors to take over their agricultural operations and it's a long standing traditional practice. The operator's age and educational attainment were significant factors in the decision whether they have to work off-farm prior to enter into farming. But the households including an elder member were more likely to enter farming rather than off- farming work to increase the household income.

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Fox A Thomas et.al (2017) analyses that Kerala has a bio- diversity hotspot with a high population density and a long history of complex agricultural land use patterns. The changing land use pattern is mainly due to declining profitability of agriculture in Kerala, labour shortages, unreliable weather, unfamiliar pests and diseases and the Government policies. Agriculture in Kerala is showing a declining trend, other land covers being cleared for roads and new buildings, less diverse agro- forests into paddy wetlands and a reported decrease in the cultivation of 80 percent of Kerala's primary crop species during 2003-2013.

Karunakaran (2013) analyses the trend in growth rates over the period 1960-61 to 2009-10 and the decadal growth rates of area, production and productivity of principal crops of Kerala. A heavy concentration of non – food crops reflects a changing cropping pattern in the agricultural scenario. The predominance of crops which are dependent on world market conditions and the dominance of perennial crops against annual or seasonal crops are the two main driving forces of changing cropping pattern.

METHODOLOGY

With the climatic relevance of natural and physiological features, Agali is popularized by the mode of cultivation and agriculture dependent population. The study focuses on 200 sample respondents who are farmers with an agricultural experience of more than five years and are dedicated to find their own source of income from agriculture. According to NSSO 70th Round Situation Assessment Survey of Agricultural Households in India, "Farmer is a person who possesses some land and is engaged in some agricultural activities on that land during last 365 days preceding the date of survey"(NSSO, 2013). The study is based on primary as well as secondary data sources. The Secondary Data is collected from Kerala Economic Review, State Planning Board, Land Use Board of India, Agali Panchayat Office and Central Statistical Organisation. Primary Data is collected on the basis of a structured Questionnare and direct interviews with Agali farmers. Descriptive Statistics as well as multiple regression analysis is used to analyse the relationship between variables. Hypothesis is tested using Multiple Regression analysis explaining the relationship between cause and effect variables.

$$AI_{i} = \alpha + \beta 1NFi + \beta 2YEi + \beta 3EDi + \beta 4NASi$$

where AI represents Agricultural Income of i individuals, i=1,2,3,4,……,n, α represents the intercept term, β_1, β_2, β_3 and β_4 represents the slope coefficients corresponding to the Causal variables such as - Number of Family Members (NF), Years of Experience (YE), Years of Education (ED), Net Area Sown,(NAS).

ANALYSIS AND INTERPRETATION

Based on the literature reviews, Land Use Pattern of Scheduled Tribes in Highlands are different from other Physiological Zones with some unique features and applications in agricultural activities. The study focuses on Scheduled Tribes in Agali Highlands of Palakkad District in Kerala. Scheduled Tribes, the ethnic groups of historically disadvantaged people are given recognition in the Constitution of India lays down the general principles for the affirmative action for the Scheduled Tribe. Scheduled Tribe means the tribes or tribal communities or part or groups within such tribes or tribal communities as are deemed under Article 341 and 342 to be Scheduled Tribes for the purposes of the Constitution. "Tribal population" means the members of the Scheduled Tribes declared under the Article 341 and 342 of the Constitution of India and they are known to be the descendants of the earliest inhabitants of India and hence called as "Adivasis" (NSSO 44th Round). Fifth Five Year Plan (1974-75) onwards, Government of India introduced Tribal Sub Plan and the Amendments in 1976, 2002, 73rd and 74th Constitutional Amendments paved the way for increased attention towards the development of Tribes as the subject was delegated to the three tier local Governments.

Tribal population resides mostly in Attappadi Block covering an area of 735 km^2 in Palakkad District in Kerala which also shares its boundary with Tamilnadu. The Attappadi Block consists of Agali, Puthur and Sholayar Panchayaths and the study focuses mainly on Agali Panchayat in which majority of Tribal people resides. The main source of income of tribal people in Agali is agriculture and allied activities as well as collection of minor forest produces extracted from natural forest resources such as honey, medicinal plants etc. The Tribal population find their livelihood from forest and keeps an intimate deep relation with the nature keeping in mind without the attainment of higher education fulfils the objective of sustainable development. By living in nature, keeping a fruitful relation with wild animals, they can give the rest of population a method or a way to how people can live nature friendly by utilizing the natural resources without exploitation of their own natural resources. Main communities belong to Irula, Muduga and Kurumba in which Irula is the most common or largest community in Agali. The term "irular" comes from word "irul" which means darkness since they follow strict rules and etiquette from Dravidian tribes found in Tamilnadu, Karnataka and Kerala. Kurumbas are the first adivasis to arrive in the area, Mudugas under the leadership of Kovai Moopens migrated from Coimbatore while irulas are the largest existing population in the tribal community. The tribal people believe that trees, mountains, streams, animals – all are creations of god and can be seen as manifestations of Divine and spirituality exists in the fact that Earth is God's mother and God cannot be bought or sold. Before sowing seed, Mannakaran leads the worship of Earth and

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agricultural activities such as sowing seed, planting, weeding and harvesting – all are done in joyous spirit. An investigation into their lifestyle and mode of living will help the rest of population in identifying their own responsibilities to land and nature and how they can attain self-sustainability especially in agriculture with the limited resources and how to live a worthful life without pollution, with strong co-operation by neglecting the social evils which are threat to a strong younger generation.

Protection of nature without exploitation is necessary for economy to attain the goal of sustainable development as nature has tenets and principles of its own, distinct, diversified cultures and limited resources. The tribal community always gives relevance to nature and keeps an important role in the protection of nature. So the intimate relationship between tribal community and nature is relevant for younger generations for whom it is necessary to have awareness about how nature is to be protected and how wild animals have to be given their own space (Shijitha M, Land Use Pattern in Kerala). Thus the study is an attempt to know about the agricultural activities of farmers belonging to Tribal Irula community of Agali Panchayat who still keeps strong bond with nature, considering nature as divine and Mother Earth have to be protected. Agali has an altitude of Type I – Altitude upto 500 m above MSL(Low altitude Zone, Hot Humid Tropics), Pattern I – Both the South-West and North- East Monsoon are active and moderately distributed South West Monsoon with June Maximum and Pattern II- Poorly distributed rainfall; Southwest Monsoon with July Maximum and concentrated in 3-4 months in North East Monsoon relatively weak(North of 110 N Latitude), while both the monsoons are available in Agali- Narrow valleys, Hills with steep gradients, Steep slopes. 90 percent of precipitation is during two monsoons – with 60 percent annual rainfall in June-Aug (Southwest) and 30 percent in Oct-Nov(Northeast). The main soil-type is Laterite and its variations especially with B horizon present and in Western Ghats with B horizon absent (Kissan Kerala, Government of Kerala).

The farmers in Agali always keep a deep intimacy with the agricultural land as they are cultivating on the hereditary property which is jointly owned by the members of joint family itself. So production is going on with a joint effort of all the family members rather than an individual and each and every one of family, in the younger age itself learns the basics of farming and become expertees. One of the specific features of the farmers is that those who are engaged in agricultural activities are illiterate and are large farmers with large sized highlands cultivating rice, banana and variety of rare pulses especially millets creating a millet village of its own. Though the agricultural income of people of Agali is dependent on a number of socio- demographic and economic factors, some variables are stagnant reflecting the similarities such as the population lives in Highlands having cultivation in their own hereditary property, main occupation being agriculture, cultivating in medium and large sized lands with size in between 4-10 hectares and more than 10 hectares respectively. They are living jointly and cultivate rice and varieties of pulses which are extinct or not familiar for others. The descriptive statistics of certain variables which will influence the agricultural income of people of Agali such as Net Area Sown, Years of experience as a farmer, Number of family members, Agricultural Income and Non-Agricultural Income is given in Table 1.

Table 1
Descriptive statistics of variables

Descriptive statistics	Net Area Sown (Ha)	Years of Experience	No:of Family Members	Agricultural Income	Non- Agricultural Income
Mean	9.16	35.52	5.91	489900.00	8859.00
Median	8.05	40.00	6.00	500000.00	3500.00
Mode	6.02	40.00	4.00	400000.00	0.00
Std. Deviation	3.76	9.27	2.22	161851.69	33749.85
Skewness	0.60	-0.64	0.08	-0.32	5.53
Kurtosis	0.08	-0.08	-1.06	-0.15	28.92
Range	16.01	35.00	8.00	720000.00	200000.00
Minimum	2.05	3.00	2.00	80000.00	20000.00
Maximum	18.06	57.00	10.00	800000.00	200000.00

Source: Primary Data Survey

The Net Area Sown by farmers in Agali ranges from 2.05 hectares to 18.06 hectares which is one of the large sized lands under cultivation when compared to other physiological zones. Only a small area is utilized for own settlements and all other area is utilized properly for agricultural purposes. The farmers are experienced for a long span of 15 to 50 years with the traditional agricultural methods, that is from their childhood itself along with parents and learnt to cultivate without exploiting the nature. The number of family members is also high ranging from 2 to 10 members as all of them still lives in joint family and each and every member is part of their earning.

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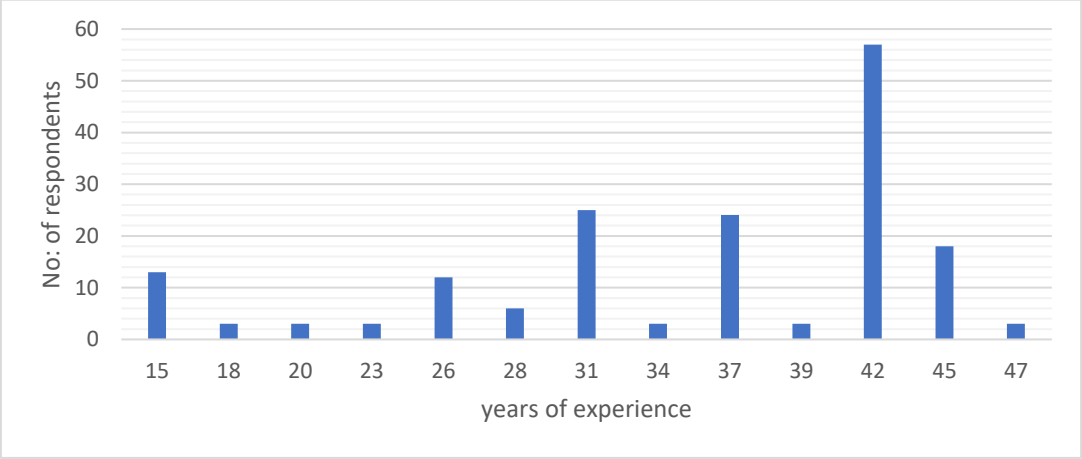
Main source of income is agriculture though they are doing some off- farm activities since agriculture is a seasonal occupation.

Farmers in Agali have long years of experience and are skilled agricultural labourers as farmers have a maximum experience of 57 years and the study reveals that still they are interested in cultivation due to preference of providing organic food to others and keep the traditional varieties which are suitable for cultivation rather than high yield variety seeds which are little more expensive and fertilizer-intensive. The relation between number of years and the frequency of respondents is given as graphical representation in Figure 1

Figure 1
Years of experience of farmers in Agali



The Figure depicts that the aged and experienced farmers are still interested in farming. As the experience increases, more respondents are still engaged in agricultural activities which prove that rather than younger aged people, the old aged are still interested in agricultural activities. The Government policy initiatives are more relevant as Government can rely and protect the traditional farmers and have to help young farmers to be continued in agriculture following the traditional and ethnic agricultural systems. Agriculture in Agali is also determined by different factors and the relationship is explained with the help of Hypothesis testing.

Hypothesis is tested using Multiple Regression analysis explaining the relationship between cause and effect variables.

$$AI_i = \alpha + \beta_1 NF_i + \beta_2 YE_i + \beta_3 ED_i + \beta_4 NAS_i$$

where AI represents Agricultural Income of i individuals, i=1,2,3,4,……,n, α represents the intercept term, $\beta_1, \beta_2, \beta_3$ and β_4 represents the slope coefficients corresponding to the Causal variables such as - Number of Family Members (NF), Years of Experience (YE), Years of Education (ED), Net Area Sown,(NAS). The study reveals that Agricultural Income of Tribal population is dependent upon causal variables such as Number of Family Members, Years of Experience, Years of Education and Net Area Sown. The Hypothesis related to the variables is given as

H_1: There exists a significant relationship between Agricultural Income and causal variables such as Number of Family Members, Years of Experience, Years of Education and Net Area Sown.

The relationship between Agricultural Income and Causal variables through Multiple Regression Analysis is given in Table 3

Table 3
Significance level of Agricultural Income and Causal Variables

Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	R Square	F
	B	S.Error	Beta				
(Constant)	406.40	45.82	…….	8.869	0.000	0.845	20.62 (0.00)
Number of Family Members	11.55	4.93	0.159	2.344	0.020		
Years of Experience	2.70	1.19	0.154	2.274	0.024		
Years of Education	-26.56	5.08	0.337	3.232	0.000		
Net Area Sown	13.16	2.78	0.305	4.739	0.000		

a. Dependent Variable: Agricultural Income
b.Predictors: (Constant), Number of Family Members, Years of Experience, Years of Education, Net Area Sown.

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The value of R2 equals 0.845 indicating that 84.5 percent of the variations in Net Area Sown are explained by the causal variables - Number of Family Members (NF), Years of Experience (YE), Years of Education (ED), Net Area Sown,(NAS). Multiple Regression Analysis shows that variables such as Number of Family Members, Years of Experience, Years of Education, and Net Area Sown have influenced their Agricultural Income. The Model can be represented as

$$AI = 406.40 + 11.55\ NF + 2.70\ YE - 26.56\ ED + 13.16\ NAS$$

t value = (8.869) (2.344)** (2.274)** (3.232)* (4.739)*

* Significant at 1 percent

** Significant at 5 percent

The results indicate that Number of family members, Years of experience and Net Area Sown positively influence Agricultural Income of Tribal people while Years of Education has an indirect impact on agricultural income. The positive signs of regressors such as Number of family members, Years of experience and Net Area Sown reflect the fact that an increase in the factors will increase the agricultural productivity as well as agricultural income, while the years of schooling shows a negative impact as they are attaining agricultural income through traditional methods that is followed by their forefathers. Net Area Sown is found to be the most important variable influencing Agricultural income followed by other factors. The Net Area Sown is categorized as Marginal Land which occupies more than 0.002 hectare and less than 1 hectares, Small Land which occupies more than 1 hectare and less than 2 hectares, Semi- Medium Land which occupies more than 2 hectare and less than 4 hectares, Medium Land which occupies more than 4 hectare and less than 10 hectares and Large sized lands which occupies more than 10 hectares (NSSO, Land and Livestock Holdings Survey Report, 2013)

The main purposes for which the owned land is utilised by the farmers are categorised as Built-up or Residential Area(BA), Land used for Government Infrastructure(GI), Net Area Sown or the Cultivated land(NAS), Area Sown More than Once(ASMO), Current Fallow(CF)- the land which is kept fallow during the current year, Fallows other than Current Fallow(FOCF) – the land which is kept fallow for more than one year and less than five years, Water Bodies(WB) which is used for irrigation purposes, Utilised Agricultural Area (UAA), Unutilised Agricultural Area(UnAA) and Gross Cropped Area(GCA), which is the summation of NAS and ASMO (Shijitha M, et.al 2023). The descriptive statistics of Land Use Pattern in Agali is given in Table 2.

Table 2

Descriptive Statistics of Land use pattern in Agali (in hectares)

	Minimum	Maximum	Mean	Std. Deviation
BA	0.01	0.03	0.02	0.005
NAS	1.22	7.29	3.90	1.52861
ASMO	0	0	0	0
CF	0	0	0	0
FOCF	0	0	0	0
WB	0	0	0	0
UAA	1.22	7.29	3.9059	1.52861
UNAA	0	0	0	0
TAGRI	1.23	7.31	3.9222	1.53145
GCA	1.22	7.29	3.9059	1.52861

Source: Primary Data Survey

The descriptive statistics provides data related to Land Use Pattern in Agali; the minimum area under Net Area Sown is 1.22 hectares while the maximum area used for Net Area Sown is 7.29 Hectares while the Current Fallows, Fallow other than Current Fallows and Unutilised Area do not exist in the particular area under study. The utilisation of land is properly done without any underutilisation or excessive exploitation of land. A share of total product is kept for animals and birds, a share is distributed among relatives, a share is kept for self-consumption and whatever is left out is sold outside, thus making it not purely commercial and profit oriented. The process is a model to cultivators as it makes the cultivation nature friendly and not a purely profit oriented cultivation. These indigenous agricultural practices can be followed by other farmers in highlands making it a model of agricultural development. Still in the old age, the farmers are ready to cultivate than the younger generations holding self-sufficiency in food production for their own use as well as for the others in order to keep them also healthy.

CONCLUSION

The Policy initiatives to be taken by Government must include protecting the farmers by providing irrigation facilities as the farmers have to depend on Bhavani river. Since Net Area Sown is the most important land use in

Kerala and a larger community is dependent upon the Net Area Sown, the farmers who are utilizing it for the benefit of themselves as well as for others, the proper utilisation of Net Area Sown through agricultural activities is necessary in Kerala economy. Diversity exists in crop cultivation according to the characteristics of Physiological Zones and farmers are playing their role in the most efficient manner, but some suggestions are required to improve the existing agricultural situation in the economy. Better utilisation of Net Area Sown is required to attain a long term stabilized agricultural growth for the creation of food security in the Economy. Attainment food security as a primary goal in Millenium Goals is attainable through a proper utilisation of Net Area Sown.

Though innovative agricultural practices are an initiative for high productivity along with short duration of harvesting and high yield, the quality and original fertility of soil is squeezed out by the new varieties. The old traditional way of cultivation with sowing of traditional seeds provides high nutritional value along with a protection of nature keeping the fertility of soil unaffected, keeping it safe for the younger generations with sustainable development and through it, the attainment of Minimum Goals.

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