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ABSTRACT

This study aims to describe free time for corn farmer households and their use for productive activities and assess the utilization of potential working days of corn farmer households.

It carried this research out in Gorontalo Province in 2019. The method used in this study was a survey method which was an empirical data collection based on questionnaires and interviews. This activity comprised secondary data surveys and primary data surveys. For sampling techniques used multistage purposive random sampling, ranging from sample districts, sub-districts, villages to respondent farmers. They sampled determination of respondents with a sample of 181 corn farmers. Data analysis used descriptive statistical analysis techniques by the presentation of tables, ratios and percentages.

The results showed that corn farmers owned the leisure time in one planting season 147 days which for productive activities in the agricultural sector by 54.97%, non-agricultural 11.97%, while the remaining 33.06% free time existing is not used. Meanwhile, Corn farmer households have a potential number of workdays 340 days, with a distribution of 56.76% which allocated to corn farming, 28.94% allocated to productive activities for farming outside of corn, 5.18% allocated to productive activities outside the agricultural sector and the remaining 14.29% is not used.

KEYWORDS: leisure time, the corn farmer, household, working days.

1. INTRODUCTION

The country's ability to use its agricultural production potential depends on the innovativeness of actors in the agricultural sector, farmers. The capacity of farmers and actors along the agricultural value chain to innovate in their production activities is contingent on the availability of technology (DeJanvry and Sadoulet, 2002; Evenson and Gollin, 2003).

Households are the smallest economic actors but the most important economic actors because all economic activities start from the household (Moser and Barrett, 2003). Production, distribution and consumption activities must involve one or several family members. Households in economic activities are the owners of production factors including labor, capital, expertise, land, and others. It carries the Production activities out by households to provide factors of production which needed by other economic actors by getting compensation. This also applies to corn farmers, it carries all productive activities out by farmers and their families which is a phenomenon of the household economy (Baruwadi, 2006).

In the household economic theory proposed by Chayanov, it stated that households must allocate time so they call the maximum use "subjective balance" because it is determined by specific preferences of the household. The stages put forward by Chayanov which will affect the amount of work allocation in the household, changes

in consumption, absolute income and income per capita. It applies if to corn farming, the existence of the farmer's household economy is related to the amount of work time allocation on corn farming. In allocating working time corn farmers will face the choice of allocating the time where they have to work or not work. They can identify many factors that can affect the allocation of time, one of which is the potential of the workforce and the free time which have in carrying out the main activities of corn farming (Minten and Barrett, 2008).

This study examines the economic phenomena of corn farmer households in terms of the utilization of free time owned by corn farmers. The research objectives are to analyze how much free time is owned by corn farmers and how to use the free time which owned by farmers for productive activities outside of corn farming.

2. LITERATURE REVIEW

Baruwadi (2006) suggests that people should make the choice to decide how they use the time. At a fixed amount of time, everyone should decide the allotment of time to work, the allocation of time for activity consumption and the allocation of time for rest. In the economic theory the household stated by Chayanov is mentioned that households should allocate time so that the maximum usability is called "subjective balance" because it is determined by a specific preference for households. Becker (1979) suggests its time allocation theory based on its theories: (1) households besides as consumers and producers; (2) goods that are consumed and manufactured by the household are not real goods and referred to as Z goods or consumables or basic commodities such as satisfaction or welfare of families/households; and (3) household as small factories in reducing the Z goods, combining capital goods, raw materials, labor and time. An empirical study of time allocation in countries that have developed in general examines the participation of a working force of women in marriage.

According to Becker someone will be ready to switch his free time to work not because the work produces direct utilities, but because needs as inputs in producing the Z item, where Z is the source of the utility. An increase in revenue derived from income will increase free time demand and reduce uptime. Conversely, if the increase in household income is due to rising wages, there will be two strengths that work towards the utilization of leisure time, namely the influence of income and the influence of substitution.

In the research on utilization of leisure time focused on various sources of income in the household income of farmers against the allocation of work time on corn farming. Assumed if the dependence of farmers against corn is high as a source of household income, the high income in corn farming will lead to reduction of uptime.

The income received by farmers from various sources also relates to the amount of working time allocated to the activity in question. On corn farming, the higher the income received, the higher working time allocated to corn farming. The reverse is also happening in revenues received outside of corn farming. If the income received from outside corn farming is higher than the working time allocated to corn farming is getting smaller. We can plan the time allocation of peasant household work for all activities as follows:

$$TATK = TKUK + TKUNK + TKNP$$

With restrictions:

TATK = Total time allocation of work

TKUK = time allocation for corn farming

TKUNK = allocation of working time for non-corn farming

TKNP = allocation of work time for non-farming

A variety of research related to labour and income in farming earned the results economic factors influence that labor allocation such as wages, land, commodity prices, job type, business objectives, comparative gains, and wealth. Other factors that also influence are physical and technical factors, characteristics of family and individual demographics such as several household members, age and education

3. RESEARCH METHODS

It carried this research out in Gorontalo Province. The object under study was the leisure time for corn farmers. To study the object of this study used a survey method which is an empirical data collection based on questionnaires and interviews. The data used in this study were primary data with the source of the data is corn farmers. Multistage random sampling did the sampling technique or sampling in stages, starting from the selection of sample districts, sub-districts, village to farm households. The sample of selected districts was Gorontalo Regency, while the sample of selected districts is Limboto and Telaga Biru. For the sample of villages selected 5 villages, namely: Tenilo, Tilihuwa, Modelidu, North Dulamayo and Tonalala. For the sample unit of farmers, it distributed 181 respondents in each village sample area using proportional allocation techniques. They analyzed the obtained data using descriptive statistical analysis through the presentation of data in the table form with data in the form of empirical data and percentages.

4. RESULTS AND DISCUSSION

Description of Corn Farmer Respondents

The description of the respondent showed that the characteristics of the corn farmers who were the research respondents. These characteristics included age, education, farming experience, number of family dependents, and area of arable land. The area of the research sample is Gorontalo District, with the sample villages / villages being Tenilo and Tilihuwa sub-districts in Limboto, and Modelidu Village, North Dulamayo Village and Tonalala Village in TelagaBiru Sub-District.

Age

Age is a factor that is quite decisive in the allocation of labor in a particular activity. Work productivity is closely related to a person's age so it determines the amount of labor that is poured out and the income generated. In the age of corn farming is a factor that is quite decisive in the expenditure of working time in various farming activities ranging from land management to postharvest. Therefore, the age of one of the determinants in the use of free time was owned by farmers. Descriptions of the average age of the respondents are presented in Table 1 below.

Table 1. The Age Average of Corn Farmers Respondents

No	Region		Total Respondent	Age (year)	
	Sub-district	Village		Average	Standard Deviation
1	Limboto	Tenilo	11	35.27	9.84
		Tilihuwa	24	45.38	9.85
<i>The average of Limboto</i>			35	42.20	10.81
2	Telaga Biru	Modelidu	28	41.6	13.44
		North Dulamayo	24	44.6	10.59
		Tonalala	94	38.5	9.81
<i>The average of TelagaBiru</i>			146	40.12	10.89
Gorontalo Province			181	40.52	10.87

Table 1 showed that the age average of farmers by region, TelagaBiru District has the highest average of age 44 with a standard deviation of 10.59, while the lowest average of age in Limboto District was 35 with a standard deviation of 9.84, or overall, the average of age of corn farmers in Gorontalo is 40 years. This shows that the average of age of corn farmers is quite productive.

Based on data, age is also an important factor influencing the probability of leisure time of corn farmers because it is said to be a primary latent characteristic in working decisions. However, there is contention on the direction

of the effect of age on farmers. Age was found to positively influence leisure time of corn farmers in Gorontalo (Adesiina and Baidu-Forson, 1995).

Education

The referred education in this study is the level of formal education which is undertaken by respondents ranging from elementary to tertiary education. Education owned by farmers is related to their intellectual abilities so that they can play a role in allocating their working time. Farmers who have a relatively higher level of education will have the ability to plan their work time allocation so that they have better opportunities to use their free time for productive activities. The condition of respondents according to their level of education is presented in Table 2 below.

The implication of this is that farm households with well-educated members are more likely to manage their time than those without. This is because educated members even bring home modern agricultural production technologies by working time on time, especially improved crop varieties and livestock breeds for relatives to adopt. This is consistent with the literature that education creates a favourable mental attitude for the acceptance of new practices especially of information-intensive and management-intensive practices (Waller *et al.*, 1998; Caswell *et al.*, 2001)

No	Region		Total Respondent	Level of Education (%)				
	Sub-district	Village		notpass SI (person)	SD (person)	SLTP (person)	SMU (person)	PT (person)
1	Limboto	Tenilo	11	0.0	45.5	18.2	27.3	9.1
		Tilihuwa	24	29.2	54.2	8.3	8.3	0.0
<i>Total of Limboto</i>			<i>35</i>	<i>20.0</i>	<i>51.4</i>	<i>11.4</i>	<i>14.3</i>	<i>2.9</i>
2	Telaga Biru	Modelidu	28	32.1	42.9	14.3	10.7	0.0
		North Dulamayo	24	25.0	50.0	16.7	8.3	0.0
		Tonala	94	26.6	57.4	11.7	4.3	0.0
<i>Total of Telaga Biru</i>			<i>146</i>	<i>27.4</i>	<i>53.4</i>	<i>13.0</i>	<i>6.2</i>	<i>0.0</i>
Gorontalo Province			181	26.0	53.0	12.7	7.7	0.6

Table 2 showed that in general, the education level of corn farmers in Gorontalo was not completed primary school and completed primary school of 79%. The remaining of 21% has a junior high school education. This situation will certainly affect the utilization of free time in corn farming. Education owned by Gorontalo farmers indicates that they will use their free time only on productive activities relating to their level of education.

Experience

Experience is the time of someone has spent in pursuing a particular field of work. The experience of corn growers is the time that has passed by corn farmers when starting corn farming until the time survey was conducted. Corn farmers who have a lot of experience will have an emotional attachment to corn farming activities, so that the devoted time will be more in managing corn compared to farmers with less experience. This situation will also influence the utilization of farmers' harvest time. On the other hand, experienced farmers can also allocate their working time more effectively so that they can use their free time for other productive activities. The experience of respondents of corn farmers is presented in Table 3.

*Table 3. Corn Farming Experiences of Farmer Respondents*

No	Region		Total Respondent	Experience (Year)	
	Sub-district	Village		Average	Standard Deviation
1	Limboto	Tenilo	11	11.09	7.20
		Tilihuwa	24	15.38	7.06
<i>Average of Limboto</i>			35	14.03	7.29
2	Telaga Biru	Modelidu	28	15.7	8.42
		North Dulamayo	24	13.4	7.60
		Tonala	94	14.7	7.33
<i>Average of Telaga Biru</i>			146	14.66	7.57
Gorontalo Province			181	14.54	7.50

Based on Table 3, the average range of experience of corn farmers in Gorontalo was 11.09 - 15.38 years, with an average experience of 14.54 years. This situation shows that Gorontalo Province corn farmers generally have enough experience in managing their farming, so that in allocating their working time to this farm will be quite effective.

The number of dependents

The number of dependents showed that the amount of family members the head of the household must finance that among clothing, food and other purposes. This study, a dependent corn farmer as the head of the household having children, wives and other families who live in the same house. The number of dependents in the productive age will be a source of labor that can help farmers in their farming activities. Therefore, this number of dependents is a variable that determines the allocation of the farmer's working time to corn farming and also determine the use of his free time for other productive activities. It presents the number of dependents of corn farmer respondents in Table 4 below.

Table 4 showed that the average of household load of respondent farmers by region in Limboto District had an average number of dependents of 3.89 people with a standard deviation of 1.08. Meanwhile, in TelagaBiru, the average number of dependents was 4.01 people with a standard deviation of 1.10.



Table 4. Average of dependency burden

No	Region		Total Respondent	The number of dependents (Person)	
	Sub-district	Village		Average	Standard Deviation
1	Limboto	Tenilo	11	3.45	0.82
		Tilihuwa	24	4.08	1.14
<i>Average of Limboto</i>			35	3.89	1.08
2	Telaga Biru	Modelidu	28	4.2	1.34
		North Dulamayo	24	3.9	1.12
		Tonala	94	4.0	1.01
<i>Average of Telaga Biru</i>			146	4.01	1.10
Gorontalo Province			181	3.99	1.09

Land Area

Land area is a factor that is very influential on farm production results because the greater the farm area, the greater the production results which is obtained. From the aspect of utilization of free time the more extensive corn land is managed by farmers which will cause the allocation of working time for corn to be greater so that the free time will also be smaller. The following is the state of the area of respondent corn farmers, as presented in Table 5.

Table 5. Average of Corn Farmers Land Area

No	Region		Total Respondent	The Land Area (Ha)	
	Sub-district	Village		Average	Standard Deviation
1	Limboto	Tenilo	11	0.73	0.40
		Tilihuwa	24	1.25	0.79
<i>Average of Limboto</i>			35	1.09	0.73
2	Telaga Biru	Modelidu	28	1.9	1.93
		North Dulamayo	24	1.2	0.66
		Tonala	94	1.4	1.00
<i>Average of Telaga Biru</i>			146	1.48	1.21
Gorontalo Province			181	1.41	1.14

Table 5 showed that the average of land area which was cultivated by corn farmers in Gorontalo Province was 1.41 ha. The highest average of land area which was owned by corn farmers in Modelidu Village was 1.9 ha, while the lowest was in Tenilo Village 0.73.

The Utilization of Leisure Time

Labor Potential

Labor potential is the workforce which is owned by farm households and is calculated based on work days equal to men and calculated in one planting season for corn farming (Limbless, 2018). In this study, it assumes one maize planting season for 5 months, with an effective day of 150 working days equivalent to Men or not including holidays, while 1 working day uses the assumption of 8 working hours. For the calculation of the potential workforce of corn farmer households, household members who are included in the working age and included as potential workers, namely: farmers as head of the household, wife and children. It calculates wide labor as 0.8 day men and equal men and children who can be converted to 0.5 Workers Day is equivalent to men. Based on the potential workforce owned by corn farmer households in one growing season, we can

calculate it that the potential work time is owned by corn farmer households. Table 6 presents the labor potential and potential work time possessed by corn farmers.

Table 6. Potential of Working Time of Corn Farmers Households

No	Region		Total Respondent	Corn farmers households	
	Sub-district	Village		Labors (HOKSP)	Potential of working time (HOK)
1	Limboto	Tenilo	11	2.10	315
		Tilihuwa	24	2.52	378
<i>Average of Limboto</i>			35	2.31	346
2	Telaga Biru	Modelidu	28	2.19	329
		North Dulamayo	24	2.28	342
		Tonala	94	2.21	332
<i>Average of Telaga Biru</i>			146	2.23	334
Gorontalo Province			181	2.26	340

Based on the table above, the average of the corn farmer household in Gorontalo had a potential workforce of 2.26 people, while the distribution between regions of the workforce potential ranges from 2.10 - 2.52 people. Based on this labor potential, the average of potential working time is 340 days in a planting season, while the distribution which based on the region is ranges from 315 to 378 workers days in one planting season. It gets this figure from the multiplication of a potential workforce with effective working days in one growing season.

We can see it that corn farmer households have a large enough time to be allocated to various activities depending on the farmers if to use the time to work. It relates the potential use of farmer labor to the household income of farmers. According to Becker in Baruwadi (2018) stated that to being a consumer and a producer household so that in the corn farmer household the use of its labor potential which will be influenced by the attitude of the farmer in positioning himself as a producer or consumer.

Working and Leisure Time

Working time of corn farmers is the allocated time for corn farming activities including land management, planting, fertilizing, pest and disease control, maintenance, harvesting and post harvest (Ommani, 2011). For the calculation of working time of corn farmers on all work activities is carried out by farmers and their families during one growing season which based on their potential workforce. It assumes potential work time that is not used for corn farming activities as leisure time. It presents working time on corn farmers in Gorontalo having spare time in Table 7.

Table 7. Allocation of Corn Farming Time and Leisure Time of Corn Farmers

No	Region Sub-district	Village	Potential of working time (HOK)	Working Time		Leisure Time	
				Total	%	Total	%
1	Limboto	Tenilo	315	202	64.13	113	35.87
		Tilihuwa	378	232	61.38	146	38.62
<i>Average of Limboto</i>			346	173	50.00	173	50.00
2	TelagaBiru	Modelidu	329	203	61.70	126	38.30
		North Dulamayo	342	124	36.26	218	63.74
		Tonala	332	161	48.49	171	51.51
<i>Average of TelagaBiru</i>			334	163	48.70	171	51.30
Gorontalo Province			340	193	56.76	147	43.24

The table 7 showed that the average of corn farmer households allocated their energy to work on corn farming for 193 working days of one planting season or 56.76% of the potential working time. Based on the region, the average of allocation of a farmer's household working time on corn farming was ranges from 124 to 232 working days per season or 36.26 - 64.13% of the potential working time in one planting season.

Based on the allocation of working time, the data was obtained from the results of the reduction in potential work days with time spent by farmers to work on corn farming. Based on the table above, the average of time was obtained by corn farmers which is 147 working days or 43.24% of the potential time, while based on the range of time spent in corn farming households was 113 - 218 working days, or 35, 87 - 63.74%. This shows that corn farming households have more working time percentage of corn farming than leisure time. This condition is in line with the opinion of Chayanov in Baruwadi (2018) which stated that households in allocating their work time were determined by specific preferences of households. This statement shows that in allocating work time of corn farmers have preferences that are determined by the characteristics of individual households.

The Utilization of Leisure Time

The use of free time in this study is free time outside of the corn farming activities which used by productive corn farmers, both in agriculture and outside agriculture. The productive activities in question are activities that provide income for corn farming households (Akudugu, *et al.*, 2012). Table 8 presents the utilization of leisure time of corn farmers' in productive activities in the agricultural and non-agricultural sectors.

Table 8. Allocation of Corn Farming Time and Leisure Time of Corn Farmers

No	Region Sub-district Non-	Village	Leisure time (HOK)	The utilization of leisure time (HOK)						
				Horti- Agri- Culture culture	Plantation	Livestock	Hodge	Total		
1	Limboto	Tenilo	130	2	31	30	2	65	33	
		Tilihuwa	97	19		2	52	8	81	27
<i>Average of Limboto</i>			<i>114</i>	<i>11</i>	<i>17</i>	<i>41</i>	<i>5</i>	<i>73</i>	<i>4</i>	
2	TelagaBiru	Modelidu	131	10		24	38	3	75	21
		North Dulamayo	191	28		1	49	5	83	0
		Tonala	217	11		5	61	9	86	24
<i>Average of TelagaBiru</i>			<i>180</i>	<i>16</i>	<i>10</i>	<i>49</i>	<i>6</i>	<i>81</i>	<i>12</i>	
Gorontalo Province			147	14	16	45	5	81	18	

The table 8 showed that free time of corn farmers had 147 days. There were 81 days which allocated for activities in the agricultural sector and 18 days of outside the agricultural sector. Activities in the agricultural sector include farming in the fields of horticulture, plantations, animal husbandry and farm laborers' activities, while outside of the agricultural sector activities are activities in the service sector such as drivers, artisans, and laborers. In addition, the fields of entrepreneurship and mining workers are also carried out by farmers in utilizing their time when not carrying out corn farming activities. In the farming sector, farming is an activity that is more utilized by corn farmers in utilizing available free time, where there are 45 days allocated for this activity, followed by 16-day plantation farming activities, 14day horticulture and farm laborers for 5 days. To compare the use of time for corn growers is more clearly seen from the percentage of each activity in the use of their free time, as presented in Table 9.

Table 9. Percentage of Utilization of Corn Farmers' Leisure Time in Productive Activities in the Agriculture and Non-Agriculture Sector

No	Region Sub-district Non-	Village	The utilization of leisure time (%)					Total
			Agricultural Sector		Livestock	Hodge	Agriculture	
			Horticulture	Plantation				
1	Limboto 25.38	Tenilo	1.54	23.85	23.08	1.54	50.00	
		Tilihuwa	19.59	2.06	53.61	8.25	83.51	
Average of Limboto 27.84								
Average of Limboto 3.52			9.25	14.54	36.12	4.41	64.32	
2	TelagaBiru 16.24	Modelidu	7.61	18.27	28.93	2.54	57.36	
		North Dulamayo	14.66	0.52	25.65	2.62	43.46	
		Tonala	5.07	2.30	28.11	4.15	39.63	
Average of TelagaBiru 11.06								
Average of TelagaBiru 6.67			9.09	5.56	27.44	3.21	45.30	
Gorontalo Province 11.97			9.39	10.61	30.48	3.27	54.97	

Data from Table 9 showed that corn farmers used their free time for activities in the agricultural sector. There were 54.97% which was used for the agricultural sector and the remaining 11.97% for activities outside of the agricultural sector. Thus, there is a free time that is not used for productive activities by 33.06%. By region, the range of leisure use of corn farmers in the agricultural sector was the 39.63 - 83.51%, while outside of the agricultural sector comprised 0.00 - 27.84%. This data shows that there are areas where corn farmers do not use their time at all for activities outside the agricultural sector. The area in question is north Dulamayo where the village has difficult accessibility because it is they locate it in a highland area so that business opportunities outside of the agricultural sector are less available.

Potential of Farmers' Working Time Distribution

Potential of corn farmer labors as described earlier is the workforce owned by farm households which is calculated based on working days and equal to men in one planting season while the potential of the working day is the number of working days in a maize growing season which multiplied by the potential of the farmer's household labor. Regarding free time, the distribution of potential work time needs to be revealed so that they know the allocation of farmer household workers based on their potential. Table 10 presents the distribution of working time owned by corn farmer households.

Table 10. Distribution of Potential Working Time of Corn Farmers Households

No	Region Sub-district	Village	Total of working day (HOK)	The allocation of working day (%)			
				The utilization of leisure time		Total	
				Corn- remaining cultivation	Agriculture	Non- Agriculture	time
1	Limboto 26.99	Tenilo	315	43.49	19.58	9.94	29.52
		Tilihuwa	378	28.57	24.62	8.21	32.83
Average of Limboto 38.60							

[Baruwadi, *et al.*, 8(11): November, 2019]ICTTM Value: 3.00

<i>Average of Limboto</i>			346	50.00	21.35	1.17	22.51
27.49							
2	TelagaBiru	Modelidu	329	70.93	22.53	6.38	28.91
0.16		North Dulamayo	342	58.19	26.35	0.00	26.35
	15.46						
		Tonala	332	55.20	22.75	6.35	29.10
	15.70						
<i>Average of TelagaBiru</i>			334	61.44	23.50	3.46	26.97
11.59							
Gorontalo Province			340	56.76	23.76	5.18	28.94
14.29							

Table 10 described that from the potential day which owned by corn farmer households was 340 days which 56.76% of distribution is allocated to corn farming, 28.94% of productive activities for farming outside of corn, 5.18% of productive activities outside the agricultural sector and the remaining 14.29% was not used. By region, there are villages where corn growers maximize the time which they have to work such as Model Village. It relates this to farmers in this village maximize the working days which they have allocated to work on corn farming around 70.93%. The free time is also used, that was allocated 22.53% for the agricultural sector and 6.38% for the non-agricultural sector, leaving only 0.16% of the unused time. There are also areas that do not make the most of their potential workdays such as Tilihuwa village. The magnitude of potential untapped days in the region was 38.60%. It relates the difference between regions in utilizing the potential working days to the amount of earned income by farm households. Farmers will use the potential working days as much as if it derives the income from corn farming which is still lacking. If the income is they consider the income sufficient, the corn farmers will not take advantage of the potential working days and choose not to work.

5. CONCLUSION

Based on the results of research and discussion can be concluded that

1. The spare time which by corn farmers in one planting season is 147 days, which is used for productive activities in the agricultural sector amounted to 54.97%, non-agricultural 11.97%, while the remaining 33.06% of free time available is not used.
2. Corn farmer households have a potential number of working days of 340 days, with distribution of 56.76% allocated to corn farming, 28.94% allocated to productive activities for farming outside of corn, 5.18% allocated to productive activities in outside the agricultural sector and the remaining 14.29% is not used.

REFERENCES

- [1] Akudugu, M.A., Guo, E., Dadzie, S.K. (2012). Adoption of Modern Agricultural Production Technologies by Farm Households in Ghana: What Factors Influence their Decisions?. *Journal of Biology, Agriculture and Healthcare*, 2(3), 1-14.
- [2] Adesiina, A.A. & Baidu-Forson, J. (1995). Farmers' perceptions and adoption of new agricultural technology: Evidence from analysis in Burkina Faso and Guinea, West Africa. *Journal of Agricultural Economics*, 13, 1-9.
- [3] Baidu-Forson, J. (1999). Factors influencing adoption of land-enhancing technology in the Sahel: Lessons from a case study in Niger. *Journal of Agricultural Economics*, 20, 231-239.
- [4] Baruwadi, M. (2006). *Household Economy*. UNG Press. Gorontalo Province.
- [5] Caswell, M., Fuglie, K., Ingram, C., Jans S. & Kascak C. (2001). Adoption of Agricultural production practices: Lessons learned from the US. Department of Agriculture Area Studies Project. US Department of Agriculture, Resource Economics Division, Economic Research Service, Agriculture Economic Report No. 792. Washington DC.
- [6] DeJanvry, A., & Sadoulet, E. (2002). World poverty and the role of agricultural technology: Direct and indirect effects. *Journal of Development Studies*, 38(4), 1-26.



- [7] Evenson, R., & Gollin, D. (2003). Assessing the impact of the Green Revolution: 1960 to 2000. *Science*, 758-762.
- [8] Elembilassery, V. (2018). Organizing Informal Labor in India: Alternate Perspectives. *The Indian Journal of Industrial Relations*, 53(3), 437.
- [9] Moser, C., & Barrett, C. B. (2003). "The disappointing adoption dynamics of a yield increasing, low external input technology: The case of SRI in Madagascar. *Agricultural Systems*, 76(3), 1085-1100.
- [10] Minten, B., & Barrett, C. B. (2008). Agricultural technology, productivity, and poverty in Madagascar. *World Development*, 36(5), 797-822.
- [11] Ommani, A.R. (2011). Productivity of energy consumption in agricultural productions: A case study of corn farmers of Ahwaz Township, Iran. *African Journal of Agricultural Research*, 6(13), 2945-2949.
- [12] Waller, B.E., Hoy, C.W., Henderson, J.L., Stinner B., & Welty C. (1998). Matching innovations with potential users: A case study of potato IPM practices. *Agriculture, Ecosystems and Environment*, 70, 203-215.

