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*RESEARCH ARTICLE*

# GENDER-BASED ANALYSIS OF INCOME DIVERSIFICATION AS A STRATEGY FOR POVERTY REDUCTION IN CENTRAL BENIN (WEST AFRICA).

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## *Abstract*

The fight against poverty is a permanent real challenge that rural people in central-Benin must face by developing survival strategies among which income diversification is one of the most important. Accordingly this paper attempts to analyse this strategy on a gender basis. Based on a random sample of 120 farmers (60 men and 60 women) and using diverse methods and analysis tools including farm-income statement and regression analysis, our study showed that women were more dependent on income diversification from which they, however, drew lower income than their male counterparts due to unequal access to land, on one hand, and to high return off-farm activities, on the other hand. Whereas men could diversify into higher-return activities, women were content with activities with lower-income potential because of their little requirement of initial investment. Compared to women who were specialized in farm production or only in off-farm activities because they were landless, women with diversified income achieved, in average, greater total annual income. Similar results exist between men with diversified income and those specialized only in farm production, suggesting that income diversification positively impacts famers' income, and could therefore contribute to improving their welfare. Factors that significantly and positively influenced the level of off-farm income earned through diversifying income included, for women: the cultivated area, the age and the contact with the extension service; and for men only the cultivated area. Better access to credit and special training in resources management could help poor-farmers and women taking more advantage from income diversification.

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## Introduction:-

Poverty reduction is one of the greatest challenges to which populations in many countries are commonly confronted, because of the difficulty for them to dispose throughout the year of sufficient resources to meet their basic needs. Although poverty is a phenomenon that exists in every region of a country it is, however, most prevalent in rural areas. From a gender perspective rural women appeared more concerned by poverty than men (Reddy and Moletsane, 2009). While factors such as low productivity in the main economic activities such as agriculture, failures in inputs and outputs markets, and lack of credit market are viewed as the major causes of

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poverty, the unequal access to main resources, products and work markets, often imposed by social and economic contexts, are generally considered as the drivers of poverty difference between women and men (cf. Kabeer and Tran Thi Van Anh, 2000; Dolan, 2002; Angelesand Hill, 2009). This situation is of particular concern in most African countries, where women, despite their essential contribution to the rural economic as farmers, labourers and entrepreneurs (FAO, 2011), remains poorer than their male counterparts. Contributing for about 43 % to the farm labour, women in these countries do not, however, represent more than 10 – 20 % of the landowners and do not benefit more than 7 % of the investments allocated to the agricultural sector (FAO, 2011; AFC, 2015). Alike in these countries, poverty in Benin is unequally widespread and concerns mainly the rural populations and particularly women (PNUD, 2010; PAM, 2014). Indeed, agriculture is the main source of income and employment for more than 60 % of the population in Benin. Of family farming type, the agriculture is rainfed, dominated by small scale holdings with low farm productivity caused by decrease in soil fertility and perverse effects of a climate change that have become more and more perceptible in the last years (cf. Yabi, 2013; Yegbemey, 2014). This considerably affects the income of most farm households, thereby rendering them more vulnerable to poverty. Although some few development projects have been initiated by the government in the framework of the achievement of millennium development goals, their effects in rural areas remain, however, very less perceptible and farm households continue to struggle for their survival by developing endogenous strategies. Among these strategies income diversification is one of the most widespread (Gnanglè, 2012; Yegbemey, 2014). Quite all farm households are concerned by the diversification of their income sources, either by exploiting off-farm income opportunities through reinvestments, carrying out off-farm activities to compensate insufficient farm income or substituting this farm income when access to land becomes very difficult (cf. Ellis, 1998). Women and land-poor farmers are particularly dependent on income diversification because of the precariousness of their income from farm production. Despite its socioeconomic importance, income diversification in rural areas of Benin has until now drawn very little attention in the literature. Available recent studies (Gnanglè, 2012; Nouatin, 2014; Yegbemey, 2014) did not do more than reporting income diversification as a widespread adaptive strategy in the context of climate change, while deeper insights into the structure, the composition and the economic importance of this practice are still lacking. How women and men as different actors with different resource endowments exploit the potential of income diversification in rural areas in Benin and how this strategy impacts their living standard remain also unclear. By attempting to analyse the income diversification in the central part of Benin on a gender basis, the present study aims at filling this gap. By doing so, the study could contribute not only to enlarging the knowledge on income diversification in the literature but would also provide a useful database for researchers, development organisations and policy makers interested in the questions of welfare improvement of rural populations.

## Theoretical background:-

From the multiple definitions available in the economic literature and relative to the concept of "Income diversification" (cf. Reardon, 1997; Ellis, 2000a; Barett et al., 2001; Niehof, 2004; Meert et al., 2005; Olaleand Henson, 2013, Meraner et al., 2015), one can deduce that income diversification refers to income strategies of rural individuals or households by which they increase the number of their activities regardless of the sector and the localisation (AloboLoison,2015). Income diversification is, therefore, synonym to pluriactivity (Gondard-Delecroix, 2009) or additional employments (Phélinas, 2004). As a worldwide practice, income diversification occurs in developing as well as in developed countries (Maxwell, 1995; de Haan, 1997; Moser, 1998; Ellis, 1998); it is, however, more widespread in rural areas of developing countries. The common approach used to analyse income diversification in the economic literature is based on the household economic model (Singh et al., 1986; Ellis, 1993). This assumes that household is a production unit that maximizes its utility by combining labour and other inputs to produce output, when subject to prices and resource constraints (Ellis, 2000b). Diversification is then viewed as a function of the remuneration of the labour from farm activities compared to off-farm activities (Singh et al., 1986). Giving a set of resources, the farm household makes its choices by considering the return that could result from off-farm activities (Yaro, 2006). Increases in off-farm incomes accordingly provide incentives for farm households to diversify their activities. Although this approach is useful to understand some decision choices of farmers, it however simplifies the reality. Indeed, the maximisation of profit as a means for achieving the greatest utility is not what only can govern the behaviour of farmers (Debertin, 2012); often, they pursue other goals and objectives that might consist in reducing the risk of falling deeper into poverty. Therefore, farmers would devote to low-return activities, sometimes less profitable than farm activity, just to assure a minimum living standard. As Chambers (1989) argued, maximising incomes may be less of a priority among the poor than decreasing the vulnerability and enhancing the security of their livelihoods. Following Ellis (1993), this approach fails to capture survival strategies of livelihoods under stress. Moreover, it ignores social relationships between members of a household, which in many cases have strong influence on household choices. Division of responsibilities and tasks between men and

women in the household, for instance, affects their production decision and income distribution (Ellis, 1993). Accordingly, this approach may be used with precaution when analysing income diversification in rural areas. Generally farmers and particularly women, land poor and landless farmers are subjected to constraints known as "push factors" that drive them to undertake off-farm activities, mostly low-returned, and therefore defining a form of diversification called "survival-based diversification" (Ellis, 1998; Barrett et al., 2001; Reardon et al., 2007; Lay et al., 2008), whose major aim is to manage risks and to compensate their low resources endowment. Considered as negative factors, "push factors" tend to prevail in agricultural areas with low potential and subjected to drought, flood and to environment degradation (Haggblade et al., 2007). While some of these factors are often connected to different forms of risks such as seasonality and climatic uncertainties, others are related to land pressure, lack or insufficiency of market factors, and to problems of market access (Ellis, 2000b; Barrett et al., 2001). Social factors such as gender specific constraints or social inequalities, lack of formal education, restriction of work market opportunities, and limited access to main resources for women (Oya, 2007; AloboLoison, 2015) are also considered as push factors. In contrast the positive factors, also called "pull factors" are attraction or incentive factors that prompt farm households to carry out income diversification for improving their living standard (AloboLoison, 2015). These factors, such as emergency of opportunities of high return off-farm works market tend to prevail in less-risky and dynamic farm regions (Haggblade et al., 2007), and lead to the form of diversification called "opportunities-based diversification", commonly viewed as a deliberated strategy for households to generate goods for accumulation and reinvestment (Ellis,2000b). Through this diversification, land-rich farmers, wealthy households get involved in high-return off-farm activities, favourable work markets or take advantage of opportunities supplied by technological progress, possibilities of new markets or the proximity of urban centers or improved infrastructures (Lay et al., 2008; Losch et al., 2012). Regardless of the type of factors, there is evidence that income diversification has some impacts in rural areas. For instance in Africa, many studies reported a positive relation between non-farm income, consumption, nutrition and some welfare indicators of households (Ellis, 1998; Barrett et al., 2001; Ellis, 2005). Other findings in Burkina Faso and in Senegal revealed that income diversification has a positive impact on the farm productivity and food security. Accordingly, farm households that lack non-farm incomes become more vulnerable and their food security is more threatened by the seasonal changes (AloboLoison, 2015). Although the impacts of income diversification on the income growth by farm households are clearly highlighted, its effect on the income distribution in rural areas remain mitigated: in some cases income diversification reduce the inequality whereas in other ones it tends to increase this inequality (Reardon, 1997; Barrett et al., 2001; Haggblade et al., 2005), especially where gender specific, gender-intensified and gender-imposed constraints (cf. Kabeer and Tran Thi Van Anh, 2000) prevail and high-return nonfarm activities are unequally distributed in favour of relatively richer and powerful individuals (cf. Canagarajah et al., 2001). This suggests that increasing in equal access to high-return nonfarm activities for poor farmers could help improving outcomes and incomes of disadvantaged populations thereby reducing income inequality in rural areas.

In the light of this theoretical knowledge, the present study has attempted to analyse the economic importance of income diversification on a gender-basis in the central part of Benin. Because different individuals, namely women and men are likely to have different potential of access to different income sources, we assumed that the impacts of those income sources on their livings standard would also differ between men and women.

## Material and methods:-

**Income diversification impact analysis:-**

As socially-defined roles of men and women, gender is often viewed as a constraint that alters the pattern of income diversification pursued by individuals or household (Ellis, 1998). Because of these constraints, women's ability to participate in income earning opportunities outside the household or farm is, in most cases, likely more circumscribed than it is for men. Accordingly, earnings from activities carried out by women and men may differ. To highlight this difference, we first classified the activities undertaken by women into several groups and, by means of the "income statement approach", we estimated the income from each activity, and subsequently the mean income realized by women per group of activities. Likewise, we estimated the mean of income resulting from the activities carried out by men. Differences between women and men were evaluated by using the Student T-test of means comparison.

Based on the aforementioned utility maximisation approach, the income diversification impact has been evaluated. According to this approach a farmer will diversify its income if the expected utility of diversifying income is higher than the expected utility of specializing in a particular activity. However, as the utility is unobservable, one can be

interested in the impact of income diversification on total income insteadof utility. Following Olale and Henson (2013), the impact of income diversification on a farmer's income can therefore be specified as follows:

$$NR_i = R_{i1} - R_{i0} \quad (1)$$

Where $NR_i$is the net income of the farmer *i* as a result of diversifying income into nonfarm work; $R_{i1}$is the total income if the farmer *i* diversifies into nonfarm activities; and $R_{i0}$ is the total income if the farmer *i* specializes in farm work.

In this way the impact of income diversification from each category of actors (women and men) has been evaluated and comparison made by using the Student T-test of means comparison.

**Determinants of the farmer's off-farm income:-**

By assuming that the income level of a farmer is function of some factors related to the farm such as the farm size and some socioeconomic factors of the farmer, namely the age, sex, education level, and access to land, it can, therefore, be mathematically expressed as:

$$\bar{Y} = E\left(Y\middle|X_1,..,X_p\right) = \beta_0 + \beta_1 X_1 + \cdots + \beta_p X_p = \beta_0 + \sum_{k=1}^{m} \beta_k X_{ki} + \sum_{k=(m+1)}^{l=p} \beta_k X_{ki} + \mu_i \quad (2)$$

Where, $\bar{Y}$ is the average total income; K=1, 2,..m, m+1,…p et $X_{1i}$, $X_{2i}$,…,$X_{mi}$ are the quantitative variables; $X_{(m+1)i}$, $X_{(m+2)i}$,….$X_{pi}$ are the qualitative variables related to the farmers; $\beta_k$, are the parameters to be estimated; and $\mu_i$ are the error terms.

Applying the natural logarithm function to the quantitative variables of equation 3, it comes:

$$\ln(\bar{Y}_i) = \beta_0 + [\sum_{k=1}^{n} \beta_k \ln(X_{ki})] + [\sum_{k=(n+1)}^{l} \beta_k X_{ki}\ ] + u_i \quad (3)$$

With ln ($\bar{Y}_i$) the logarithm of the average income of the i$^{th}$ farmer; $\beta_k$ the factor-elasticity of the average income for quantitative variables, when k varies from 1 to n. From the explanatory variables described in table 1 and whose choice was based on Demeke (2003)and Gujarati (2004), and personal observations in the study area, the complete equation of the empirical model can be expressed as:

$$ln(\bar{Y}_i) = \beta_0 + \beta_1 \ln(Farmsize_i) + \beta_2 \ln(Activmembers_i) + \beta_3 ln(Age_i) + \beta_4 (Educationlev_i) + \beta_5 (Farmorganization_i) + \beta_6 (Landaccess_i) + \beta_7 (ContactT_i) + \mu_i \quad (4)$$

Where $\bar{Y}_i$ stands for the average income of the i$^{th}$ farmer; $Farmsize_i$ is the cultivated area in ha; $Activmembers_i$ is the number of the active household members; $Age_i$ is the age of the i$^{th}$ farmer; $Educationlev_i$ stands for educational level; $Farmorganization_i$ is the membership of farmer's organization; $Landaccess_i$ stands for the mode of access of the i$^{th}$ farmer to land; and $ContactT_i$ represents the contact of the i$^{th}$ farmer with the agricultural extension service. The $\mu_i$ indicates the error terms, assumed to be normally distributed N (0, ϭ); and βare estimates to be determined. The estimates $\beta_1$ to $\beta_3$ give directly the Elasticity-factor of the average income for quantitative variables, and $\beta_4$ to $\beta_7$ allow knowing the change in percentage of the income when an explanatory dummy variable varies from one modality to another. According to Gujarati (2004), this change corresponds to ($e^{\alpha i}$ – 1)*100. Therefore, for an explanatory dummy variable X, the model equation is $\ln Y_i = \alpha_0 + \alpha_1 X_i$. When X varies from 0 to 1, $Y_i$ varies from 1 to $e^{\alpha i}$, and the variation change in percentage of $Y_i$ is given by ($e^{\alpha i}$ – 1) *100.

**Table 1:-**Variables introduced in the two models.

| Models | Variables | Modalities | Hypotheses | Expected signs | Related literature to the hypotheses |
|---|---|---|---|---|---|
| 1 and 2 | Age | Quantitative | Younger farmers diversify more their activities and generated more income | + | Meraner et al. (2015) |
| 1 and 2 | Educational level | Qualitative<br>1 if farmer is educated<br>0 if not | Educated farmers diversify more their activities and generate a relative high income level. | + | Cinner et al. (2010) |
| 1 and 2 | Active members | Quantitative | More the size of the household in terms of active members, more the farmers devote themselves to the diversification and more is the generated income. | + | Nilsson (2002)<br>Hassink et al. (2007)<br>Meraner et al. (2015) |
| 1 and 2 | Farm size | Quantitative | More the size of the farm i.e. the cultivated area, less the farmers diversify, generating however a relative high income level. | -/+ | Mishra et al. 2004<br>Meraner et al. (2015) |
| 1 and 2 | Membership of a farm organization | Qualitative<br>1 if farmer is member of a farm organization<br>0 if not | The membership of a farmer organization favours the diversification and the realisation of a relatively high income level. | + | Olaleand Henson (2013) |
| 1 and 2 | Access to land | Qualitative<br>1 if farmer has difficulty in accessing through inheritance to land<br>0 if not | Farmers with strong difficulties for accessing to land through inheritance diversify more. They generate, however, a relatively low income level. | +/- | Degla (2001) |
| 1 and 2 | Contact with the agricultural extension service | Qualitative<br>1 if farmer is regular in touch with the extension service<br>0 if not | More regular the contact with the extension service, more the farmers are successful in their off-farm activities | + | Degla (2014) |

**Study area and database:-**

The study was conducted in two municipalities in central Benin, namely Zakpota and Zogbodomey (cf. Figure 1), that were selected because of their importance in farm production. With 70% and 55% of the households living under the poverty line in Zakpota and Zogbodomey, respectively, the two municipalities count among the poor municipalities of Benin, and especially among those of the central part of Benin (PAM, 2014). Agricultural production is the major economic activity in the region. However, there are many constraints that increasingly limit the potential of the agriculture to remain the first source of income and employment for most farmers. Besides soil fertility degradation and perverse effects of climate change leading to very low farm productivity, social constraints, namely gender specific constraints, are other major factors that considerably affect the agricultural production. Those constraints are either direct due, for example, to the total or partial prohibition for women to inherit land; or indirect, resulting, for example, from land fragmentation through succession and inheritance practices. Acute land pressure in the region (about 434-738 inhabitants/km² in 2013, higher than the national average of 87.2 inhabitants/km²), and traditional inheritance practices have not just accelerated the reduction of farm size (average size in 2013 for more than 61% was less than 1.99 ha) for people that have access to land, but also favoured the

emergence of landless farmers. Ensuring their daily needs through farming was becoming increasingly difficult, and \most farmers, especially women, turned towards off-farm activities to ensure their survival (PAM, 2014).

In each municipality, two villages were chosen based on their importance in farm production and in off-farm activities, and also on their accessibility. Thus, 30 farmers (i.e. 15 women and 15 men), were randomly selected per village from a list of farmers provided by the local agricultural extension service. The total sample size was therefore 120 farmers, the rate of 60 women and 60 men.

To achieve the study's objectives, both primary and secondary data were used. The primary data were collected through individually structured survey (i.e on the sampled producers) and focus group discussions. Additionally, some participatory observations were used to cross-check the collected information and to correct for evident errors that might occur during the interviews. The secondary data were collected from different documentation sources. The data were analysed by using Stata 11.0.

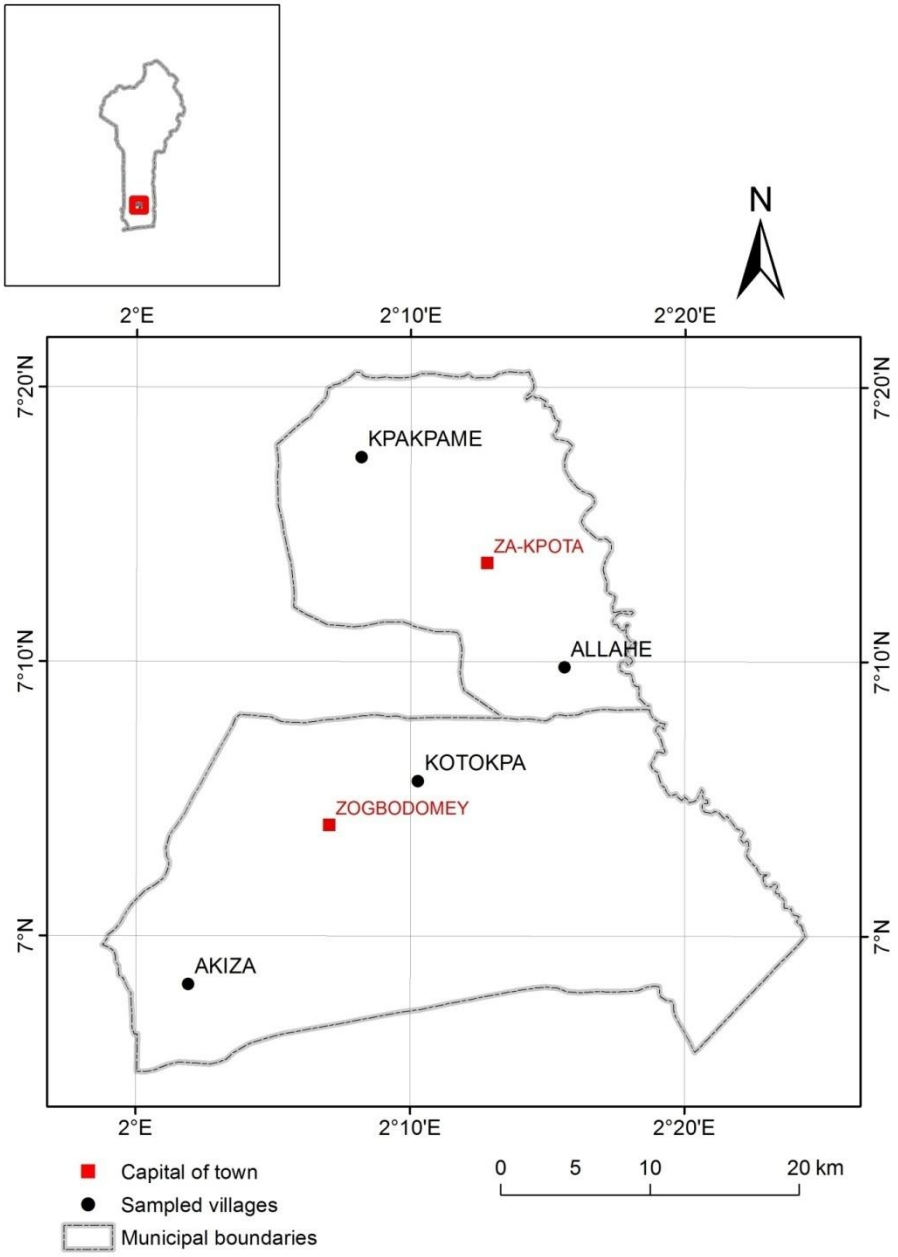


**Figure 1:-**Localisation of the study area

## Results:-

**Demographic and socioeconomic characteristics of the farmers:-**

The main variables describing the selected farmers are summarized in Table 2 and Table 3. The majority of women (92 %) and men (98%) selected were married. Whereas 40 % of men received a formal education, only 28% of women were considered as educated. Membership of a farmer organisation as well as contact with agricultural extension service were more regular for men than for women (cf. Table 2).

**Table 2:-**Qualitative socioeconomic characteristics of the selected farmers.

| Qualitative Variables | Women | | Men | |
|---|---|---|---|---|
| | AbsoluteFrequency | Relative Frequency | AbsoluteFrequency | Relative Frequency |
| Married | 55 | 92 | 59 | 98 |
| Formaleducation | 17 | 28 | 24 | 40 |
| Contact with the extension service | 26 | 43 | 47 | 78 |
| Farmers organisation membership | 28 | 46 | 31 | 51 |
| Inheritance | 6 | 10 | 32 | 53 |
| Land purchasing | 2 | 3 | 20 | 33 |
| landless | 27 | 45 | 0 | 0 |

Although the most significant gender-based constraint in rural areas of Benin remains the land access, in which women were traditionally not entitled to own land through inheritance, one can assist today to some variants of land access, allowing women in some families to inherit land property. Land purchasing is also one of the ways for women with financial possibilities to become landowner. Among the selected farmers, land owned by inheritance and purchasing concerned respectively 10 % and 3 % of women compared to 53 % and 33 % of men. In the bulk of cases women inside their households, exploit land put at their disposal by their husband or other male kin. Land shortage, resulting from high population growth and customary practices, hinders, however nowadays, most men to reallocate land to their wife, making them increasingly landless. Consequently, 45 % of the selected women were without any land to use for farming (cf. Table 2).

From Table 3, it results that there was a large variation in the different quantitative variables within and across the categories of farmers. The selected women were relatively younger (37 ± 11.41 year-old), work with little active household members than men. Women who have access to land had in average 1.50 ± 2.35 ha of land, which was far lesser than the land owned by their male counterparts and that averaged 7.93 ± 6.45 ha.

**Table 3:-**Quantitative demographic and socioeconomic characteristics of the producers

| | | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Women | Age | 37 | 11.41 | 20 | 60 |
| | Active Members | 3 | 1.30 | 1 | 5 |
| | Available Cultivated area in ha | 1.50 | 2.35 | - | 10.50 |
| Men | Age | 39 | 9.82 | 18 | 70 |
| | Active Members | 6 | 3.45 | 1 | 13 |
| | Available cultivable area in ha | 7.93 | 6.45 | 1.50 | 31.50 |

This asymmetry in access to and control over land is, in the study area, one of the major factors that determined the nature of livelihood activities that farmers were likely to undertake. Therefore, some farmers with very large farm size concentrated their activity only on farm production. In our sample 13 % of women and 20 % of men were concerned (cf. Table 4). Other farmers diversified their activities by associating farming with off-farm activities. More male farmers (80 %) were involved in the diversification compared to their female counterparts (45 %), likely because men were already more numerous in farming activities. The last category of farmers made of landless

farmers, was represented only by women who were accordingly forced to ensure theirneeds from off-farm activities (Table 4).

**Table 4:-**Distribution of farmers according to the type of activities.

| Categories of activities | Women | | Men | |
|---|---|---|---|---|
| | AbsoluteFrequency | Relative Frequency | AbsoluteFrequency | Relative Frequency |
| Farmactivity | 8 | 13 | 12 | 20 |
| Off –farm activity | 25 | 41 | 0 | 0 |
| Farm and Off-farm activities | 27 | 45 | 48 | 80 |

**Components of income diversification activities in the study area:-**

Income diversification, as already mentioned, implies that farmers carry out one or many off-farms activities, in addition to the farm production. These non-farm activities are in the bulk of cases gender-based, capital or labour intense, require for most of them little capital or skill; and many of these activities are low-return, especially those in which women are involved (cf. Table 5).

**Table 5:-**Main off-farm activities carried-out by the selected farmers.

| Activities | Actors | Description | Characteristics | Income potential |
|---|---|---|---|---|
| **Petty-Trade** | More for Women | Trade of farm and/or imported products | Little or high requirement for capital | Low or High-return |
| **Traditional cottage industries** | More for Men | Production of local schnapps from palm wine (Sodabi) | high requirement for capital | High-return |
| | Only Women | Processing of manioc in manioc powder | Little requirement for capital | Low-return |
| | Only Women | Processing of palm nuts in palm oil | Little requirement for capital | Low-return |
| | Only Women | Processing of bean or soya in fritter | Little requirement for capital | Low-return |
| **Rearing** | Women and Men | Extensive rearing of small domestic animals | Little requirement for skill and capital | Low-return |
| **Selling of Workforce** | Only for Men | Labor intensive works outside of the farm | Little requirement for skill | Low-return |
| **Handicrafts** | Women and Men | Unskilled local plaits and baskets factories, burning charcoal | Little requirement for skill and capital | Low-return |
| **Transport activities** | Only for Men | Taxi-Moto | High requirement for skill and capital | High-return |

From a gender view, one could notice that most processing activities, except the distillation of palm wine, were carried out quite exclusively by women, due probably to their experience with domestic cooking tasks for which they were responsible in their own households. Their participation to the distillation of palm wine was more contingent upon their access to capital. Petty-trade was more widespread in women than in men, the latter were met more often in whole trading with high start capital requirement and high-return potential. The selling of workforce was very gender specific. While both men and women could engage themselves in farming activities outside their family farm, women were often hired for labour-intensive tasks of planting, weeding, and harvesting. Men predominated in tasks that require significant physical strength such as land clearing, ploughing. Handicrafts activities as well as the rearing of small animals were carried out by both men and women, while driving Taxi-Moto, an activity with high requirement for skill and capital was exclusively left in the hands of men. Although there were some farmers who devoted themselves to only a given off-farm activity, it was common that most of them undertook more than two off-farm activities simultaneously. So was the case for 52 % of women and 54 % of their selected male counterparts.

Amongst the main reasons that drove the selected farmers to undertake income diversification activities were the insufficiency or lack of farm income (85 % of women, 65 % of men) for assuring their living and the search for more profitable activities (15 % women and 25 % men).

**Incomes resulting from the diverse activities:-**

Three categories of incomes earned by all the selected producers are summarized in Table 6. They include: farm income for producers that were specialized in farm production; off-farm income for those who were engaged only in off-farm activities; and then farm and off-farm income for farmers who diversified their activities. A strong incomes variation could be observed within and across the categories. In each of these categories, incomes earned by men were significantly higher than those gained by women.

**Table 6:-**Incomes from all the selected farmers according to the activity and the gender.

| | | **Mean** | **Standard Deviation** | **Minimum** | **Maximum** |
|---|---|---|---|---|---|
| **Men** | Farm income | 589 300 | 557 276 | 57 200 | 3 292 000 |
| | Off farm Income | 270 936 | 366 797 | 0.000 | 1 463 414 |
| | Farm und Off farm income | 763 469 | 799 745 | 0.000 | 4 336 450 |
| **Women** | Farmincome | 93 224 | 183 489 | 0.000 | 1 111 340 |
| | Off farmincome | 142 383 | 233 218 | 0.000 | 1 320 750 |
| | Farm und Off farm income | 293 790 | 380 452 | 0.000 | 1 976 340 |

The same trend of income means difference between women and men were also observed when considering only the farmers who diversified their income (Table 7). Mean incomes from farm and off-farm activities were, respectively almost four times and twice higher for men than for women. While the difference in farm incomes between men and women could be attributed to the asymmetry in access to and control over fertile land, the difference in off-farm income is likely due to the difficult access to high income-returned off-farm activities for women.

**Table 7:-**Distribution on a gender basis of incomes from producers who diversified their activities.

| | | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Men | Farmincome | 615 665 | 584 014 | 57 200 | 3 292 000 |
| | Off-farmincome | 338 671 | 381 396 | 9 000 | 1 463 414 |
| | Farm and Off-farm income | 954 336 | 785 408 | 111 200 | 4 336 450 |
| Women | Farmincome | 175 724 | 235 378 | 4 260 | 1 111 340 |
| | Off-farmincome | 172 471 | 237 224 | 2 600 | 865 000 |
| | Farm and Off-farm income | 348 195 | 391 032 | 14 760 | 1 976 340 |

**Factors influencing off-farm income from farmers who diversified their activities:-**

Off-farm activities can be considered as the most important component of income diversification. Therefore, the knowledge of any factor that influences the level of income from off-farm activities could be of great importance in the analysis and promotion of income diversification strategies. For this purpose, the theoretical model described in section 3.2 was used on a gender basis. Results showed that the estimated models had no problem of autocorrelation and heteroscedasticity, and the likelihood functions of the two models were significant with $p = 0.001$. The adjusted $R^2$ in the models were 0.4721 and 0.4230, respectively (Table 8). These values imply that the sample variations of about 47.21 % of the model used for women, and 42.30 % of the model estimated for men were taken into account by the explanatory variables investigated.

**Table 8:-**Determinants of off farm income from farmers participating to income diversification.

| | **Women** | | | | **Men** | | | |
|---|---|---|---|---|---|---|---|---|
| **Variables** | Coef. | **Std. Err.** | **t** | **P> (t)** | **Coef.** | **Std. Err.** | **t** | **P> (t)** |
| **Cultivated area in ha (LnArea)** | .412506 | .198517 | 2.08 | 0.049** | .839824 | .144307 | 5.82 | 0.000**** |
| **Active number (LnActive)** | .144886 | .341854 | 0.42 | 0.675 | -.088910 | .146677 | -0.61 | 0.547 |
| **Age (LnAge)** | .981082 | .651673 | 1.51 | 0.144* | -.232289 | .336886 | -0.69 | 0.494 |
| **Formal Education** | -.104931 | .350666 | -0.30 | 0.767 | .026981 | .176682 | 0.15 | 0.879 |
| **Membership of F.A.** | .403269 | .397918 | 1.01 | 0.321 | -.027199 | .096147 | -0.28 | 0.778 |
| **inheritance** | .221305 | .362187 | 0.61 | 0.547 | .161927 | .1643074 | 0.99 | 0.329 |
| **Contact with E.S.** | 1.182053 | .446414 | 2.65 | 0.014*** | .063722 | .219899 | 0.29 | 0.773 |
| **Constant** | 6.544258 | 2.532546 | 2.58 | 0.016** | 12.29893 | 1.183474 | 10.39 | 0.000*** |
| **Summary of the models** | Dependent variable : Ln(Total off farm income) | | | | | | | |
| | Number of obs = 32<br>Fischer Probability= 0.0014***<br>$R^2$ Adjusted = 0.4721 | | | | Number of obs = 60<br>Fischer Probability = 0.0000***<br>$R^2$ Adjusted = 0.4230 | | | |
| **Heterosced-asticity tests** | **Breusch-pagan/Coo-Weisberg test**:<br>Prob> chi2 = 0.5922<br>**White's test** : Prob> chi2 = 0.4167 | | | | **Breusch-pagan/Coo-Weisberg test:**<br>Prob> chi2 = 0.6500<br>**White's test**: Prob> chi2 = 0.4559 | | | |
| * : ** ; *** ; = significant at 10%, 5% and 1% respectively | | | | | | | | |

F.A = Farmer association, E.S. Extension service

While the cultivated area by women, their age and their contact with the agricultural extension services significantly influenced the level of their off-farm income, only the cultivated area had a significant effect on the income from the off-farm activities carried out by their male counterparts. As revealed by the adjusted $R^2$ (42%), there are probably many others significant factors related for instance to environment factors and other characteristics of the farmers such as their wealth statement that could not be taken into account in the present study. The cultivated area by women as well by men had a significantly positive effect on the level of the off-farm income, suggesting that an increase of the cultivated area of 1 % would induce, *ceteris paribus*, an increase of the off-farm income of 41 % and 84 %, respectively, for women and men. Although such results could be more comprehensible when analysing the relationship between cultivated area and farm income, it highlighted here rather the dependence between farm income and off-farm income. Indeed, farmers with large area were in an extensive agricultural production system, and were, thereby, those who could realize more farm revenue, susceptible to be reinvested in high income returned off-farm activities. In that respect, an increase of the cultivated area of 1 % could result, *ceteris paribus*, in an increase of the off-farm income of 41 % by women and 84 % by men. As expected, the age of the female producer had a positive influence on the level of their off-farm income, suggesting that the elder the women (what could be related to the experience in managing economic activities), the higher the gains realized from non-farm activities. Such a result was, however, not found for male producers for whom the effect was negative and not significant. Regular contact with agricultural extension services positively influenced the level of off-farm income of the women, thereby confirming that the new training programmes were increasingly oriented towards female farmers. Accordingly, from a female farmer who had any contact with the extension services to another one who had regularly benefited from technical support, an increase of the off-farm income of 226% [$=100*(e^{+1.182}-1)$] could occur.

**Impact of income diversification:-**

As mentioned in section 3.1, the analysis of the impact of income diversification in the study area has been reduced to its effect on income of the farmers. In that respect, results from Table 9 showed that income diversification contributed to 35 % and 50 % of the total annual income, respectively for men and women.

**Table 9:-** Importance of income diversification in terms of revenue .

| | | Means of income in F CFA | Share of income in total income (%) |
|---|---|---|---|
| **Men** | **Farm income** | 615 665 | 65 |
| | **Off-farm Income (income from the diversification)** | 338 671 | 35 |
| | **Farm and Off-farm income** | 954 336 | 100 |
| **Women** | **Farmincome** | 175 724 | 50 |
| | **Off-farm Income (income from the diversification)** | 172 471 | 50 |
| | **Farm and Off-farm income** | 348 195 | 100 |

The importance of income diversification was greater for women than for men. Women depended more on off-farm activities than men due to the asymmetry in their access to and control over land, that hinder most of them to assure their living from farm production. Compared, respectively, to women who were engaged only in farm production (because of the easy access for them to large family land), and to landless women who were forced to undertake only off-farm activities, the average total annual income for women who diversified their income (348 195 ± 391 032 FCFA) was significantly higher than the one for women engaged only in farm production (106 113 ± 143 227 FCFA) and for those who carried out only off-farm activities (155 450 ± 254 541 FCFA). In contrast the average total annual income for men who diversified their income source (954 336 ± 785 408 FCFA) was higher than that from men engaged only in farm production (53 424 ± 62 739 FCFA); the comparison with revenue from men with off farm income only was not possible as there were no landless farmers among the male producers.

## Discussion:-

Many studies (Maxwell, 1995; de Haan, 1997; Moser, 1998; Ellis, 1998; Barrett et al., 2001;Haggblade et al., 2007; AloboLoison, 2015), have reported the importance of income diversification as a worldwide activity driven by many factors classified as “push” and “pull” factors. The main reasons given by the farmers for diversifying their income sources in the study area can be ranged into these two categories of factors. Indeed, the lack or insufficiency of farm income pushes most female as well as male farmers to undertake income diversification activities to assure their needs for survival and consequently, to avoid falling deeper into poverty. In contrast, great income potential from some off-farm activities attracts relatively rich farmers in terms of land endowment to invest in such activities. Many of these high return activities such as the intensive rearing of poultry, the brewing of palm wine, the whole trading and Moto Taxi driving are dominated by men, not because they require special skills and knowledge that women could not acquire but rather due to their high start capital requirements that are, for most women, difficult to afford. So, in the study area there was a clear differential access to and use of advantage accrued from high return activities, and this is in support to the concept of gender intensified constraints and gender intensified disadvantage developed by Kabeer and Tran Thi Van Anh (2000). Because most female respondents were engaged in relatively low income potential activities, their annual income was lower than that of their male counterparts who are better off, thereby suggesting that any improvement in the access of women to high return activities could subsequently improve their financial situation and bring them out of poverty. This result corroborates the findings from the gender based study on livelihoods in Uganda realized by Dolan (2002). Among specific factors that influence the level of off-farm income from women and men carrying out income diversification activities, there are at the level of women the cultivated area, the age and the contact with the extension services; and at the level of male farmers only the cultivated area. The same positive relation between the size of the cultivated area and the level of off-farm income for the two categories of farmers highlights the link between farm and off-farm incomes and could be interpreted as follows: “ the higher the farm income, the greater the opportunity to realize higher off-farm income”. Farmers with sufficient land endowment draw already enough farm income for ensuring their survival and are, subsequently, guided only by the need of reinvesting their farm income surplus into specifically higher return off-farm activities. Land endowment in the study area is accordingly not only a discrimination factor in farm production but also in realizing more profit from off-farm activities. As pointed out by Degla (2014), regular contact of farmers with

agricultural extension services positively impacts the outcome from their activities. These findings could be confirmed in the present study only for female farmers who undertook income diversification activities, and for whom off-farm income is susceptible to increase up to 226% [=100*($e^{+1.182}$-1)], when moving from women without technical support to those who are regularly in touch with the extension services. In Benin, training of farmers in agricultural issues has been for long time oriented quite exclusively towards men as household heads, so that contact with the extension services does not represent for the majority of men any more than an additional factor that discriminates men from women in their respective activities. In recent years however, women increasingly benefited from the extension services through new specific programs such as the "Management Advice for Family Farm" that provide them important tools for improving the financial and economic performances of their activities. In this way, women who benefited from technical support are more susceptible to increase their off-farm income than the other ones. As for the age of the producers, one can suppose that then elder the farmer, the higher his experience in managing economic activities from which more outcomes could also result. This relation between the age of farmers and the outcomes of their activities as highlighted by Meraner et al. (2015), is supported in the present study only through the results from women who diversified their income but did not apply for their male counterparts, probably because since their teenager hood boys (future men) are already and very often engaged in farming activities in beside their parents so that, while still being young farmers they had acquired sufficient experience, like the oldest ones, in managing economic activities. Based on the $R^2$ values of 47.21 % for women and 42.30 % for men, one can assume that there are other remaining factors (e.g. other few characteristics of the farmers and environmental factors) that could not be identified by this study and that could be of interest for future studies. Our results also showed that income diversification contributed to 35 % of the average annual income for men and 50 % for their female counterparts. Therefore, income diversification positively impacted the total annual income of farmers regardless of the gender, which agrees with the findings by Olale and Spencer (2013) from Kenyan fishers with diversified income sources. As income is a key factor that measures the purchase power and the living conditions of people, the positive impact of income diversification on the total income would likely contribute to improving the purchase power and subsequently the living conditions of farmers with diversified income sources in the study area. Thus, our result supports many findings from different authors like Reardon et al. (1992)who stated that in Burkina Faso income diversification is associated with higher income and food consumption as well as more stable income and consumption over time; Block and Webb (2001) who pointed out that income diversification is coupled with higher income and nutrition in Ethiopia; Barret et al (2001) who found in Côte d'Ivoire and Kenya a strong relationship between income diversification and higher wealth and income; and Ellis (1998)who asserted that the extent of non–farm diversification is an indicator of the degree to which farming households can improve their livelihood security and raise their living standards. Beside the positive impact of income diversification, our study also showed concordantly with Ellis (1998), Block and Webb (2001),andAloboLoison (2015), that income diversification can stress the income inequality between male and female farmers as well as within each group of farmers. Indeed, asymmetry in land access between women or between men as well as between women and men, already induces an income inequality that is worsened when some farmers with diversified income sources have access to higher return off-farm activities compared with the others. This is illustrated in Table 6, where average off-farm income resulting from income diversification activities reached 270 936 ± 366 797 FCFA for men and only 142 383 ± 233 218 FCFA for women due to the prevalence of men in accessing off-farm activities with higher income potential. Similar income inequality could also be observed between women with diversified income sources and those specialized in farm production, on the one hand, and between men who undertook income diversification activities and those who devoted themselves only to farming, on the other hand, due to in both cases to the impact of income diversification. All these results suggest that income inequality that emerges especially from the asymmetry in access to land or to high return off-farm activities could be reduced by improving credit access for poor female and male farmers.

## Conclusion:-

Income diversification is a widespread practice in rural areas of central Benin and concerned men as well as women. Asymmetric access to and control over land between men and women make, however, women more dependent on income diversification than their male counterparts for assuring their survival. A large portfolio of off-farm activities ranging from labour intensive and low return activities such as small handicrafts, labour selling up to capital intensive and high return activities such as whole trading and production of local schnapps, are carried out in the framework of income diversification. High start capital requirements for high return off-farm activities drive, however, most women to turn themselves towards labour intensive activities or those with little requirements of initial investment with generally low income, whereas, in contrast, most men succeeds in undertaking high return off-farm activities. In that respect, average annual outcome from off-farm activities carried-out by women (172 471

± 237 224 FCFA) is lower than from those undertaken by men (338 671 ± 381 396 FCFA). Women with diversified income sources yield an average total annual income of 348 195 ± 391 032 FCFA, and are, however, better off than those specialized either in farm production (106 113 ± 143 227 FCFA) or only in off farm activities (155 450 ± 254 541 FCFA). Similar trends were observed between men with diversified income sources and those specialised in farm production, and showed,moreover, that income diversification had a positive impact on the income of former category and could thereby contribute to improving their purchase power and their living standards compared with the latter one. Although favourable to its practitioners the impact of income diversification activities, can, however, worsens the prevailing income inequality between women and men, on the one hand, and within women or within men, on the other hand, due to the asymmetry in the access to land and to high return off-farm activities. Our results also showed that factors that significantly and positively influence the level of income from off-farm activities carried out by the farmers with diversified income include for women cultivated area, age and regular contact with agricultural extension services, while for men the only influencing factor is the cultivated area. Whereas cultivated area highlights the link between farm and off-farm incomes through the reinvestment the surplus of farm income into high return off-farm activities for both women and men, age, in women, shows how their experience linked to their age in carrying out off-farm activities contributed in high outcome. Their contact with agricultural extension services reveals the positive effects of new training programs in favour of women in relation with the management of their economic activities. The relatively low value of the $R^2$ of the regression models for women and men showed, however, that there are many other significant factors that could not be taken into account in the present study, thereby suggesting the necessity of an additional deeper analysis through future studies to broaden our knowledge on the drivers of the outcome from income diversification strategies. The findings from this study allow concluding that income diversification can be considered as an important pathway out of poverty. Rural populations can well improve their welfare through income diversification, when they, in particular the poorest ones (i.e. women) could be assisted through adequate policy measures, including better access to credit by means of microcredit programs, and special training programs in the management of rural economic activities.

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## References:-

1. AFD (2015) : Place des femmes dans l'agriculture dans les pays en développement, Genre et agriculture N° 21. http:://genre/21Genre-et-agriculture/AFD.pdf (July 1, 2016)
2. AloboLoison, S. (2015): Rural Livelihood Diversification in Sub-Saharan Africa: A Literature Review, The Journal of Development Studies, 51:9, 1125-1138.
3. Angeles, L.C. and K. Hill, K. (2009): The gender dimension of the agrarian transition: women, men and livelihood diversification in two peri-urban farming communities in the Philippines, Gender, Place & Culture, 16:5, 609-629. DOI: 10.1080/09663690903148465
4. Barrett, C.B., Reardon, T. and Webb, P. (2001): Nonfarm income diversification and household livelihood strategies in rural Africa: concepts, dynamics, and policy implications. Food Policy 26 (2001) 315–331.
5. Block, S. and Webb, P. (2001): The dynamics of livelihood diversification in post-famine Ethiopia, Food Policy, 26(4), 333–350
6. Canagarajah, S. Newman, C. and Bhattamishra, R. (2001) Non-farm income, gender, and inequality: Evidence from rural Ghana and Uganda, Food Policy, 26(4), 405–420. doi:10.1016/S0306-9192(01)00011-2.
7. Chambers, R. (1983): Rural Development: Putting the Last First, Longman, London.
8. Cinner, J.E., McClanahan, T.R. and Wamukota, A. (2010): Differences in livelihoods, socioeconomic characteristics, and knowledge about the sea between fishers and non-fishers living near and far from marine parks on the Kenyan coast. Marine Policy, 34 (2010) 22–28.
9. Debertin, D.L. (2012): Agricultural Production Economics, 2nd Ed., (pp.413) Macmillan Publishing Company, Upper Saddle River, N.J., USA.
10. Degla, P. (2001): Ewerbs- und Einkommenskombination im ländlichen Raum Südbenins / Westafrika, in Berichte über Landwirtschaft, Zeitschrift für Agrarpolitik und Landwirtschaft, Band 79 (3), pp. 485-493.
11. Degla, K.P. (2014) : Effets du conseil à l'exploitation agricole familiale sur la rentabilité de la production du maïs et du coton au nord-Benin, Annales de l'Université de Parakou, Série « Sociologie & Economie », Vol 1, N°1, déc. 2014
12. De Haan, A. (1997): (ed.), Urban Poverty: A New Research Agenda, IDS Bulletin, Vol.28, No.2.

13. Demeke, A.B. (2003): Factors influencing the adoption of soil conservation practices in Northwestern Ethiopia; Discussion papers, Institute of Rural Development of Göttingen, Germany, No 37, pp. 73.
14. Dolan, C. (2002): Gender and Diverse Livelihoods in Uganda. Ladder Working Paper No. 10. http://www.uea.ac.uk/dev/odg/ladder (October 25, 2015)
15. Ellis, F. (1993): Peasant economics: Farm households in agrarian development. Cambridge: Cambridge University Press.
16. Ellis, F. (1998): Household strategies and rural livelihood diversification, The Journal of Development Studies, 35:1, 1-38.
17. Ellis, F. (2000a): Rural livelihoods and diversity in developing countries. New York, NY: Oxford University Press.
18. Ellis, F. (2000b): The determinants of rural livelihood diversification in developing countries, Journal of Agricultural Economics, 51(2), 289–302.
19. Ellis, F. (2005): Small-farms, livelihood diversification and rural-urban transitions: Strategic issues in Sub-Saharan Africa, Presented at the future of small farms, Withersdane Conference Centre, Wye, Kent, UK
20. FAO (2011): WOMEN IN AGRICULTURE. Closing the gender gap for development.The state of food and agriculture 2010-2011. Rome: FAO.http://genre/Women-in-agriculture.FAO-2010-11.pdf (July 1, 2016)
21. Gnanglè, P.C., Yabi, J.A., Yegbemey, N.R., GlèlèKakaï, L.R. and Sokpon, N. (2012) : Rentabilité économique des systèmes de production des parcs à Karité dans le contexte de l'adaptation au changement climatique du Nord-bénin, AfricanCrop Science Journal, 20(s2), 589–60.
22. Gondard-Delcroix, C. (2009): Risque, Pluriactivité Rurale et Dynamiques de Pauvreté en Milieu Rural Malgache, Journal of HumanDevelopment and Capabilities, 10:1, 77-101.
23. Gujarati, D.N. (2004): Basic Econometrics, 4th ed. The McGraw Hill Companies, New York.
24. Haggblade, S., Hazell, P. and Reardon, T. (2005): The rural nonfarm economy: Pathway out of poverty or pathway in? (pp. 151–178). Presented at the 'The Future of Small-Farms,' Withersdane Conference Centre, Wye, Kent, UK.
25. Haggblade, S., Hazell, P.B.R. and Reardon, T. (2007): Transforming the rural nonfarm economy: Opportunities and threats in the developing world. Washington, DC: International Food Policy Research Institute.
26. Hassink, J., Zwartbol, C., Elings, M. and Thissen, J. (2007): Current status and potential of care farms in the Netherlands, NJAS Wagening. J. Life Sci. 55 (16), 21–36.
27. Kabeer,N. and Tran Thi Van Anh, (2000): Leaving the Ricefields but not the Countryside: Gender Livelihood Diversification and Pro-Poor Growth in Rural Vietnam, Occasional Paper No. 13, Geneva,UNRISD.
28. Lay, J., Mahmoud, T.O. and M'Mukaria, G.M. (2008): Few opportunities, much desperation: The dichotomy of non-agricultural activities and inequality in Western Kenya. World Development 36 (12), 2713–2732.
29. Losch, B., Freguin-Gresh, S. and White, E.T. (2012): Structural transformation and rural change revisited: Challenges for late developing countries in a globalizing world, AgenceFrançaise de Développement and the World Bank: Washington, DC: World Bank Publications.
30. Maxwell, D.G. (1995): Alternative Food Security Strategy: A Household Analysis of Urban Agriculture in Kampala, World Development, Vol.23, No.10, pp.1669-81.
31. Meert, H., Van Huylenbroeckc, G., Vernimmenc, T., Bourgeois, M. and van Hecke, E. (2005): Farm household survival strategies and diversification on marginal farms, Journal of Rural Studies 21 (2005) 81–97.
32. Meraner, M., Heijman, W., Kuhlman, T. and Finger, R. (2015): Determinants of farm diversification in the Netherlands, Land Use Policy 42 (2015) 767–780.
33. Mishra, A.K., El-Osta, H.S. and Sandretto, C.L. (2004): Factors affecting farm enterprise diversification. Agric. Financ. Rev. 64 (2), 151–166
34. Moser, C.O.N. (1998): The Asset Vulnerability Framework: Reassessing Urban Poverty Reduction Strategies, World Development, Vol. 26, No.1, pp.1-19.
35. Niehof, A. (2004): The significance of diversification for rural livelihood systems. Food Policy, 29(4), 321–338.
36. Nilsson, P.Ä. (2002): Staying on farms: an ideological background. Ann. Tour Res, 29(1), 7-24.
37. Nouatin, G., Amouzouvi, H.D. and Dedjan, J. (2014): Climate change and farmers perception of climatic evolution in Alibori Department in Benin, International Journal of Research in Earth & Environmental Sciences, Feb. 2014, Vol. 1, No. 4, pp. 1-9.
38. Olale E. and Henson, S. (2013): The impact of income diversification among fishing communities in Western Kenya, Food Policy 43 (2013) 90–99.

39. Oya, C. (2007): Stories of rural accumulation in Africa: Trajectories and transitions among rural capitalists in Senegal. Journal of Agrarian Change, 7(4), 453–493.
40. PNUD (2010) :Benin progrès vers les OMD, Février 2010, PNUD Bénin.http://www.bj. undp.org/content/benin/fr/home/post-2010/mdgoverview.html (May 5, 2015)
41. PAM(2014) : Analyse globale de la vulnérabilité et de la sécurité alimentaire au Bénin, Rome, Italie.http://www.wfp.org/food-security (June 30, 2015)
42. Phélinas, P. (2004): L'emploi complémentaire en milieu rural péruvien : la richesse des pauvres? Économierurale. N°282, pp. 40-58.
43. Reardon, T., Delgado, C. and Matlon, P. (1992): Determinants and effects of income diversification amongst farm households in Burkina Faso. Journal of Development Studies 28, 264–296
44. Reardon, T. (1997): Using Evidence of Household Income Diversification to Inform Study of the Rural Non-farm Labor Market in Africa, World Development, Vol.25, No.5, pp.735-47.
45. Reardon, T. and Timmer, C.P. (2007): Transformation of markets for agricultural output in developing countries since 1950: How has thinking changed? In I. R. Evenson& P. Pingali (Eds.), Handbook of agricultural economics (Vol. 3, pp. 2807–2855). Amsterdam: Elsevier.
46. Reddy, V. and Moletsane, R. (2015): "Gender and poverty reduction in its African Feminist practice: An introduction", Agenda, 23:81, 3-13.
47. Singh, I., Squire, L. and Strauss, J. (1986): A survey of agricultural household models: Recent findings and policy implications, The World Bank Economic Review, 1(1), 149–179.
48. Yabi, A.J., Tovignan, S.D. and Moustafa, R. (2013): Analysis of maize production and supply for food security improvement in the Borgou region in Northeast of Benin, African Journal of Agricultural Research, Vol. 8(11), pp. 943-951, 28.
49. Yaro, J.A. (2006): Is deagrarianisation real? A study of livelihood activities in rural northern Ghana. The Journal of Modern African Studies, 44(01), 125–156.
50. Yegbemey, N.R., Humayun, K., Oyémonbadé, H.R., Awoye, Yabi, A.J. and Paraïso, A.A. (2014): Managing the agricultural calendar as coping mechanism to climate variability: A case study of maize farming in northern Benin, West Africa, Climate Risk Management, xxx (2014) xxx–xxx.