RESEARCH ARTICLE

PROFILE OF RURAL UNI-DIMENSIONAL AND MULTI-DIMENSIONAL POVERTY BY HOUSEHOLD CHARACTERISTICS: THE CASE FROM KUYU DISTRICT, CENTRAL ETHIOPIA.

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Manuscript Info	Abstract
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Understanding the profile of poverty is a pre-condition for effective public action to alleviate poverty in rural area of Ethiopia. The major Objective of this study was to look into profile of Rural Poverty by Household Characteristics in Kuyu District. In order to attain this objective, relevant data were collected through structured interview. The generated data were computed through bivariate analysis of rural Uni-dimensional and Multi-dimensional poverty profile by FGT indices (Incidence, Depth and Severity of poverty) in terms of the socio-economic and demographic characteristic of the household in Kuyu district. The bivariate analysis of rural poverty profile indicated that three FGT poverty measure (Uni-dimensional and Multi-dimensional index) are becoming worse as number of the household members, Female-male ratio, and dependence ratio increases in Kuyu district. Three FGT poverty indexes of Computed Uni-dimensional and Multi-dimensional poverty shows that poverty is decreasing with increasing number of oxen, number of livestock, and size of farm land belongs to the households in Kuyu district. Three FGT poverty index of Uni-dimensional and Multi-dimensional poverty also shows that poverty is more severe among age sub-group of 20 to 29 years, non-formally educated household heads, households without vocational training, households not access to health service, households who take their sick household members to traditional healer, households who do not use fertilizer, and households who do not using improved seed for their farm in Kuyu district. Our final conclusion is that effort should be made to improve these socio-economic and demographic factors to alleviate rural poverty of Kuyu district.

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Introduction:-
Background of the study:-
There is a range of views on the conceptualization of poverty. Some definitions are closely associated with income/consumption expenditure poverty and others are related with multi-dimensional poverty. Income poverty is based on basic need approach while Multi-dimensional poverty is based on basic capability approach (World Bank ,2000; Cruz *et al.* ,2015; Ncube *et al.*,2015; Beegle *et al.*,2016; Ferreira *et al.*,2016).

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1318

In having different extents, Poverty has existed for a very long time and it remains worldwide social immoral in this 21st century (FAO, 2015). Though poverty is worldwide social problem, it is the most challenging and pressing public concern in many developing countries. In the world, the highest inhabitants living in extreme poverty are found in Africa. Hence, the regional share of residents living in extreme poverty is high in African continent. According to the evidence, 47.9 percent of population is living in extreme poverty in this continent (Ncube, *et al.,* 2015). Regardless of being second largest continents in the world and having 54 countries, the combine gross domestic product (GDP) of Africa is about 15 times less than the GDP of the USA and about 7 times less than the current GDP of china (Teshome and Quiacoe, 2014). They add that the inappropriate development strategies and institutional weakness are claimed to be one of the main factor for poverty in many African countries.

Statement of the Problem:-
Ethiopia is one among sub-Saharan African countries facing extreme poverty. Poverty is pervasive in Ethiopia as a great portion of its population lives below \$1.90/ a day (OPHI, 2016). Despite of fast economic growth in the past decade, poverty happens ubiquitous in Ethiopia that makes the country among the poorest in the world. Recentl*y,* Ethiopia is among the low-income countries in the world with GDP per capita of \$1608 in PPP terms in 2017 and ranked 164 out of 187 countries (World Bank, 2017). It is obvious that it is hardly possible to use poverty assessment results carried out elsewhere in the country for other areas due to the fact that the country is differentiated with diverse socio-economic settings, and agro-ecological zones. Even, regional poverty analysis results are rarely used by other districts as the households may differ in their socio-cultural contexts and livelihood strategies being pursued. This is because the term poverty still means different things for different people that challenge any interveners. Therefore, in order to grasp a more comprehensive picture of poverty and understand its full dimensions, we turned our attention from national levels of poverty, to the local level of poverty and put the light on the humanitarian and household aspects of poverty.

Based on all above concepts, sound and deep poverty research analysis was carried out in Kuyu Woreda (district) to support over all national development programs. Because, Kuyu Woreda (district) is one of identified highest food insecured declared woreda (district) since 2005 (MoARD, 2006) and continued to be food insecured declared woreda in 2017(MoARD, 2017). If the poor and their problems are to be identified more clearly, then they must be asked what they think and given the opportunity to express their needs as they see realities. Hence, by targeting different problem, several researches were carried out in Kuyu district. But these studies left with gab, because none of these researches were identifying profile of Uni-dimensional and Multi-dimensional poverty to the level the researchers designed to analyze poverty in the area. This research gap predictably calls for the need to go deep into the analysis of rural poverty so that it will support the on-going poverty reduction program of the country (GTPII).

Objective of the study:-
The objective of the study was to analyze Profile of rural poverty (Multi-dimensional and Uni-dimensional poverty) by Household Characteristics in the study area.

Research Methodology:-
Location of Kuyu district:-
Kuyu Woreda/district is one of the180 Woreda/district s in the Oromia regional state of Ethiopia and also one among 13 Woreda/district in North shoa/selale/. It was established as independent Woreda/district in 1933 E.C. This Woreda/district is about 42 km from Fiche and 155km away from Addis Ababa on the way. The administrative city of Kuyu Woreda/district is Garba Guracha. Astronomically, it is located between $9^035'$ and $9^059'$ N latitude, and between $38^003'$ and $38^031'$E longitude. In relative terms woreda is located North of Ada'abarga and Meta robi, East of Gindeberet, South of Warajarso, south west of HidabuAbote and West of Dagam. See the following figure.

Population of Kuyu district:-
Based on the figure published by the central statistical agency estimation in 2015, Kuyu Woreda/district has total population of 152,366 of whom 75,523 are men and 76,843152 are women. 123,130 or 80.81% of its population are rural dwellers. According to the same source, with an estimated area of 950.75km^2, Kuyu district has an estimated population density of 160.3 people per square kilometer which is proportionate to zone average of 172.2 people per square kilometer. The inhabitants of this district is mostly believe in orthodox (92.6%), followed by protestant (5.9%), traditional believers (1.06%), Muslim (0.35%), Catholic (0.03%), and finally other believers (0.06%).

Research design:-
Quantitative and qualitative methodologies tend to differ in their epistemological and ontological foundations Johnson and Onwuegbuzie and Leech (2007).Nevertheless, to Bryman, (2009), the differences in the epistemological beliefs shouldn't prevent a qualitative researcher from utilizing data collection methods associated with quantitative research and vice versa. Mixed research methods is the kind of research where the researcher combines quantitative and qualitative techniques, methods and concepts in a single study or series of related studies during single or multiple phases within a pragmatic philosophical worldview (paradigm) and theoretical lenses that direct the plan for conducting the study (Onwuegbuzie and Leech, 2007;Greene ,2007 ;Niglas, 2009).whereas Johnson and Onwuegbuzie and Leech (2007) and Johnson (2007) have argued that the fundamental principle of mixed methods research is that multiple kinds of data should be collected with different strategies and methods in ways that reflect complementary strengths and non-overlapping weaknesses, allowing a mixed methods study to provide insights not possible when only qualitative or quantitative data are collected.

In keeping to the pragmatist perspective and with regard to study that deals with poverty, the mixed methods approach was deemed the most appropriate (World Bank, 2005). Likely, the researcher found a mixed research, combining both quantitative and qualitative approaches, more appropriate for the current research. This practice, according to Kim (2003), ensures intellectual coherence and quality control. Hence, mixed method research combined qualitative (inductive theory) and quantitative (deductive theory) approaches to provide methodological triangulation to study social setting (Tashakkori and Teddlie 2008).

Data Types and Sources:-
This study was designed based on both quantitative and qualitative data types which were gathered from both primary and secondary sources. Primary data was collected from sample rural households by means of structured interview with the help of enumerators. Before the actual survey, the interview schedule was written in English and then translated to its corresponding *Afan Oromo* version for ease of data collection. Field trips were made before the start of the actual survey to pretest the questionnaire on selected rural kebeles. For pretesting purpose, some household heads outside the sample households was interviewed. After incorporation of modifications, the final version of the questionnaire used to gather the data from rural households relevant for the study was prepared. Continuous supervision of the process was made to correct possible errors on the spot. Secondary data was also obtained and utilized from various sources such as reports of district agricultural bureau, zone report and regional reports on issues associated with rural households and rural poverty.

Methods of Data Collection:-
Structured interview:-
According to Kothari (2008) information obtained by means of questionnaires is free from bias as the person conducting the research cannot influence the respondents hence accurate and valid data can be obtained. They are also cheaper, easier to administer and convenient as the respondents are given time to fill in the questionnaires. So, the schedule interview is the principal source of the data gathering tools in this research more than the other. It was designed to both close and open ended question by English language and translated to Afan Oromo for the sample respondents aiming for the clarity. Then the scheduled interview was accessed to sampled household by enumerator to gather both qualitative and quantitative data, which is assumed to relevant to the problem under study.

Method of Data analysis:-
In this study, due attention was given to distribution of poor households to different degree across attributes of demographic and socio-economic characteristics of rural households. Hence, poverty was decomposed to different attributes of demographic and socio-economic characteristics of rural households to detect specific social group live in poverty. To achieve this, FGT poverty measures (both in Uni-dimensional and multi-dimensional poverty) was used. In this study the Multi-dimensional poverty reveals a hidden face of poverty that may be overlooked if we consider only its monetary poverty aspect and vice versa. Here our focus was to detect and identify where the poorest households concentrated than comparing scoring result of Uni-dimensional and multi-dimensional poverty index.

FGT index:-
Identification of poverty in the Uni-dimensional context normally proceeds by setting a poverty line corresponding to a minimum level below which one is considered poor. In this analysis, household consumption expenditure towards food and non-food item were considered and compared to National poverty line of Ethiopia (7184.00 Birr

per adult equivalent per year). In this regard, Foster Greer Thorbecke (FGT) poverty measures were used to identify profile of poverty in Kuyu District. Three indicators that emerge from this measure are: the headcount ratio that indicates the prevalence of poverty, the poverty gap that measures the average depth of poverty across the households, and the squared poverty gap that emphasizes the conditions of the poorest of the poor.

a. Head Count Index (HCI)

$$HCI = \frac{m}{n}$$ --9

Where;
HCI= head count index
m= number of poor population,
 n = total population

b. Poverty Gap Index (PGI) or Total poverty gap index (TPG)

$$TPG = \left(\frac{1}{n}\right)\sum_{i=1}^{m}\left(\frac{z - y_i}{z}\right)$$ --10

Where;
TPG=Total poverty gap
m= number of poor population,
n = total population,
z= poverty line,
yi =income of i-th poor person

c. Severity of poverty

$$SPG = \left(\frac{1}{n}\right)\sum_{i=1}^{m}\left(\frac{z - y_i}{z}\right)^{2}$$ ----------------------------11

Where;
SPG=squared poverty gap
m= number of poor population,
n = total population,
z= poverty line,
yi =consumption expenditure of i-th poor person

Multidimensional poverty index (MPI):-
In addition to Uni-dimensional poverty index mentioned above, Multi-dimensional poverty measurements were also used to display deep and more depended able information about poverty profile of rural households of Kuyu District as discussed below. To facilitate presentation of the main arguments of this paper, we adopt largely the same notation as in Alkire and Foster (2011) that justifies a natural extension of the Foster Greer Thorbecke poverty measures (referred to as AF methodology for Alkire Foster) from Uni-dimensional measures to Multi-dimensional poverty measures. And the AF measures have an analogous structure to Uni-dimensional poverty measures. It uses a counting approach to identifying 'who is poor' by considering the range of deprivations they suffer, and combines this with the Foster-Greer-Thorbecke (FGT) methodology that is the most widely used class of consumption poverty measures. Hence, for this study, the aggregation step of our methodology builds upon the standard FGT technology and likewise generates a parametric class of measures. Each FGT measure can be viewed as the mean of an appropriate vector built from the original data and censored using the poverty line.

Result and discussion:-
Decomposition of Poverty by Households Characteristics in Kuyu District:-
Before discussing the decomposition of the rural poverty by household characteristics, it is necessary to present the estimate of the rural poor using the FGT indices based on our household level survey data. As shown in Table 1, the prevalence of poverty among the surveyed households in Kuyu district is 0.5722 values representing 57.22 percent of the poor rural households and also multi-dimensional head count ratio is 0.7384 values representing 73.84 percent of the poor in the study area. Similarly as indicate in Table 1, the poverty depth is 0.3081values representing 30.81percent whose consumption expenditure is below the poverty line. This gap represents the average amount of consumption expenditure required to bring poor households below the poverty line up to the poverty line. On the other hand, as Depth of poverty by Multidimensional deprivation is summarized and presented in Table1 below, the

average poor households are deprived in 0.5041value representing 50.41 percent of the weighted indicators. Additionally, the severity of poverty index is 0.0949 values which represent the 9.49 percent poorest among the poor from households who require the attention of policy maker in the distribution of basic needs in Kuyu district. Multidimensionally, households in Kuyu district are deprived in 37.22 percent of the total potential deprivation they could experience overall.

Table 1:-Poverty estimate of the rural households in Kuyu district

Poverty measures	FGT Poverty estimate	
	Uni-dimensional poverty	Multi-dimensional poverty
Poverty incidence	0.5722	0.7384
Poverty depth	0.3081	0.5041
Severity of poverty	0.0949	0.3722

Source:-Survey result, 2017

Next, we looked at Decomposition of poverty by household characteristics like Family size ,Female-male ratio, Age of household heads ,Dependence ratio, Education level of Household heads, Households Vocational training, Households access to health service, Managing sick families, Access to fertilizers ,Improved seed, Number of oxen per household ,Livestocks per household and farm land distribution as computed below by FGT indices in Kuyu district.

Decomposition of poverty by Households family size:-
The decomposition of poverty by households family size of Kuyu District is given in the Table 2 by Uni-dimensional and Multi-dimensional poverty index. Hence, Uni-dimensional poverty index shows those households having one and two members in family size are not Uni-dimensionally poor. Other sub-group of households having three and more member family size is with different value of poverty in Kuyu District. The maximum percentage of poverty is examined in households having 10 and above family members with 0.1863 of poverty severity, 0.4317 depth of poverty that accounted about (0.931) 93.1 percent poor household by Uni-dimensional poverty index.

We also found that the households having 10 and above members are with 0.5253 of poverty severity, 0.6093 depth of poverty that accounted about (0.8621) 86.21 percent poor households by Multi-dimensional poverty index. By Multi-dimensional poverty index, households having one member in family size are not Multi-dimensionally poor. As shown in the Table 2, Multi-dimensional poverty index detectes poverty among households having two household members with 50 percent incidence of poverty, 36.67 percent poverty gap and 18.33 percent severity of poverty which is hidden side of Uni-dimensional poverty index.

From this, we pointed out that Uni-dimensional and Multi-dimensional poverty is worst among the households having family size of 10 and above household members in the Kuyu district. But, households having one and two household member size are escaped from incidence, depth and severity of Uni-dimensional and also one household member size are escaped from incidence, depth and severity of Multi-dimensional poverty in Kuyu district.

Table 2:- Decomposition of poverty by Households family size in Kuyu district

Number of household members	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
1	-	-	-	-	-	-
2	-	-	-	0.5000	0.3667	0.1833
3	0.182	0.1079	0.0117	0.6364	0.3048	0.1939
4	0.436	0.1319	0.0174	0.7692	0.4778	0.3675
5	0.500	0.2606	0.0679	0.6719	0.5070	0.3406
6	0.522	0.2499	0.0625	0.6522	0.4726	0.3082
7	0.597	0.3118	0.0972	0.7361	0.5094	0.3750
8	0.511	0.3647	0.1330	0.7872	0.5126	0.4035
9	0.853	0.4295	0.1844	0.8824	0.5167	0.4559
10 and above	0.931	0.4317	0.1863	0.8621	0.6093	0.5253

Source:-Survey result, 2017

Decomposition of poverty by Households Female-Male Ratio:-
Table 3 shows, the perusal of data that concerned with the decomposition of the poverty by households female-male ratio in Uni-dimensional and Multi-dimensional poverty index. Those households who have 2.00 and above Female-male ratio have the highest incidence of poverty(75.76 percent), depth of poverty (32.88 percent) and severity of poverty(10.81 percent) by Uni-dimensional poverty index. The relative lower sub-group of female-male ratio accounted lover poverty based on Uni-dimensional poverty index. As shown in Table 3, we also calculated the highest poor household in 2.00 and above female–male ratio with 67.20 percent depth of poverty and 50.91 percent severity of poverty through Multi-dimensional poverty index.

Both Uni-dimensional and Multi-dimensional poverty index presented in the Table 3 also shows that incidence, intensity and severity of Uni-dimensional and Multi-dimensional poverty is becoming high as female –male ratio increasing in the Kuyu district. This means, Uni-dimensional and Multi-dimensional poverty is worse when female are becoming higher in household members than male in Kuyu district

Table 3:-Decomposition of poverty by Households Female-Male Ratio in Kuyu district

Female-Male ratio	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
0.000-0.999	0.7068	0.2948	0.0869	0.7068	0.5079	0.3590
1.000-1.999	0.7203	0.3121	0.0974	0.7203	0.5780	0.4163
2.000 and above	0.7576	0.3288	0.1081	0.7576	0.6720	0.5091

Source: - Survey result, 2017

Decomposition of poverty by Age of Household heads:-
The Table 4 shows, the result of decomposition of poverty by age of household heads that are estimated through Uni-dimensional and Multi-dimensional poverty index in Kuyu district. The estimate of Uni-dimensional poverty index indicate that the highest incidence of poverty (75 percent), depth of poverty (42.70 percent) and severity of poverty (18.23 percent) is observed in household heads age sub-group of 20 to 29 years. Likely, the estimate of Multi-dimensional poverty index produced in Table 4 also show that 81.25 percent Multi-dimensionally poor households are observed in households heads age sub-group of 20 to 29 years with 70 percent depth of poverty and 56.88 percent severity of poverty in the Kuyu district.

From both Uni-dimensional and Multi-dimensional FGT indices, Table 4 also shows that incidence, intensity and severity of Uni-dimensional and Multi-dimensional poverty are high among the household heads age sub-group of 20 to 29 years in the Kuyu district. From this we pointed out that Uni-dimensional and Multi-dimensional poverty is worst among the household heads age sub-group of 20 to 29 years in the Kuyu district.

Table 4:-Decomposition of poverty by Age of Household heads in Kuyu District

Age of the household heads	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
20-29	0.7500	0.4270	0.1823	0.8125	0.7000	0.5688
30-39	0.6533	0.3126	0.0977	0.7867	0.5017	0.3947
40-49	0.5476	0.3129	0.0979	0.7698	0.4893	0.3767
50-59	0.5581	0.2811	0.0790	0.6860	0.4949	0.3395
60 and above	0.5000	0.2183	0.0477	0.6719	0.4937	0.3317

Source:-Survey result, 2017

Decomposition of poverty by Households Dependence ratio:-
The decomposition of the poverty by households dependence ratio in Kuyu District through Uni-dimensional and Multi-dimensional poverty index is produced in Table 5. The results are different across the sub-group of households dependence ratio in the given FGT indices. The sub-group of households (2.00 and above) have highest 89.29 percent of poverty incidence, 38.84 percent of poverty gap and 15.08 percent of poor of the poor by Uni-dimensional poverty index. Decomposition of poverty by households dependence ratio computed via multi-dimensional poverty index has the same trend with Uni-dimensional poverty index. Hence, high concentration of

poor households (89.29 percent) was computed in 2.00 and above household dependence ratio with 54.53 percent depth of poverty and 48.69 percent severity of poverty by Multi-dimensional poverty index.

Based on computed FGT indices in Table 5 below, incidence, depth and severity of Uni-dimensional and Multi-dimensional poverty is becoming worse as households dependence ratio increasing. This means Uni-dimensional and Multi-dimensional poverty is becoming worst as households dependent members increasing in the Kuyu district.

Table 5:- Decomposition of poverty by Households Dependence ratio in Kuyu district

Dependence ratio	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
0.000-0.999	0.6970	0.2861	0.0819	0.6970	0.4983	0.3473
1.00-1.999	0.7850	0.3538	0.1252	0.7850	0.5044	0.3959
2.00 and above	0.8929	0.3884	0.1508	0.8929	0.5453	0.4869

Source: - Survey result, 2017

Decomposition of poverty by Education level of Household Heads:-
We have carried out Uni-dimensional and Multi-dimensional poverty index based on educational achievement of household heads as presented in the Table 6 below. The result of Uni-dimensional poverty index indicated that the incidence of poverty, depth of poverty and severity of poverty are worst among non-formally educated household heads with 57.81 percent, 41.69 percent and 13.32 percent respectively. The result of Multi-dimensional poverty index also indicate that incidence of poverty(83.85 percent),depth of poverty(51.76 percent) and severity of poverty(43.40 percent) are worse among Non- formally educated household heads in Kuyu district.

From all Uni-dimensional and Multi-dimensional FGT indices presented in Table 6, Uni-dimensional and Multi-dimensional poverty is more severe among non-formally educated household heads in Kuyu district.

Table 6:-Decomposition of poverty by Education level of Household Heads in Kuyu district

Educational achievement of Household heads	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
Non-formal education	0.5781	0.4169	0.1332	0.8385	0.5176	0.4340
Primary school(1st -4th)	0.5765	0.3148	0.0991	0.6588	0.4976	0.3278
Primary school(5th -8th)	0.5652	0.2459	0.0605	0.6087	0.4770	0.2903
Secondary school(9th and 10th)	0.5625	0.2889	0.0835	0.6250	0.4067	0.2542
Secondary school(11th and $12^{th)}$	0.4000	0.2333	0.0772	0.6000	0.4333	0.2600

Source: - Survey result, 2017

Decomposition of poverty by Households Vocational training:-
The decomposition of poverty by households vocational training is produced in the Table 7 below via Uni-dimensional and Multi-dimensional poverty index. The results through Uni-dimensional poverty index clearly indicate that incidence of poverty (76.82 percent), depth of poverty (3.41 percent) and severity of poverty (9.86 percent) is high among the sub-group of households with no vocational training in Kuyu district. The highest Multi-dimensionally poor households (76.82 percent) also is detected in sub-group of households having no-vocational training with high depth of poverty (31.41 percent) and severity of poverty (9.86 percent) in Kuyu district.

This indicates that incidence, depth and severity of Uni-dimensional and Multi-dimensional poverty is more severe among the sub-group of the households who did not take vocational training in the Kuyu district. This means, rural households fell under Uni-dimensional and Multi-dimensional poverty when they do not take vocational training in Kuyu district.

Table 7:- Decomposition of poverty by Households Vocational training in Kuyu district

Vocational training	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
NO	0.7682	0.3141	0.0986	0.8069	0.5168	0.4170
YES	0.2313	0.2739	0.0750	0.6194	0.4751	0.2943

Source: - Survey result, 2017

Decomposition of poverty by Households access to health service:-
Decomposition of poverty by household access to health service via FGT indices are presented in Table 8. The households who do not access to health service are Uni-dimensionally poor with 85.28 percent incidence of poverty, 34.37 depth of poverty and 11.81 percent severity of poverty. Among this sub-group, the highest percentage of households who are Multi-dimensionally poor are found in households with no access to health service having 53.21 percent poverty gap and 44.07 percent severity of the poverty.

This shows, those households who do not access to health service are endowed with more incidence, depth and severity of Uni-dimensional and Multi-dimensional poverty in Kuyu district. This means, rural household fell under Uni-dimensional and Multi-dimensional poverty when they do not access to health service in Kuyu district.

Table 8:-Decomposition of poverty by Household access to health service in Kuyu district

Access to health service	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
NO	0.8528	0.3437	0.1181	0.8282	0.5321	0.4407
YES	0.3480	0.2385	0.0569	0.6667	0.4762	0.3175

Source: - Survey result, 2017

Decomposition of poverty by the way Households manage sick family:-
The result of decomposition of the poverty by the way households manage their sick household members are given in Table 9 via FGT indices (Uni-dimensional and Multi-dimensional poverty index). The highest percentage of poverty incidence (71.70 percent) is concerned with the households who take their sick household members using traditional healer having 40.95 percent depth of poverty and 16.77 percent severity of poverty by Uni-dimensional poverty index. The households in this sub-group are also founded with high incidence of poverty, depth of poverty and severity of poverty via Multi-dimensional poverty index.

From this all information, we understand that the household who are taking their sick household members to traditional healer are endowed with high incidence, depth and severity of Uni-dimensional and Multi-dimensional poverty in the Kuyu district.

Table 9:-Decomposition of poverty by the way Households manage sick family in Kuyu district

Managing sick family	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
Do nothing than praying	0.5217	0.3391	0.1150	0.7391	0.5667	0.4188
Took to health center	0.5190	0.2547	0.0649	0.6878	0.4855	0.3339
Brought drug from shop	0.6852	0.3718	0.1382	0.8333	0.5059	0.4216
Took to traditional healer	0.7170	0.4095	0.1677	0.8679	0.5449	0.4730

Source: - Survey result, 2017

Decomposition of poverty by Households access to fertilizers:-
Household accesses to fertilizers in Kuyu District among the poor households are calculated and FGT results are given in Table10. Poor households that have no access to fertilizers are 75.41 percent with 35.89 percent poverty depth and 12.88 percent poor of the poor in Uni-dimensional poverty index. Among this sub-group, the highest Multi-dimensionally poor households are identified with78.69 incidence of poverty, 52.88 percent depth of poverty and 41.61 percent severity of poverty.

These indicate that incidence, depth and severity of Uni-dimensional and Multi-dimensional poverty is high among the households who do not access to fertilizer in Kuyu district. This means those rural households who access to fertilizers are in better living standard than who do not access to fertilizers in Kuyu district.

Table 10:- Decomposition of poverty by Household access to fertilizers in Kuyu district

Access to fertilizers	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
NO	0.7541	0.3589	0.1288	0.7869	0.5288	0.4161
YES	0.4816	0.2685	0.0721	0.7143	0.4905	0.3503

Source: - Survey result, 2017

Decomposition of poverty by state of Households in using improved seed:-
Household poverty level by using improved seed are identified by Uni-dimensional and Multi-dimensional poverty index as given in Table11 below. 69.95 percent of poor households do not use improved seed for their farm land having maximum value of poverty intensity (0.3596) and severity of poverty (0.1293) by Uni-dimensional poverty index. The estimate by Multi-dimensional poverty index reveal that the highest poor household(75.96 percent) is found in the sub-group of households who do not use improved seed with value of 0.5415 depth of poverty and 0.4113 severity of poverty.

This shows that incidence, depth and severity of Uni-dimensional and Multi-dimensional poverty is more high among the rural households who do not use improved seed for their farm land in Kuyu district. This means, rural households who are using improved seed for their farm land are in better wellbeing in Kuyu district.

Table 11:- Decomposition of poverty by state of Household in using improved seed in Kuyu district

Improved seed	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
NO	0.6995	0.3596	0.1293	0.7596	0.5415	0.4113
YES	0.4457	0.2279	0.0519	0.7174	0.4646	0.3333

Source: - Survey result, 2017

Decomposition of poverty by Number of oxen belonging to households:-
Poverty indicators based on number of ox holding of households are computed and presented in Uni-dimensional and Multi-dimensional poverty index (Table12). In terms of Uni-dimensional poverty index, the severity of poverty and depth of poverty is 13.74 percent and 37.07 percent in that order with 97.44 percent incidence of poverty among sub-group of household who do not have ox. On side of Multi-dimensional poverty index, highest percentage of poverty incidence (87.18 percent), depth of poverty (59.51 percent) and severity of poverty (51.88 percent) is also associated with households who do not have ox in Kuyu district.

From given Uni-dimensional and Multi-dimensional FGT indices in Table12, we observed that incidence of poverty, depth of poverty and severity of poverty is increasing as number of ox belongs to household decreasing in the study area. This shows that Uni-dimensional and Multi-dimensional poverty is relatively less among the households having relatively high number of ox in the Kuyu district.

Table 12:- Decomposition of poverty by Number of oxen belonging to households in Kuyu district

Number of oxen	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
0	0.9744	0.3707	0.1374	0.8718	0.5951	0.5188
1	0.9028	0.3538	0.1251	0.8056	0.5259	0.4236
2	0.5391	0.2951	0.0871	0.7813	0.4897	0.3826
3 and above	0.2969	0.1745	0.0304	0.6172	0.4671	0.2883

Source: - Survey result, 2017

Decomposition of poverty by Number of livestock belonging to households:-
Poverty decomposition based on number of livestocks in TLU belongs to rural households are computed in Uni-dimensional and Multi-dimensional poverty index (Table13). The highest percentage of poverty incidence, depth and severity are associated with sub-group of household owning number of livestocks 0.00 to 3.100 in TLU. Hence, 87.68 percent are poor households whose sub-group of households lies between 0.00 to 3.100 numbers of livestocks in TLU having 36.42 percent depth of poverty and 13.26 percent severity of poverty in Uni-dimensional poverty index. On side of Multi-dimensional poverty index, maximum poverty severity (45.05 percent) and intensity (54.53 percent) is found among sub-group of household owning 0.00 to 3.100 livestock in TLU with highest incidence of poverty (82.61 percent) in Kuyu district.

The FGT indices of Uni-dimensional and Multi-dimensional poverty index presented in Table 13 reveals that incidence, depth and severity of Uni-dimensional and Multi-dimensional poverty is become decreasing with increasing number of livestocks belongs to households in the Kuyu district. This shows that Uni-dimensional and Multi-dimensional poverty is worst among the households having less number of livestocks in Kuyu district.

Table13:- Decomposition of poverty by Number of livestocks belonging to households in Kuyu district

Number of Livestocks in TLU	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
0.00-3.100	0.8768	0.3642	0.1326	0.8261	0.5453	0.4505
3.200-6.300	0.5324	0.2690	0.0723	0.7554	0.4822	0.3643
6.400 and above	0.1667	0.0920	0.0085	0.5778	0.4577	0.2644

Source: -Survey result, 2017

Decomposition of poverty by Farm land size belonging to households:-
Decomposition of poverty by farm land size of the households in Kuyu district is presented in the Table14 by Uni-dimensional and Multi-dimensional poverty index. The Table 14 indicates that 70.91 percent sub-group of households owning farm land size 0.5 to 1.75 hectares are characterized by poor housholds with 38.16 percent poverty gap and 14.56 percent poverty severity by Uni-dimensional poverty index. On another side, 85.45 percent households are multi-dimensionally poor with 55.07 percent depth of poverty and 47.06 percent severity of poverty within same sub-group of household having farm land size of 0.5 to 1.75 hectares in Kuyu district.

From both Uni-dimensional and Multi-dimensional FGT indices, Table 14 also shows that incidence, intensity and severity of Uni-dimensional and Multi-dimensional poverty are becoming less as size of farm land belongs to the households are increasing. From this, we come to understand that Uni-dimensional and Multi-dimensional poverty is becoming less severe as households owning more land in the Kuyu district.

Table 14:- Decomposition of poverty by Farm land size belonging to households in Kuyu district

Farm land size in hectares	Uni-Dimensional poverty index			Multi-dimensional poverty index		
	Incidence of poverty	Depth of poverty	Severity of poverty	Incidence of poverty	Depth of poverty	Severity of poverty
0.5-1.75	0.7091	0.3816	0.1456	0.8545	0.5507	0.4706
1.76-3.01	0.5556	0.2488	0.0619	0.7222	0.5070	0.3661
3.02-4.27	0.4500	0.2413	0.0582	0.6833	0.4732	0.3233
4.27 and above	0.4930	0.1903	0.0362	0.6338	0.4733	0.3000

Source: - Survey result, 2017

Conclusion and recommendation:-
1. Uni-dimensional and Multi-dimensional poverty index indicate that Uni-dimensional and Multi-dimensional poverty is worst among the household having family size of 10 and above household members in the Kuyu district. Hence, all concerned stake holders including Government and non-governmental organization have to give due attention to incidence of poverty, depth of poverty and severity of poverty among deprived group of rural household to reduce poverty through related promotion and protection policy in the study area.
2. Both Uni-dimensional and Multi-dimensional poverty index shows that the incidence of poverty, depth of poverty and severity of poverty is more severe among household age sub-group of 20 to 29 years, non-formally

educated household heads, households without vocational training, households who do not access to health service, households who take their sick household members to traditional healer, households who do not use fertilizer, and households who do not using improved seed for their farm in Kuyu district. Hence, all concerned stake holders including Government and non-governmental organization have to give due attention to incidence of poverty, depth of poverty and severity of poverty among deprived group of rural households to reduce poverty through related promotion and protection policy in the study area.

3. Computed Uni-dimensional and multi-dimensional index shows, incidence of poverty, depth of poverty and severity of poverty is decreasing with increasing number of oxen, number of livestock, and size of farm land belongs to the households in Kuyu district. Hence, all concerned stake holders including Government and non-governmental organization have to give due attention to incidence of poverty, depth of poverty and severity of poverty among deprived group of rural households to reduce poverty through related promotion and protection policy in the study area.

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