Full Length Research Paper

Livelihood diversification strategies among men and women rural households: Evidence from two watersheds of Northern Ethiopia

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This study was conducted to examine livelihood diversification strategies among men and women farm households in Begasheka and Debrekidan watersheds of Northern Ethiopia. The essential data were collected from 182 farm households. Descriptive statistics and Binary Logistic Regression Model (BLGM) were deployed to analyse the data. Three groups of livelihood strategies with eight sub-livelihood strategies were identified in the study areas including farming, off-farm and non-farm. The result of the study revealed that gender affects diversification options, the choice of income-generating activities due to culturally defined roles, social mobility limitations and differential ownership of working capital and access to assets. Based on the present study, it was possible to infer that the constraints of the rural households in choosing livelihood strategies that will lead them to achieve food security goal should not be put aside since food security problem cannot be overcome by simply concentrating on the farm sector alone; inter-sectorial issues, farm and non-farm linkages need to be addressed as well. Moreover, the contribution made by off-farm and non-agricultural sector to rural households is significant; obviously these activities are targeted for survival. In addition, the significance of gender issue indicates the decision to livelihood choices and as such public policy should be informed by analyses of how different livelihood choices are conditioned by gender issue. Thus the next interesting research question would be to analyze how gender issues affect the amount of income generation implications of different livelihood choices' practices.

Key words: Gender, farm, off-farm, non-farm, male households, female headed households.

INTRODUCTION

Diversification of income sources, ownership of assets, and occupations are the norm for individuals or households for different socio-economic reasons. The literature on diversification tends to categorize livelihood sources as either farm or non-farm. The latter is often implicitly being taken to be non-natural resource based activities such as trading, construction, service industries, etc. Households and individuals are motivated for different reasons in diversifying assets ownership and income generating activities.

The first set of motives could be in one of the following and usually known as "push factors": risk reduction, response to diminishing factor returns in any given use, such as family labor supply in the presence of land constraints driven by population pressure and landholdings fragmentation, reaction to crisis or liquidity constraints, high transactions costs that induce households to self-provision in several goods and services, etc. The second set of motives comprise "pull

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factors": realization of strategic complementarities between activities, such as crop-livestock integration or milling and hog production, specialization according to comparative advantage accorded by superior technologies, skills or endowments, etc (Christopher et al., 2001).

Other experts have identified in Sub-Saharan Africa that diversification can be represented as a failure of agriculture as means of providing livelihood for a substantial proportion of rural inhabitants. They express diversification in Africa as an active process of 'de-agrarianization' whereby farming becomes a part-time, residual, or fall-back activity and livelihoods become increasingly oriented to non-farm and non-rural activities (Bryceson, 2005).

According to renowned institutions like DFID, FAO, UNDP, etc., livelihood approach resources can be categorized as: (a) human capital (skills, education, health), (b) physical capital (produced investment goods), (c) financial capital (money, savings, loan access), (d) natural capital (land, water, trees, etc.), and (e) social capital (networks and associations) (Ellis, 1998, 2000).

These days, there is growing interest to address in recognizing the existing difference of rights and responsibilities that men and women often have with respect to access and control over resources. And the right to benefits derived from the use of improved technologies and decision making. Empirical observations have shown that men and women are faced by differentials access to inputs, new technologies, education, healthcare and other-resources. Furthermore, it has been recognized that both gender and household based approaches are useful frameworks for targeting policy interventions in rural areas. The transfer and adoption of agricultural technology in particular and the productivity of agriculture in general is affected by who decides what to produce, when to produce and how much to produce.

The issues of livelihood strategy with respect to gender arise from the need to understand and design research results that equally benefits for both women and men of a given community that enhance development prospects of a given nation. Despite this fact, data disaggregated by gender are still poorly developed (UN, 2001). In like manner this has been visible by the study carried out by Ellis and Mdoe (2003) in Tanzanian, in which elucidated diversity of income sources seem to be prevalent among different classes. In such study, the nature of income diversification differs greatly between better off and poorer households. The better off tend to diversify in the form of non-farm business activities (trade, transport, shop keeping, brick making, etc.) while the poor tend to diversify in the form of casual wage work, especially on other farms (Elis and Edward, 2004).

Similarly, in Ethiopia a study on the livelihood diversification of pastoral communities found out that in both pastoral and semi-agro-pastoral communities, the contribution of livestock and livestock products to the household's income is the highest for the rich and smallest for the poor owing to the size of livestock they hold. The livelihood of the pastoralists diversified into crop production, petty trades, casual work, remittance, firewood selling, charcoal production and incense collection (Kejela et al., 2005).

In the Ethiopian context the typical rural livelihood strategy is whether men and women headed households combine crop and livestock production. The second strategy is engaging in off-farm and non-farm income-generating activities (Devereux, 2000). Obviously diversification plays significant positive roles such as reducing the adverse effects of mismatch between uneven farm income streams and continuous consumption requirements, spreading out risks among variety of activities, creating employment opportunity, etc. However, there are also risks associated with diversification, one of which is understanding gender issue in relation to agricultural production because it excludes women from decision making role in rural development. Many experts pointed out that the existences of differences in livelihood choices participation varies from men and women. Hence, this paper is aimed at addressing such knowledge and development gaps in this particular research targeted areas. Specifically this paper explores the livelihood strategies and their contribution in one particular year, and identifies the major livelihood strategies of women and men as well as their underlying determinants.

METHODOLOGY

The study area

The study was conducted in Debrekidan (D/kidan) and Begasheka (B/shekha) watersheds which are found in the Hawzen Woreda (Eastern zone) and Kolla Temben Woreda (Central zone) respectively. D/kidan watershed is located about 90 km away from Mekelle city and about 9 km to the East of the Wereda town of Hawzen. B/sheka watershed is located about 95 km away from Mekelle city and about 9 km to the West of the Wereda town of Abi-adi. D/kidan watershed has a total population of 1977 of which 788 are male and 850 are female. The total farming households of the watershed are 349 where 260 are male headed and the remaining 89 are female headed households. The total population of B/sheka is 2970 where the male and female populations are 1449 and 1529, respectively. The total farming household in B/shekha is 663, among which 511 are male headed households and 153 are female headed households.

Sampling techniques and methods of data collection

For the quantitative survey, stratified random sampling technique was employed in order to select sample

farmers from both watersheds. The stratification was based on gender (male and female headed households). A sample frame of each stratum was prepared from the long-list of farming households of the respective watersheds with the help of development agents. The number of male headed and female headed households included in the sample was fixed purposively to be almost equivalent. Generally, a total sample of 84 and 98 respondents were taken from D/kidan and B/sheka watersheds, respectively. From D/kidan watershed, the numbers of male and female headed households in the sample were 43 and 41 respectively, while equal size of both male and female respondents was taken from B/sheka which is 49 each.

Both secondary and primary sources of information were used in order to exhaustively assess all relevant information related to the research topic. The secondary sources were books, journals, web sites, reports, etc. The primary information was collected through formal survey using structured questionnaire, and PRA tools using checklists tools, such as key informant discussion, were applied to undertake the informal survey. Following the PRA, a detailed formal survey which was managed by well trained enumerators under the close supervision of the research team was conducted to collect detail qualitative and quantitative data at household level from both watersheds.

Methods of data analysis

Both qualitative and quantitative methods were employed to analyze the data. Using descriptive statistics, data obtained from the sample households were compared and contrasted. Descriptive statistics such as percentage and frequency of occurrence were employed to participation in livelihood options. In order to compare the influence of the explanatory variables on participation, mean, standard deviation, frequency of occurrences, cross-tabulation and percentage were computed independently for each livelihood options. In addition, t-test and chi-square test were used to test the significances of continuous and discrete variables respectively, taking into account the objectives of the research under consideration.

Binary Logit model was employed per each livelihood options, since it was believed to offer better explanation on underlying relationship between the decision to participate in livelihood options and its determinants independently (Greene, 1997). Participation in livelihood option refers to the decision made by individual farm households during 2008/2009.

The dependent variable in this case is dummy (Yi), which takes a value of:

Y off-farm = 1 if a given HH participate in off-farm, otherwise 0.
Y non-farm = 1 if a given HH participate in non-farm, otherwise 0.

RESULTS AND DISCUSSION

Gender division of labour, access and control resources

There is still labor division among men and women in the farm and household activities. In male headed household, farm activities such as land clearing, ploughing, sowing, threshing, harvesting are dominantly undertaken by men whereas the household activities are carried out by women. However in female headed households except ploughing, women are also actively involved in all farm activities. In both watersheds, a woman ploughing is still considered as taboo.

Almost all household items are managed by women while farm tools are controlled by men. Women (housewives) have equal decision making role in household resource management. They can equally decide as men on what to sell, purchase, sending children to school, how much to save, etc. But, most often women need not to consult men to sell animal products such as butter, egg and chicken.

Women have equal right in owning land. In the early 1988, land was redistributed equally to all female above 18 and male above 20 years old. Female children are mostly engaged in household routine activities in support of their mother whereas boys involve in herding, ploughing and other farm activities. In the time of divorcing, the wife will have an equal share as to the husband for the resources under the household.

The importance of off-farm and non-farm income for landed households

The dominant livelihood strategy in the two watersheds is mixed farming type while off-farm activities like unskilled labour, gathering of wild fruits and fire woods, and safety net are also the second important livelihood options which represent a very low cost, low return niche occupied by poor households. Non-farm activities like handcrafts, petty trade and remittance are also important livelihood options. The level/intensity of farm, off-farm and non-farm participation vary both in location/ physiographic and gender of the household head. In the two watersheds, more than 98% of the respondents were farm participants (Table 1). Farm is mandatory for all sampled farmers of D/kidan and for 94% of B/sheka community. Moreover, farm engagement varies in gender of the household head in B/sheka, the proportion of FHHs were lower (91.8%) than MHHs (98%).

The share of farm income was also higher in D/kidan (65%) than in Begasheka (68%) which also vary with gender of the HH (Table 2). In this regard, the result for the two watersheds is mixed; farm share was higher in MHH in D/kidan and lower in FHH.

The level of off-farm participation is higher in B/sheka (82.7%) than D/kidan watershed (78.6%). In terms of gender, female participation is high in D/kidane than

Table 1. Farm, off-farm and non-farm participation in inter and intra watershed.

Variable	Community	MHH (%)	FHH (%)	Aggregate (%)
Off-farm	D/kidane	69.8	78.5	78.6
	B/sheka	83.7	81.6	82.7
	Pooled	77.2	84.4	80.8
Non-farm	D/kidane	20.9	36.6	28.6
	B/sheka	18.4	32.7	25.5
	Pooled	19.6	34.4	26.9
Crop based	D/kidane	100	100	100
	B/sheka	98	91.8	94.9
	Pooled	99	97	98

Source: Field Survey (2007).

Table 2. Income share of farm, off-farm and non-farm in inter and intra watershed.

Livelihood	Community	MHH (%)	FHH (%)	Aggregate (%)
Farm	D/kidane	71.4	64	68
	B/sheka	66	65	65
	Pooled	68.7	64.5	66.5
Off-farm	D/kidane	25	29	27
	B/sheka	29	23	26
	Pooled	27	26	26.5
Non-farm	D/kidane	5	6.8	6
	B/sheka	5	12	9
	Pooled	5	40	7.5

Source: Field Survey (2007).

B/sheka. In general, 80.8% of the sampled population participate in off-farm activities in which female participation exceeds by 5% than their counterparts. Off-farm accounts for 26.5% of the total annual income with slightly higher share in D/kidan. The share was mixed in both watersheds in terms of gender of the household head in which D/kidan MHH has numerically higher share than FHH in B/sheka.

The levels of non-farm engagements also vary with location and gender of the household head. In general, 26.7% of the respondents were non-farm employed. Of the total respondents, 34.4% of the FHH and 19.6% of MHH of the two watersheds engaged in non-farm activities with slightly higher percentage in D/kidan watershed. The shares of non-farm engagements also vary with location and gender of the household head. In this regard, 40% of the FHH annual income and 5% of the MHH annual incomes are obtained from non-farm activities. But the income share of FHH of B/sheka (12%) was higher than that of D/kidan (6.8%) watershed.

Annual off-farm income represents 42, 36, 21 and 9% for the poorest, poor, less poor and better off male headed households, respectively for Debrekidan farmers which is statistically significant along the income categories (F=3.11, p<5%). For B/sheka, of the total annual income, annual off-farm income composes/represents 56, 45, 24 and 18% for the poorest, poor, less poor and better off MHH, respectively and is statistically significant (F=4.31, p<1%). For female headed households, annual off-farm income represents 30, 37, 14 and 7% for D/kidan while it represents 18, 22, 27 and 17% for B/sheka for the poorest, poor, less poor and better off wealth categories respectively, which is statistically significant for D/kidan at F=3.37, p<5% and non-significant for B/sheka at F=0.87, p<5%. In most cases, majority of the off-farm income (>20%) is represented from safety net and food aids while wage followed by gathering represents the rest in decreasing

Table 3. Determinants of off-farm livelihood choices.

Variable	MHH		FHH		Pooled	
	B	Exp (B)	B	Exp (B)	B	Exp (B)
Wereda (1 = D/K, 2 = B/heka)	-2.7***	0.07	0.651	1.918	-1.9***	0.15
Gender (1 = Male, 0 = Female)					-1.2***	0.29
Schooling	0.116	1.123	0.202	1.223	-0.02	0.98
Farming experiences (years)	0.05	1.05	-0.1***	0.89	0.017	1.02
Family size (number)	-.294*	0.745	-0.065	0.937	-.206*	0.81
House type (1 = iron, 0 = grass)	-0.69	0.502	0.111	1.118	-0.272	0.76
Total cultivated land (ha)	.422**	1.525	-0.166	0.847	.314**	1.37
Oxen (number)	-0.389	0.678	0.36	1.433	0.291	1.34
Use of herbicides and fertilizer	1.224	3.402	-1.061	0.346	0.119	1.13
Participation in development groups (1 = participate, 0 = not participate)	-0.549	0.578	-1.6***	0.202	-0.073	0.93
Members of farmers organization (1 = Yes, 0 = No)	-0.217	0.805	-0.252	0.777	-0.354	0.70
Frequency of participation extension (number)	.041***	1.042	0.024	1.024	.021*	1.02
Wealth status (1 = better off, 0 = poor)	1.402*	4.064	-2.719**	0.066	1.359**	3.89
Constant	-2.244	0.106	5.36***	213.72	-1.19	0.30
X^2	33.228***		24.02***		50.78***	
-2loglikelihood	94.312***		76.085***		185.84***	

order (Appendix Table 1).

Gender based determinants of off-farm livelihood choices

The participation of male and women head households in off-farm livelihood diversification is analyzed econometrically in Table 3 as a function of human, physical and social capitals. The two dominant off-farm activities are unskilled labourer and gathering (of wild fruit and fuel woods). As household rarely specialized in only one off-farm activity, we use binary logistic model where no participation in off-farm work was the choice comparison.

Human capital factors

Factors like gender of the household head, experience in farming and family size affect participation in off-farm activities for male and women head households.

Gender of the household head

In this study, gender of the household head is found to negatively and significantly (P= 0.01) influence diversification into off-farm activities implying that women household heads have a much higher likelihood of participation than their men counterparts. Thus, keeping the influence of other factors constant, the likelihood of FHHs choice of non-farm livelihood strategy increases by

29% and the opposite is true for the MHH counterparts. This could be perhaps due to the income and opportunity limitation to participate in other livelihood option and the easy accessibility of these activities in the locality of FHH and vice-versal for MHHs.

Farming experience

It has negative and significant influence on off-farm engagement for WHH function (P=1%); the probability of engagement in off-farm decrease by 89% with one year increase in experience of the women household head, whereas for MHH, farming experience has positive but non-significant influence. This implies that younger FHHs tend to engage on off-farm than older ones. Perhaps this could be due to the limited exposure of older people and the requirement of intensive works for such activities. Besides the cultural barriers, the older ones are very reluctant to engage in such activities within their own vicinity as they consider themselves inferior in their status.

Family size

It plays a role in MHH and the entire sample in off-farm participation functions. Result showed that increase in family size has significant and negative influence on choice decision of off-farm livelihood strategy for the MHH and pooled functions (p=10). Overall, with increase in family size by one unit, the likelihood participation in

Table 4. Determinants of non-farm livelihood choices.

Variable	MHH		FHH		Pooled	
	B	Exp (B)	B	Exp (B)	B	Exp (B)
Wereda (1)	1.508**	4.516	0.651	1.918	0.910**	2.484
Gender (1)	-	-	-	-	1.335**	3.801
Schooling	0.363***	1.437	0.202	1.223	.232***	1.261
Experiences	0.002	1.002	-.119***	0.888	-.050***	0.951
Family	-0.138	0.871	-0.065	0.937	-0.021	0.979
Hhtp	0.968	2.632	0.111	1.118	0.622	1.862
T-cultivated	-0.162	0.851	-0.166	0.847	-0.052	0.949
Oxen	0.166	1.181	0.36	1.433	0.164	1.179
Herfert	-1.784	0.168	-1.061	0.346	-.928*	0.395
Devgrp	-0.648	0.523	-1.597***	0.202	-1.108***	0.33
Frog	1.302**	3.675	-0.252	0.777	.876*	2.4
Frequency	-0.032	0.968	0.024	1.024	-0.011	0.989
Wealth (1)	-0.905	0.405	-2.719**	0.066	-1.057*	0.347
Constant	0.498	1.646	5.365	213.721	0.535	1.707
X^2	25.701***		33.94***		50.78***	
-2Loglikelihood	65.25***		49.66***		161.25***	

off-farm activities decreases by 81%. Perhaps this could be due to the engagement in farm and other remunerative activities in households with higher family sizes.

Physical capitals

Factors like location or district where the respondent is residing, land size and wealth status of the household affect participation in off-farm activities.

In MHH and the entire sample functions, geographic location has negative and significant influence on *Debrekidan* settlers, and conversely for *Begasheka* settlers, location has positive influence; this could be due to the natural resource endowment related factors as the former is relatively wet zone.

Total cultivated land size

It plays a role in off-farm participation. Land holding size has positive and significant influence in off-farm participation for male headed households and the entire sample functions (p< 5%). Perhaps households with better holding opted for additional income in casual labourer works to smoothen their farm operations.

Household wealth status

It also affects off-farm participation inconsistently for the three functions. For male headed households and the entire sample functions, wealth status has positive influence on off-farm participation decision at less than 10 and 5% probability level. Conversely, for female headed

households, wealth status has negative and significant influence on off-farm engagement at less than 5% probability level. Perhaps this could be due to the weak attention of households with better off ability in complimenting off-farm with farming activities or in livelihood diversification and vice-versa, as these are also associated with experience and related factors backgrounds of the farmer.

Social capital

Social capital factors like being members of development group and frequency of extension visit affect participation in off-farm activities. For FHHs, being members of a development group, has negative and significant influence on off-farm livelihood engagement (p=1%). This might be due to the narrow focus of group members on agriculture per se as rural development mix rather diversifying on multiple options for risk aversion

Frequency of visit by extension agents also has positive and significant influence on MHH and the entire sample size for off-farm engagement (p=1%) and at less than 5% for the entire group.

Gender based determinants of non-farm livelihood choices

The participation of male head households, women head households and the entire sample respondents in non-farm livelihood diversification is analyzed econometrically in Table 4 as a function of human, physical and social capitals. The three non-farm activities are petty trade, hand craft and remittances. As households are rarely

specialized in only one non-farm activity, we use binary logistic model where no participation in non-farm work is the choice comparison.

Human capital factors

These factors affect non-farm participation decision. Among others, gender of the household head, schooling and farming experience all play a role in explaining participation in non-farm participation across the entire sample households. Overall being male headship (p= 5%) and advancement in year of schooling (p=1%) has positive and significant influence on non-farm activities engagement. For MHHs, schooling per se (p=1%) has positive and significant influence on non-farm activities engagement (p=1), while for female headed households, experience in farming negatively affect participation in non-farm livelihood activities (p=1%).

   Keeping the influence of other factors constant, the likelihood of FHHs choice of non-farm livelihood strategy decreases by 4 factors and the opposite is true for the MHH counterparts. This could be perhaps due to the availability of better income in MHH to invest in non-farm like hand crafts and petty trades than for female headed households.

Experience in farming

Experienced HHs tend to engage in non-farm than younger ones. Perhaps this could be due to the shorter planning horizon of old aged people in securing the necessary goods than on long lasting farming activities.

Family size

The odds of participating in off-farm activities increased by 2.5 factors for the two; this could be perhaps due to the availability of extra labours with the limited carry capacity of the available land enforcement in search of alternative livelihood option to ensure their daily necessities.

Physical capital factors

These factors also have a role in non-farm activities engagements. Overall, the location where the respondent is residing has positive and significant influence on non-farm livelihood activities participation. The result shows that households residing in Debrekidan are active participants in non-farm activities than households of Begasheka. Wealth status negatively influence non-farm activities engagement (p=10). For FHHs, wealth status has negative and significant influence on non-farm activities participation (5%).

Land size

An increase land size by one unit is found to hinder participation by 43% for the aggregate community, which

is perhaps due to the availability of enough consumable items from farming for those with better holding size than their counter parts.

Wealth of the household (wealth)

It is found to influence farm and non-farm participation in the FHH function negatively and significantly (P=<1%); perhaps this could be due to the weak attention of households with better off ability in complimenting off-farm with farming activities or in livelihood diversification.

Social capital and network factors

Factors like improved technology adoption (seed and fertilizer), membership in development group and farmer organization have positive and significant influence on non-farm livelihood activities participation. For the entire sample, improved seed and fertilizer adoption and membership in development group negatively affect participation in non-farm livelihood activities, while being member of farmers' organization has positive and significant influence on non-farm engagement. For MHHs, membership in farmers organization (p=1%) has positive and significant influence on non-farm activities engagement (p=1%). For FHHs, membership in development group has negative influence on non-farm activities participation (p=1%).

CONCLUSION AND RECOMMENDATIONS

The issues of livelihood strategy with respect to gender arise from the need to understand and design research results that equally benefits for both women and men of a given community that enhance development prospects of a given nation. Despite this fact, data disaggregated by gender are still poorly developed in our community. Such knowledge which is missing so far also helps to design research works in such a way that male and female headed HHs benefited equally. Hence, this project was proposed to address such knowledge and development gaps. This was aimed at analyzing access to and control over assets between men and women headed household and intra MHHs, identifying the major livelihood strategies of women and men HHs, as well as their underlying determinants and examine the agricultural productivity differentials of both male and female farmers of the two watersheds.

Three groups of livelihood strategies with eight sub-livelihood strategies or activities were identified in the study areas including farming, off-farm and non-farm. In general, bio physical or agro climatic condition is also found to influence households' livelihood diversification strategies. The intensity of participation in some of the activities fluctuates in accordance with the households' sex and income status. Farmers have a number of livelihood diversification strategies available to them and choices of which livelihood to adopt depends on human, social and physical factors.

The intensity of off-farm participation is higher in B/sheka than D/kidane watershed. In terms of gender, female participation is high in D/kidane than B/sheka. In general, 80.8% of the sampled population participates in off-farm activities in which female participation exceeds by 5% than their male counterparts. Off-farm accounts for 26.5% of the total annual income with slightly higher share in D/kidan. The share was mixed in both watersheds in terms of sex of the household head in which D/kidan MHH has numerical higher share than FHH in B/sheka.

The levels of non-farm engagements vary with location and sex of the household head. In general, 26.7% of the respondents were non-farm employed. The shares of non-farm engagements also vary with location and sex of the household head. In this regard, 40% of the FHH annual income and 5% of the MHH annual incomes were obtained from non-farm activities. Gender affects diversification options, including the choice of income-generating activities due to culturally defined roles, social mobility limitations and differential ownership of and/or access to assets.

Based on the present study, it is possible to conclude that the constraints of the rural households in choosing livelihood strategies that will lead them to achieve food security goal should not be put aside since food security problem cannot be overcome by simply concentrating on the farm sector alone; inter-sectoral issues and farm and non-farm linkages need to be addressed as well. Moreover, the contribution made by off-farm and non-agricultural sector to rural households is significant; although for the poor, these activities are survival oriented.

Generally, extension service delivery is found to influence the choice of off-farm and non-farm livelihood strategy negatively. This might be due to the narrow focus of the extension system on agriculture per se as rural development is mixed rather than diversifying on multiple options for risk aversion.

While there is heterogeneity with regards to factors influencing the choice of livelihoods, our results underscore the importance of both gender and household characteristics on livelihood adoption decisions. Our findings imply that public policy can play a role in affecting adoption of livelihood diversification strategies. In particular, we find that asset limits adoption which implies that policies aimed at alleviating poverty will impact adoption decisions of livelihoods positively. In addition the significant and positive impact of access to information indicates that public policies aimed at improving access to information as well as the quality of these sources will help promote livelihood diversification strategies.

Furthermore, we find evidence that such public policies should acknowledge the fact that there could not only be gender differences in livelihood choices, but age of the household head, by affecting aversion to risk and/or life cycle dynamics, will have a differential impact depending on the type of livelihood. In the same light, availability of household labor conditions the choice of livelihood adopted, given that the labor requirements differ from livelihood to livelihood. Thus public policy should be a factor in the impact of these socioeconomic characteristics.

In addition, the significance of gender issue indicates the decision to livelihood choices and as such public policy should be informed by analyses of how different livelihood choices are conditioned by gender issue. Thus the next interesting research question would be to analyze how gender issues affect the amount of income generation implications of different livelihood choices practices.

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Appendix Table 1. Income portfolio analysis of the respondents livelihood strategies (N = 182, Female = 90, Male = 92).

Livelihood strategies	Gender	Wealth categories									
		D/Kidan				F	Begasheka				F
		Poorest	Poor	Less poor	Better off		Poorest	Poor	Less poor	Better off	
Agriculture	M	0.54	0.65	0.74	0.84	2.7 (0.059)	0.34	0.55	0.74	0.69	2.9 (0.045)
	F	0.59	0.60	0.77	0.76	1.53 (0.223)	0.61	0.66	0.63	0.72	0.20 (0.893)
Crop	M	0.45	0.54	0.59	0.48	0.45 (781)	0.33	0.41	0.55	0.40	1.3 (0.287)
	F	0.49	0.50	0.51	0.46	0.03 (0.992)	0.58	0.45	0.40	0.64	1.24 (0.307)
Livestock	M	0.09	0.19	0.15	0.36	2.67 (0.061)	0.00	0.13	0.18	0.28	2.42 (0.078)
	F	0.09	0.10	0.26	0.30	3.22 (0.033)	0.03	0.21	0.23	0.08	2.34 (0.086)
Off-farm	M	0.42	0.36	0.21	0.09	3.11 (0.037)	0.56	0.45	0.24	0.18	4.31 (0.009)
	F	0.30	0.37	0.14	0.07	3.37 (0.028)	0.18	0.22	0.27	0.17	0.87 (0.466)
Safety net	M	0.32	0.29	0.15	0.03	3.75 (0.018)	0.13	0.12	0.10	0.00	4.18 (0.011)
	F	0.30	0.37	0.05	0.07	6.15 (0.002)	0.170	0.15	0.19	0.17	0.23 (0.806)
Wage	M	0.10	0.06	0.06	0.7	0.09 (0.962)	0.43	0.31	0.12	0.17	2.57 (0.066)
	F	0.00	0.00	0.08	0.00	1.75 (0.172)	0.00	0.05	0.06	0.00	0.82 (0.491)
Gathering	M	0.00	0.00	0.04	0.00	0.44 (0.722)	0.00	0.01	0.01	0.00	0.42 (0.741)
	F	0.001	0.00	0.00	0.001	1.08 (0.368)	0.00	0.01	0.02	0.00	0.47 (0.705)
Non-farm	M	0.05	0.04	0.05	0.06	0.03 (0.990)	0.10	0.01	0.01	0.13	2.39 (0.080)
	F	0.11	0.03	0.08	0.16	1.96 (0.137)	0.20	0.11	0.08	0.10	0.59 (0.627)
Petty trade	M	0.00	0.04	0.05	0.06	0.2 (0.890)	0.00	0.01	0.00	0.00	1.16 (0.334)
	F	0.05	0.01	0.06	0.15	1.26 (0.299)	0.00	0.00	0.00	0.10	14.39 (0.000)
Remittance	M	0.00	0.00	0.00	0.01	1.51 (0.227)	0.10	0.00	0.01	0.13	2.53 (0.069)
	F	0.01	0.00	0.01	0.00	0.86 (0.469)	0.17	0.09	0.07	0.00	0.66 (0.580)
Hand craft	M	0.05	0.00	0.00	0.00	3.93 (0.015)	0.00	0.00	0.00	0.00	
	F	0.01	0.00	0.01	0.00	1.23 (0.313)	0.02	0.02	0.01	0.00	0.11 (0.954)