Agricultural feminization is prevalent among Sub Sahara Africa (SSA) low income countries. Most of the residents in low income countries still live in rural areas and agriculture hires more than half of the labor force. While the share of female employment in agriculture exceeds the share of male employment, lack of land ownership, credit, water and other production inputs often limits women's productivity and leaves them in extreme poverty. Feminization of poverty partially can be explained by agricultural feminization. Although the agricultural sector's share in employment shrinks during urbanization, the relative proportion of women working in agriculture increases (Lastarria, 2008). Croppenstendt et al. suggest that lack of agriculture production inputs, such as, land ownership, fertilizer, and credit, water etc., explains the gender productivity gap. Here, the empowerment of women in agriculture is justified by the practice of irrigation cultivation, access to land, the acquisition of organic fertilizers, chemical fertilizers and seeds. So, in this first part of our study, we are interested in farm households that have these agricultural assets.



Judith Urielle Tossou
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# Assessing the effects of women empowerment

## women employment and entrepreneurship in poverty alleviation in Bénin

Mrs J. Tossou was a reasearch assistant within the project "Youth unemployment and transition from school to work in Benin". She is currently working on an individual research project around the topic "Effect of women landowners on household food security in Benin".

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# *ASSESSING THE EFFECTS OF WOMEN EMPOWERMENT, WOMEN EMPLOYMENT AND ENTREPRENEURSHIP IN POVERTY ALLEVIATION IN BENIN*

***By***

**Judith Urielle TOSSOU**

## *I - INTRODUCTION*

Political actors and researchers recognize that the agricultural sector contributes to food security, poverty reduction and growth in many developing countries (FAO, 2012, World Bank, 2008). For example, Haggblade and Gabre-Madhin (2010) show that in sub-Saharan Africa, agriculture remains the main source of employment with 65% of full-time jobs and 25-30% of Gross Domestic Product (GDP). Numerous studies that have analysed national policies and programmes to address food needs in developing countries highlight the important role of women in agricultural production and food security (Chapoto et al., 2011, FAO, 2012). Depending on the state of food and agriculture (FAO, 2011), reducing the constraints faced by women farmers could increase farm yields by 20-30% and increase total agricultural production in developing countries by 2.5 to 4%, which would have a significant impact on food availability.

Agricultural feminization is prevalent among *Sub Sahara Africa (SSA) low income countries.* Most of the residents in low income countries still live in rural areas and agriculture hires more than half of the labor force. While the share of female employment in agriculture exceeds the share of male employment, lack of land ownership, credit, water and other production inputs often limits women's productivity and leaves them in extreme poverty (Croppenstedt et al., 2013). Feminization of poverty partially can be explained by agricultural feminization. Although the agricultural sector's share in employment shrinks during urbanization, the relative proportion of women working in agriculture increases (Lastarria, 2008). Croppenstendt et al. (2013) suggest that lack of agriculture production inputs, such as, land ownership, fertilizer, and credit, water etc., explains the gender productivity gap. Here, the empowerment of women in agriculture is justified by the practice of irrigation cultivation, access to land, the acquisition of organic fertilizers, chemical fertilizers and seeds. So, in this first part of our study, we are interested in farm households that have these agricultural assets.

On the other hand, women's specific incomes, whatever their nature (donations collected, income from dependent or independent activity) are positively associated with food diversity. Thus, and more generally, Lourme-Ruiz (2017) shows that in this context, and as Malapit et al. (2015) wrote in the case of Nepal, women's "empowerment" mitigates the negative effects of low agricultural diversity on the nutrition of women and children. In addition, if women are offered better quality jobs, development outcomes will be affected, according to the International Finance Corporation (IFC), especially as women spend their income on health, education and children's nutrition. However, in sub-Saharan Africa, where women make up nearly 43% of the labour force, nearly two-thirds of these women are employed in agriculture and, for the most part, as caregivers.

Economic growth needs women's jobs. But while women's employment has been shown to be a key driver of economic growth and development, disparities remain, with nearly half of women's productive potential in the world underutilized or unused (World Bank, 2011). According to the World Bank President, Jim Yong Kim, "Investing in women's jobs is not only appropriate, but also useful for business." According to a UN-funded study called the Millennium Project, two-thirds of independent entrepreneurs in SSA and Asia are women. In the non-agricultural sectors, the majority of them are employed as self-employed (in the sense of self-employed and family-help) in the informal sector, with the majority of the wage-earning employment being predominantly male. It is only in informal wage employment that their proportion takes over. While the profile of the self-employed farmer remains dominant in Africa, non-agricultural employment is almost half (48.4%) independent. This proportion rises to 69% in West Africa. This is the small share of salaried employment (United Nations (2000) (Chart 5.2, p. 110)).

Women's entrepreneurship is an increasingly recognized concept and is crucial in reducing poverty and unemployment in all sectors. The development of the economic activities of Benin women can have a positive impact in a number of areas. First, it can contribute to economic growth and can offer employment opportunities. It can also improve the social status, training, health status of women and their families, education and nutritional well-being and other progress, such as reduced child mortality and child malnutrition. Because when a woman has more means and resources for production, she transforms her prospects in all areas of her life, including employment, education, health, housing, social and political participation and physical security. Economically self-reliant women are better able to break the cycle of poverty and participate more in a more recognized way in political, economic and cultural activities.



In general, experience shows that considerable improvements (improving household incomes, food status and household living conditions) can be achieved when women's interests and abilities are taken into account and the varied but complementary roles of women and men are recognized. On the one hand, women's access to resources or factors of production is continually highlighted as a response to their limited contributions in viable economic activities in developing countries. On the other hand, women's control of resources is also seen as a key determinant of improving the well-being of household members in relation to their place in the household. In addition, businesses operated by women are an important source of income for many poor households. If these companies could increase productivity, they could be engines of inclusive growth. But the prospects of Benin women, especially in rural areas, to generate more substantial incomes are currently held back by a range of factors, including lack of basic skills, difficulties in accessing financial

services and the challenges associated with balancing business and family. This is why women entrepreneurs are significantly less willing to hire employees than men.

According to Brush and Cooper (2012) women businesses is one of the fastest growing entrepreneurial populations in the world. They make significant contributions to innovation, employment and wealth creation in all economies (Brush and Cooper, 2012). Fox and Sohnesen (2012) underline that given current constraints women face in the wage sector, household enterprises offer an important potential to increase household's welfare. This also suggests that governments in SSA countries should provide policy support in household enterprise employment. Lack of production inputs, like land, credit, water and other factors may explain the productivity gap between genders.

This thesis proposal raises the issue of women's empowerment, which remains a recurring topic. We are interested in this thesis proposal on the role of women in three important economic activities in poverty reduction, umemployment and food insecurity in Benin: agriculture, employment and entrepreneurship. Women account for 51.2% of the national population according to the Fourth General Census of Population and Habitat (RGPH 4) and in the agricultural sector 35.1% of women's assets nationally according to the Typology Report (CIR, 2014). Analysis of data from the second general business census (GBC 2, 2008) revealed that women are an important link in Benin's economy. They represent 49.99% of business leaders and work in various sectors of activity, with a predominance in trade and crafts. Women's empowerment is an essential part of addressing some of the challenges facing Benin today: food insecurity, poverty reduction, hunger, malnutrition and umemployment. Also, the promotion of women's entrepreneurship is one of the main aspects of women's economic empowerment. Removing barriers that prevent women from becoming more effective workers, entrepreneurs and women farmers could help many citizen in Benin and thus many households lift themselves out of poverty.



The integration of women into economic development has therefore become a necessity because the importance of women as a development agent is clear. It is with this in mind that the Benin state makes the promotion of women a real strategic lever for the fight against poverty. As a result, several comprehensive or sectoral policies for the promotion of women have been adopted in Benin. These include: (1) the National Policy for the Promotion of Women (2001), (2) the Policy for the Promotion of Women in the Agricultural and Rural Sector (2001) etc. In addition, the Beninese government's desire to make women's financial empowerment through entrepreneurship a priority with the creation in 2006 of a ministry responsible for microfinance, youth employment and the promotion of women. Each of these interventions is looking for ways and means to promote women's employment, entrepreneurship and agriculture to improve household living conditions.

The research questions to which we will try to provide answers in this thesis are: How has women empowerment (especially) in agricultural activities reduce vulnerability to household food insecurity ? In what ways also has the employment and entrepreneurship of the women of household contribute to reducing household poverty? In what ways also has domestic credit promote entreprenuership and promote and improve the contribution of entreprenuership women to the household ?

## *II - RESEARCH OBJECTIVES*

The main objective of this study is to make an analysis of women's empowerment in agriculture, employment and entrepreneurship with regard to household food security and poverty in Benin. The specific objectives of this research in relation to the above-mentioned research questions are:

1) Analyze the effect of women empowerment in agriculture on household food Security Index in Benin,
2) Analyze the effect of women's employment and entrepreneurship on Human Poverty Index in Benin,
3) Analyze the effect of domestic credit on entrepreneurship women in the household in Benin.

***III - CONTEXT***

In Benin, agriculture is of strategic weight in the social and economic tissue of the country, in terms of contribution to jobs creation, income generation and the creation of goods and services. More than 60% of the male workers and 36% of the female workers are actually involved in an agricultural profession. The agricultural sector accounts for 38% of GDP, employs 70% of the active population economically, provides about 70 to 80% of agricultural export receipts and contributes 15% to government revenue (UNDP-HDI, 2011; INSAE, 2015).

The study of the Global Analysis of Vulnerability and Food Security (CFSVA, 2013) in Benin showed that only 11% of the agricultural households surveyed practiced irrigation. In Benin, the rural environment, which occupies more than 80% of the labour force and whose living conditions remain difficult, about 56% of the female population lives in rural areas. Significant inequalities play against women in agriculture, particularly in several dimensions: - land ownership: 87% of land acquisition for men compared to 13% for women - access to credit: women have access to credit less access to "traditional" credit, often dependent on the existence of a land collateral, - the division of labour: it is estimated that women provide 60-80% of agricultural work and that they outnumber men (FAO, 2007), - access to agricultural equipment, including those related to the irrigation.



Food insecurity remains a concern in Benin. The study on the Comprehensive Food Security and Vulnerability Analysis (CFSVA, 2017) showed that 10% of the population investigated were food insecure. About 74% of households in food insecurity belong to the poorest household groups in the population. They spend more than 65% of their budget on their food costs (CFSVA, 2017). Rural households are more affected by food insecurity (12% moderate and 1% severe) than urban households (7% moderate). There is slightly more food insecurity among female-headed households (12%) than their male counterparts (9%), especially in rural areas (CFSVA, 2017). In addition, women's socio-economic status remains vulnerable. In fact, 27.59% of female-headed households are financially poor. Their non-monetary poverty index is 39.87%, or 1.4 times that of male-headed households (EMICoV 2011). The proportion of the rural poor is 38.4%, compared to 29.8% in urban areas according to the results of the EMICoV surveys in 2009 and 2011 (INSAE 2011).

Women make up more than 40% of the global workforce and one-third of business owners. In addition, no less than 80% of consumption spending is spent or influenced by women. However, women make up the majority of the population living in extreme poverty (1.2 billion people living in extreme poverty) on less than $1 a day (FAO, 2010; World Bank 2001; UN Women 2012). In Benin, employed women are in the 20-35 age group; house wives are found in all age groups but the majority in the 25-35 age group. Only 5.4% of women are jobs executives, skilled employees and

bosses. There are numerous in self-employment (86.4%) and 92.7% of women's activities are informal. The majority of unemployed women (64%) are under 35 years of age, while among men unemployment is most observed in the 35-45 age group (65.1%).

However, the majority of women entrepreneurs are without formal education. They undertake later and stay longer than their male counterparts. Individual companies and groups are favoured by women who are mostly at the head of companies with low social capital and turnover. Analysis of data from the Second General Census of Enterprises (RGE 2, 2008) revealed that women are an important link in the Benin economy. As a result, they represent a large pool of labour that is often under-exploited and undervalued.

It is therefore clear that The Goals One (1), two (2) and five (5) of Sustainable Development (SDGs) adopted in September 2015 are respectively "Eliminating Poverty in all its forms and all over the world"; "Eliminate hunger, ensure food security, improve nutrition and promote sustainable agriculture" and "Achieving gender equality and empowering all women and girls" are still compromised, reflecting the need to invest in these areas, to strengthen food security and nutrition, also financial status in order to achieve better food availability and accessibility, which improve the poverty, nutritional and food status of populations and improve protection of populations in areas at risk of food insecurity.



In addition, this research will provide information to the Government of Benin, which has recently been jointly involved with the World Food Programme (WFP) as part of an initiative called the National Zero Hunger Strategic Review by 2030. (PAM, 2018). The main objective of this national strategic review is to facilitate implementation and progress towards achieving SDG 1 and 2 for the elimination of hunger and improved nutrition in Benin that require a better living conditions.

According to official statistics on women, there is still a problem of empowerment, women with difficult living conditions despite the measures and programmes of the Benin government. There are several studies conducted in Benin on food security, employment and entrepreneurship, but in terms of women, there are few studies. We can note research such as: Dynamics of Female Entrepreneurship in Benin, Analysis of the level of empowerment of women in Agriculture of Benin.

However, there is no evidence of evidence on the link between women's employment in agriculture and household food security on the one hand and women's entrepreneurship and poverty on the other in Benin. This is a novelty in our case of study. Household food security is observed through four (04) dimensions of food security. Also, research on the effect of women's agricultural empowerment on food security taking into account the dimensions of food security is absent. In addition, part

of our research project focuses on the effect of women's agricultural empowerment on the food security Index. Women's agricultural empowerment take into account five (05) very important agricultural acquisitions (irrigation, access to land, the acquisition of organic fertilizers, chemical fertilizers and seeds) in agricultural farming, which is also a novelty in scientific research in Benin. And, the food security Index is the food stability who takes the need to access food in both short and long term. In the field of entrepreneurship, it is the effect of credit on women's entrepreneurship that is targeted in our case study, which is also an important contribution. In doing so, the study will contribute to empirical literature in these various areas. In addition, it will provide decision-makers with useful information to design appropriate empowerment policies for women by focusing on the results that will result from this thesis project.

## *IV- STYLISED FACTS*

Several comprehensive or sector-specific policies that are favourable to either the promotion of women or to promotion of gender, have been developed and adopted. These are the Women's Promotion Policy (2001), the Policy for the Promotion of Women in the Agricultural and Rural Sector (2001), the creation in 2006 of a ministry responsible for microfinance, youth employment and the promotion of women etc.

- The National Policy for the Promotion of Women (2001)

National Women's Promotion Policy adopted on 31 January 2001 which aims, through its strategic orientations, to "economic empowerment of women" and "improving and respecting the legal and social status of women". The 1997 Census of Permanent Agents of the State15 indicates that 26.8% were women (concentrated in social ministries) of which 65.9% in categories C or D and 47.3% were men in the same categories. In addition, 31.3% of women were categories A and B, compared to 44.3% of men. Finally, only 20% of workers in Category A are female. Women are more likely to be in category D (35,43%) and access higher incomes less frequently. Despite this government policy, the gender distribution in 2007 shows a male-dominated public service 73.23% of men versus 26.77% of women[1]. The percentage of women in government since the democratic revival, from 1991 to 2007, has fluctuated between 10 and 23%[2].



- The Policy on the Promotion of Women in the Agricultural and Rural Sector (2001)

The Policy on the Promotion of Women in the Agricultural and Rural Sector adopted September 2001, which has the overall objective of "contributing to the improvement of rural living conditions by giving women and men equal opportunities so that everyone can participate equally in Benin's development process". However, much remains to be done to enable rural women to increase access to labour, equipment, inputs and technologies, in short, credit or micro-credit. The difficulties in accessing agricultural credit, according to the results of the situational analysis, stem from difficulties in accessing land. To the extent that the granting of agricultural credit is subordinated, among other things, to the possession of an area of exploitable land, women are often less likely than men to access it. That's why the Policy National Women's Promotion in the Agricultural and Rural Sector (PPFR) proposes to encourage the relaxation of the criteria for selecting rural women's credit files,

[1] Single Reference File (FUR) 2007.

[2] Politique_nationale_promo_genrebenin

guarantees and to encourage medium- and long-term loans rural women. What led to the government of Benin has understood this need for facilitating and safeguarding access to and use of land and strengthening women's economic empowerment in the agricultural and rural sector through the New Alliance for Food Security and Nutrition (2018)[3]. This government project in partnership with development partners had materialized in the rural Couffo department by allowing some women access to land and breaking traditional customs.

- In addition, the Benin government's desire to make women's financial empowerment through entrepreneurship a priority with the creation in 2006 of a ministry responsible for microfinance, youth employment and the promotion of women. The government's program consists of an amount of $30,000 or more. The amount awarded depends on the possibility of repaying the beneficiary.
- The Women Business Promotion Center (WBPC) is one of those UNDP-supported Resource Centres that specifically manages the concerns of women entrepreneurs or entrepreneurs with entrepreneurship projects. As part of its program of activities, the Centre initiated training from March 25 to 31, 2015 to build the management capacity of 100 female entrepreneurs.



[3] Launched in Benin 2013, the New Alliance is a joint initiative between 10 African governments, more than 200 private investors, the G8 member states, the African Union, and the New Partnership for Africa's Development (NEPAD).

## *V - LITERATURE REVIEW*

The literature review is divided into three parts: the conceptual, the theoretical review and the empirical review.

### 5.1 Conceptual

We review here the definition of certain concepts related to our research theme.

**Food security:**

Food security refers to access by all people at all times physically, socially and economically to enough, sufficient, safe and nutritious food that meets their dietary needs and food preferences to maintain healthy and active life and food insecurity is the lack of this access (FAO, 2002). Food security is not narrowly defined as whether food is available, but whether the monetary and non-monetary resources at the disposal of the population are sufficient to allow everyone access to adequate quantities and qualities of food (Schmidhuber and Tubiello, 2007). The concept of food security is built on four (04) pillars (i) Food availability: sufficient quantities of food available on a consistent basis.(ii) Food access: having sufficient resources to obtain appropriate foods for a nutritious diet.(iii) Food utilization: appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation to derive sustenance food and (iv) Food stability : the need to access food in both short and long term.



**Food insecurity:**

Food insecurity is the lack of access to adequate, safe and nutritious food for all people at all times physically, socially and economically that meet their food needs and food preferences to maintain a healthy and active life. Vulnerability to food insecurity measures the degree of risk to family or community members when faced with life-threatening and livelihood situations.

**Food stability** : Food Security Index

The Consolidated Food Security Indicator Approach (CARI) approach was developed by World Food Programme to understand food security in all its dimensions. This approach allows food security indicators to be combined in a systematic and transparent manner in order to establish an explicit classification of households. The Food Security Index examines the fundamental issues of food accessibility, availability, quality and security. It therefore combines this ensemble of food security

indicators into a single indicator called the Food Security Index, which presents the overall status of the population's food security. This composite (or synthetic) food security score combines proxy indicators of food security and takes into account the two key dimensions of food security and the livelihood-based survival strategy indicator: (i) short-term state, for which the food consumption score is the key indicator, (ii) long-term access whose adaptability is measured against the share of food expenditure (an indicator measuring economic vulnerability) and (iii) asset depletion, adaptation strategies and/or household asset base (the indicator of survival strategies based on livelihoods), (Benin-CFSVA-Report-2013, Page 56 and 57).

Based on CARI, each household surveyed is classified according to a composite food security index (Food Security Index) in four (04) categories: food security, limit food security, moderate food insecurity or severe food insecurity. Here, in our study, we categorize households into two (02) groups. The first group consists of: food security and food security limit. The second group consists of: moderate food insecurity and severe food insecurity. The household belonging to the first group is in a state of food security and the household belonging to the second group is food insecure.



* Food security: household able to meet essential food and non-food needs without resorting to atypical coping strategies.
* Limited food security: household that has just adequate food consumption without resorting to irreversible coping strategies. Can't afford some essential non-food expenses.
* Moderate food insecurity: household that has poor food consumption or that cannot meet its minimum food needs without resorting to irreversible coping strategies.
* Severe food insecurity: household that has a very deficient food consumption or that experiences a very significant loss of its livelihood seating that will lead to significant deficits in its food consumption or worse.

**Employment, female (% of female employment)**

Employment in our research takes into account employment in services, employment in industry and also employment in agriculture. Employment is defined as persons of working age who were engaged in any activity to produce goods or provide services for pay or profit, whether at work during the reference period or not at work due to temporary absence from a job, or to working-time arrangement. The services sector consists of wholesale and retail trade and restaurants and hotels; transport, storage, and communications; financing, insurance, real estate, and business services; and community, social, and personal services. The industry sector consists of mining and quarrying, manufacturing, construction, and public utilities (electricity, gas, and water), in accordance with divisions 2-5 (ISIC 2) or categories C-F (ISIC 3) or

categories B-F (ISIC 4). The agriculture sector consists of activities in agriculture, hunting, forestry and fishing, in accordance with division 1 (ISIC 2) or categories A-B (ISIC 3) or category A (ISIC 4).

**Entrepreneurship, female (% of female employment)**

Entrepreneurship in our study concerns self-employment and employers.

- Self-employed, female (% of female employment) (modeled ILO estimate)

Self-employed workers are those workers who, working on their own account or with one or a few partners or in cooperative, hold the type of jobs defined as a "self-employment jobs." i.e. jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced. Self-employed workers include four sub-categories of employers, own-account workers, members of producers cooperatives, and contributing family workers.

- Employers, female (% of female employment) (modeled ILO estimate)

Employers are those workers who, working on their own account or with one or a few partners, hold the type of jobs defined as a "self-employment jobs" i.e. jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced), and, in this capacity, have engaged, on a continuous basis, one or more persons to work for them as employee(s).



**Empowerment, female**

Empowerment is about becoming self-ruling. An self-governing woman is independent. Agricultural empowerment is justified here by several agricultural achievements that farmers women own such as: land, irrigation systems, seeds, organic fertilizers and chemical fertilizers. All these agricultural assets possessed by women are captured by a single variable called women empowerment in agriculture. Women empowerment are also women who are employed or self-employed or employers. Investing in women's economic empowerment is the surest path to gender equality, eradicating poverty and hunger, and inclusive economic growth. Women make a huge contribution to the economy, whether in businesses, on farms, as entrepreneurs or employees, or through their unpaid work at home, where they care for their families. Yet, they also remain disproportionately affected by poverty, discrimination and exploitation. Gender discrimination often condemns women to precarious and low-paid jobs and allows only a small minority of them to reach high positions. It also restricts women's access to economic assets such as land and borrowing. It limits their participation in economic and social policy-making. And

finally, because women do most of the household chores, they often have little time to exploit new economic opportunities.

**Domestic credit to private sector (% of GDP)**

Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of nonequity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries these claims include credit to public enterprises. The financial corporations include monetary authorities and deposit money banks, as well as other financial corporations where data are available.

**Human Poverty Index (HPI)**

A Human Poverty Index (HPI) is an indicator that characterizes a country's poverty level. It was created by the United Nations Development Programme (UNDP). This index varies between 0 and 100, depending on 5 criteria rated from 0 to 20. Poverty is mainly estimated by the number of people living on incomes below a so-called "poverty" level, which in 2002 is USD 2 per day. Other poverty levels are set at $1, 4 and $11 per day, which helps refine the analysis; the income level of USD 1 per day is called the "extreme poverty level."

**Labor force, female (% of total labor force)**

Female labor force as a percentage of the total show the extent to which women are active in the labor force. Labor force comprises people ages 15 and older who supply labor for the production of goods and services during a specified period.



**Unemployment, female (% of female labor force)**

Unemployment refers to the share of the labor force that is without work but available for and seeking employment.

## 5.2 Theoretical Review

Women make essential contributions to agriculture and rural livelihoods. While their access to productive resources, such as land and capital, is often constrained, yet, women play a large role in food crop production (Chapoto et al., 2011). In addition, women are widely recognized as the face of agriculture, especially among smallholder farmers (USAID, 2009). As a means, gender-based constraints affect structure and relationships along the value chain (USAID, 2009). As a result, farms run by women have, on average, lower yields than those operated by men (World Bank, 2012). Productivity will increase if women's skills are fully exploited. Empowering rural women to produce more food for local consumption and local markets is believed to be the best path to reduce household vulnerability to poverty and food insecurity by increasing agricultural incomes and food availability (Baiphethi and Jacobs, 2009).

This argument has been advanced because women play key roles in the achievement of all 4 pillars of food security in rural areas, as producers of food, income earners and caretakers of household food and nutrition security (Bob, 2002; Galie, 2013). There is growing evidence that investments in women's empowerment contribute to improved broader development outcomes related to health, education, poverty reduction, reducing vulnerability to food insecurity and economic growth (Mayoux, 2006). By empowering women in agriculture, rural households can have sustainable ways of feeding themselves and get income from selling the surplus produced, thereby becoming less vulnerable to both poverty and food insecurity (ActionAid International, 2011). Women's 'empowerment in agriculture' is one of the most important dimensions of empowerment for rural women as rural households are largely dependent on agriculture for their livelihoods which, in turn, is crucial for reducing household vulnerability to food insecurity (IFAD, 2011). Women contribute the bulk of hours and do most of the work in agriculture (Alinyo & Leahy 2012, pp.340-341; FOWODE 2012, p.11). When women farmers can access the resources they need, their production increases, making it less likely that their families are hungry and malnourished (ICRW, 2012).



Women are restricted in their access to productive resources such as land, agricultural inputs, and extension services. Particularly land, a major input in agricultural production, is disproportionately controlled by men in all regions of the world (Deere and Leon, 2001, Quisumbing et al., 2004). Abrahamsson (2013) shows that in Zambia the difference between men and women in access to land, is structural and is the result of unequal access to resources, which have given men more power and influence. Savath et al. (2014) observe the importance of land as an essential asset for rural livelihoods and nutritional security because of its importance for paving the way for the wellbeing of the households. In Nicaragua and Honduras, Katz and Chamorro (2002) found that families spend more on food when the woman of the house own land. A study in Ghana showed that when women own a larger share of the household's farmland, families allocate a larger proportion of their household budget to food (Doss, 2006). Furthermore, when women own land, their food purchasing decisions are likely to benefit the household's food security and their children's nutritional status (World Bank, 2008). Santos et al. (2013) indicate that land rights have a direct link to the increasing food production and food security of the households. Mutangadura (2005) noted that water and land are the most fundamental resources to women's' living conditions economic empowerment and to some extent, their struggle for equity and equality. In most districts, men-headed households act as employers within the agriculture sector while women-headed households are largely employees (FOWODE 2012, p.8). Poor women often work in farming jobs for income (Alinyo & Leahy 2012, pp.340-341). McArthur and McCord (2017) estimate the role of agronomic inputs in increasing grain yields. They find fertilizer, improved seeds

and water as the main drivers of yield growth. Rhoades (1997) concluded that the increase in food production needed in developing countries should come mainly from irrigated land. Numerous empirical studies across the world have shown that irrigation has a positive impact on household food security and poverty (Dillon 2007; Mangisoni 2008; Omilola 2009; Gebregziabheri and Namara 2009).

According to the ILO, women's work, both paid and unpaid, may be the single most important poverty-reducing factor in developing economies (Heintz, 2006). Accordingly, higher Female Labor Force Participation (FLFP) and greater earnings by women could result in higher expenditure on school enrollment for children, including girls, potentially triggering a virtuous cycle, when educated women become female role models (Aguirre et al., 2012; Miller 2008*).* Stotsky (2006b) posits that women's relative lack of opportunities in developing countries inhibits economic growth, while at the same time, economic growth leads to improvements in their disadvantaged conditions. A rise in female employment could significantly boost growth and per capita income. Increasing women's participation in the labour force has become a key policy issue, particularly in developed economies that face a rapidly ageing and shrinking workforce (Steinberg and Nakane, 2012). Moreover, increasing female employment rates may be a key step in those economies that continue to suffer from significantly lower medium-term growth expectations (Cuberes and Teignier, 2012 ; Heintz, 2006). Productivity differentials among companies owned by men and by women have been found to be mainly the result of differences in access to productive inputs (Blackden and Hallward-Driemeier 2013). A reduction of this productivity gap through equal access to productive resources could yield considerable output gains (World Bank, 2011). Storey (2010) state that there is no greater initiative a country can take to accelerate the pace of entrepreneurial activity than to encourage more women to participate. In particular, self-employment in the informal sector is the sole-option for African women who have low educational levels and other challenges that result in them having fewer opportunities than men for wage income. Most women entrepreneurs are mainly practicing cross border trade and some are informal (Manyoni, 2011). Charmes (1998) shows women entrepreneurs have been drawn to this informal activity because of the possibility of earning higher incomes when compared to minimum government wages.

In West Africa, the majority of women entrepreneurs are part of the informal sector and the activity of which they have a virtual monopoly is street food trade (Hugon, 1989; Tinker, 1997; Ibro et al, 2006; Konayuma, 2006). Despite the economic development implications of women street food enterprises, women entrepreneurship in terms of the informal sector in Africa has remained largely unexplored by researchers (Charmes, 2000; Chen, 2001; Losby and Edgcomb, 2002). The lack of

research on informal women entrepreneurship has grossly underestimated the contribution of these enterprises to African economies (Xaba, 2002; Verick 2006). Yet women contribute to the rural and urban economic development of their countries through their greater involvement in credit schemes (Salia & Mbwambo, 2014), and job creation through micro-enterprises (Kuzulwa, 2005). The significance of the street food sector in poverty alleviation and economic development cannot be overemphasized (Martins and Anelich, 2000). Street food trade is important on at least three fronts. First, street food vending is an important entrepreneurial activity and income source for both the urban and rural poor, particularly women who are often the first victims of heightened poverty (Hugon, 1989; Tinker 2003). Second, it supplies inexpensive and nutritional foods for the urban poor who often can only afford to buy small quantities of food at a time (IFPRI, 2000). Finally, it promotes domestic agriculture as significant amounts of locally-grown crops such as cowpeas are used in the preparation of street foods (Fulton, 2006).

Difficult access to credit at start-up is therefore one of the least factors holding back female entrepreneurship. In light of several previous studies, there are significant disparities in access to financing by women entrepreneurs compared to their male counterparts. One example is Rachdi (2006), Orser and Carrington (2005) and Amine and Staub (2011), the following explain the differences between women and men in access to credit: (1) women and men bring different human capital to the company 2) women and men bring different social capital to the company; (3) women are more likely than men not to legalize their business; (4) women-owned enterprises are relatively smaller and more likely to operate in less promising sectors than those owned by men; (5) female owners are less likely than men to apply for equity financing. In the Lee-Gosselin study, Housieaux and Villeneuve (2010) the lack of collateral in the form of real estate and the profitability of companies are other reasons for the gap in access to credit between women and male entrepreneurs.



### 5.3 Empirical review

In Africa, women are known to produce up to 80% of the food (Mohammed, 2013). Yet, when it comes to agricultural inputs and services, the share going to women is meagre: they receive only 7% of agricultural extension services, less than 10% of the credit offered to small-scale farmers, and own only 1% of the land (UA, 2008). In this context, women are often found concentrated in subsistence agriculture and unpaid farm work, and excluded from more lucrative agricultural opportunities such as cash crop production. Men-headed households hold more than twice the size of women-headed households' land. The smaller land sizes of most women-headed households impede commercialization and prevent the use of land as collateral in

credit (FOWODE 2012, pp.4-5). Even when women-headed households have land, their level of asset depletion through sales is much higher than men-headed households', because women-headed households lack viable income to meet their basic needs and resort to selling land (FOWODE 2012, pp.4-5). Data analyzed by the OECD Development Centre show that countries where women lack rights or opportunities to own land have on average 60% more malnourished children than countries where women have some or equal access to land (OECD, 2012). Women's land rights are found to promote development by empowering women, increasing productivity, and improving welfare (Allendorf, 2007). A preliminary study of a land purchase program in the Indian state of Andhra Pradesh, which provided beneficiaries with plots of land of up to one acre, found that beneficiary households experienced significantly higher levels of food security: 76% of beneficiary households reported having two meals a day, compared to only 50-57% of non-beneficiary households (Hanstad and Nielsen, 2009). In Nepal, research demonstrated that the likelihood that a child is severely underweight is reduced by half if the child's mother owns land (Allendorf, 2007).



It has been reported that if women had the same access as men to productive resources such as land, credit, fertilizers, new technologies and extension services etc, they could increase their farm yields by 20-30%. This would have led to increased total agricultural production in developing countries, such as Benin, from 2.5 to 4% (World Bank, 2012, FAO, 2012a). In real sense, this increase could result in a 12% to 17% reduction in the number of people suffering from hunger in the world that is between 100 and 150 million people (World Bank, 2012, FAO, 2012a, Mohammed, 2013). As a result, women's access to arable land in quantity and quality, as well as the strength and extent of land rights, have a significant impact on the current and long-term food and economic well-being of rural households. In Bangladesh, accounting for potential endogeneity of empowerment, Esha et al. (2014) found that increases in women's empowerment in agriculture are positively associated with calorie availability and dietary diversity at the household level. In rural Msinga areas of KwaZulu-Natal, Stanley et al. (2015) have found that women's empowerment in agriculture reduces the likelihood that their households will be vulnerable to food uncertainty. Given that irrigated crop yields are double or more of comparable rainfed yields on the continent, irrigation development is considered by many as an important cornerstone for agricultural development in Africa. Irrigated area as a share of total cultivated area is estimated at only 6% for Africa, compared with 37% for Asia and 14% for Latin America (FAOSTAT, 2009). Nkhata et al. (2014) showed a positive impact of irrigation on daily per capita caloric intake, with both groups of irrigating farmers realizing similar improved levels of caloric intake over farmers that did not participate in the irrigation scheme.

According to the ILO in 2012, the gender gap in the labour force participation rate decreased globally in the 1990s from 27.9 to 26.1 percentage points, with men's rates falling faster than women's, in all regions. However, in the last decade, between 2002 and 2012, this gap remained constant, with both men's and women's participation rates falling equally. Three broad reasons cited for the fall in participation rates are, most importantly education for younger age cohorts, aging, and a "discouraged worker" effect. Women have been consistently launching new enterprises at twice the rate of men, and their growth rate of employment and revenue has outpaced the economy (Heilman and Chen, 2003). It has been established that male rate of entrepreneurial activity range from over 3 times that of females especially in the developing world, whereas it is almost identical in the developed world (Reynolds et al*.,* 2003). Street food vending is a critical part of the informal sector that employs on average 37.8 % of the labor force, and contributes about 38 % to total GDP (Charmes, 1998) in Africa. In particular, informal activity such as street food trade is growing rapidly in many African countries like Ghana and employs 20% of female labor force in that country (Maxwell et al., 2000). A survey by Charmes (1998) indicated that in 1992, street vendors accounted for 81% of all economic units in urban Benin, with over 75% owned and operated by women. Where credit has been accessible to street food entrepreneurs, there has been an "enviable record of success" in their enterprises (Cohen, 2000). It is increasingly clear that investments in women's empowerment are helping to improve broader development outcomes related to health, education, poverty reduction, and reducing vulnerability to insecurity food growth and economic growth (Mayoux, 2006).



In sub-Saharan Africa and in Southern Asia, a high proportion of women work as contributing family workers (34.9 % and 31.8 %, respectively) or as own-account workers (42.5 % and 47.7 %, respectively) (ILO, 2016). Moreover, no improvements are anticipated during the period up to 2021. Emerging countries, in contrast, have experienced a substantial reduction in the female share of contributing family workers, which decreased from 22.8 to 17 % between 2009 and 2018. Meanwhile, the share of women employed as own-account workers has increased by 2.4 percentage points, which suggests that the progress in narrowing the gap may be driven by the shift of some of these female workers from contributing family work to own-account work. In developed countries, the numbers of women in own-account and contributing family work are limited, accounting for just 6.9 and 1.6 % of total female employment, respectively, in 2018 (ILO, 2018). In West Africa, nearly three-quarters (74%) women employed outside agriculture are self-employed and, although they account for only 38% of these types of jobs, their predominance in the tertiary sector and particularly in trade (especially small street trade) sometimes makes them more visible as men in

these informal activities (Charmes, 2002 a). In Benin, where women account for more than 59.7% of informal sector jobs, they contribute 21.8% of non-agricultural GDP, or just half (51%) contribution of the informal sector as a whole (42.7%). In Kenya, where they account for more than 60% of informal sector employment, they contribute 42% of the GDP created by the informal sector. In Burkina Faso, where women account for only 40.9% of informal sector employment (in main activity, excluding secondary activities), their contribution to GDP is 28.6% out of a total contribution from the informal sector of 36.2% (almost 80%), which can be explained by the consideration of secondary activities in GDP. In Mali, where employment statistics take into account secondary activities, women account for 71.9% of informal sector employment and 62% (26.1/41.7) of the informal sector's contribution to GDP (Charmes (2000 & 2002a)).

These results highlight the need to integrate women more into the process of developing economic activities, given its involvement in the dynamics of agricultural and economic growth. It is in this context that all the problems that women face as workers, entrepreneurs and women farmers must be managed, given the wide variety of factors that hinder women's equitable participation in the (Onibon and Edon, 2015).

*VI- ANALYTICAL FRAMEWORK, METHODOLOGY AND DATA*

This section include the analytical framework and will be devoted to estimating the different models for the expectation of our various objectives above defined.

**6-1 Analytical framework**

The analytical framework of how women empowerment engenders food security, greater employment facilitation and entrepreneurship promotion and self-employment.

The conceptual framework behind this study is presented in Figure 1, which shows a process of schematic pathways by which women's empowerment would have a negative impact on household vulnerability to food insecurity and poverty. The framework of this study is based on the assumption that the increased participation of women in agriculture and income-generating activities could improve the status of food security and household poverty.

For women to be self-ruling, they have several schemes to achieve this. They may be salaried workers or self-employed. An self-governing woman has an occupation that provides her with income. She can be either a salaried employee or self-employed or employer.

There are also two types of entrepreneurship: agricultural entrepreneurship and non-agricultural entrepreneurship.

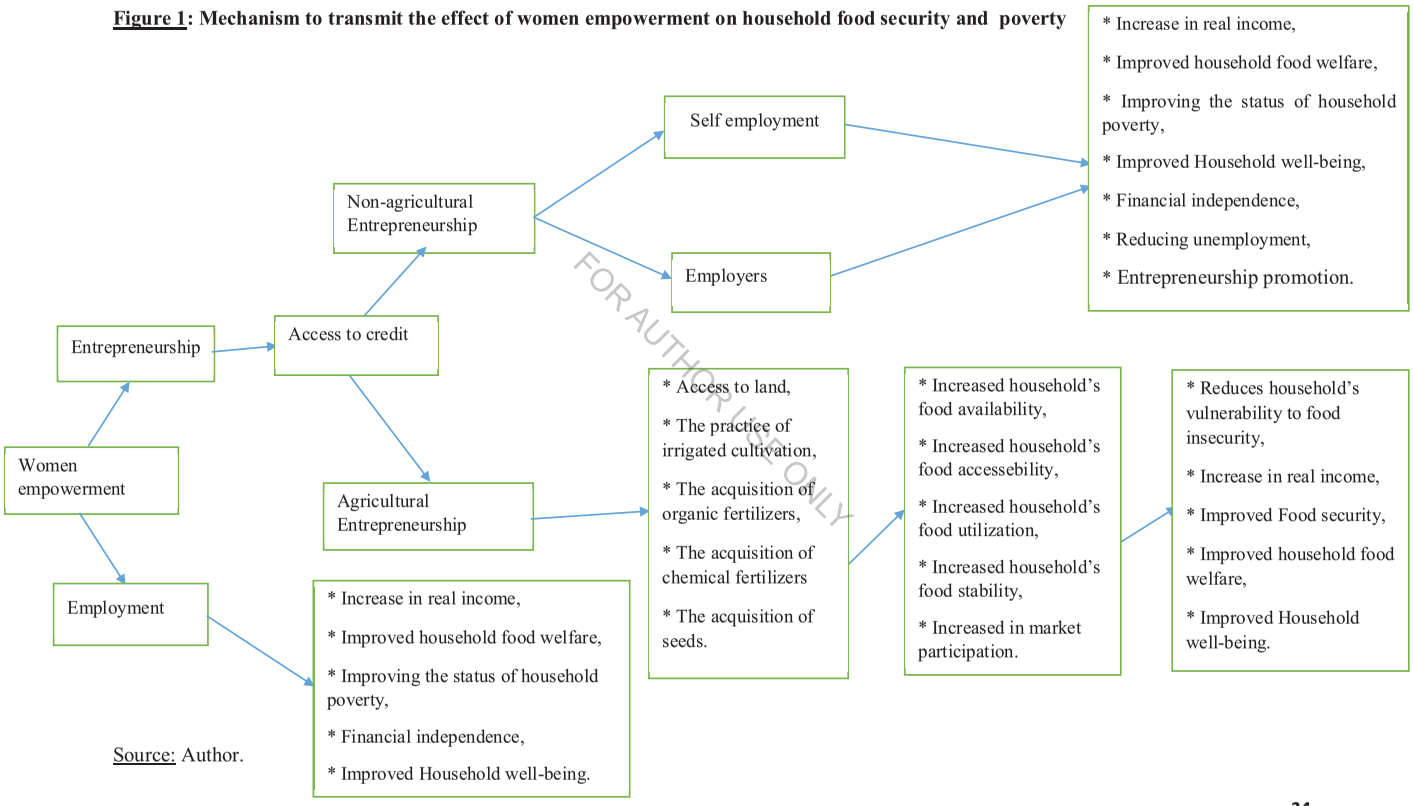


Agricultural entrepreneurship leads to women's agricultural empowerment, which is justified by the agricultural assets such as: access to land, irrigation systems, organic fertilizers, chemical fertilizers and seeds. Access to credit could enable the acquisition of agricultural inputs, employees if possible, agricultural equipment and training (Cohen, 2000). With the inputs needed for production available, there would certainly be increased food production. Increased agricultural production will help to resolve food insecurity problems, either directly through available agricultural production or indirectly through the provision of additional income from the sale of the surplus of agricultural production. As a result, the household would probably be food security and therefore the food welfare of the household is assured (Baiphethi and Jacobs, 2009). Significant agricultural production could not only be commercialized but also will allow the household to have and have access to food in quantity and quality at will. This will significantly reduce the household's vulnerability to food insecurity and will also generate more income, i.e. an increase in real income (ActionAid International, 2011) leading to an improvement in the household's financial situation. A woman with a lot of farm income will certainly improve the status of food security and also the well-being of her household (Bob, 2002; Galie, 2013).

Non-agricultural entrepreneurship can lead to self-employment or an employer. Access to credit could enable women non-agricultural entrepreneurs to accelerate their activities and further develop their business (Cohen, 2000). A woman who is employer or has an independent job, this gives her profits from her business activities. This leads to an increase in the real income and thus guarantees her financial independence (Mayoux, 2006). This leads to an improvement in the poverty status and food status of the household. It also means improving the well-being of the household. The direct consequences also include a reduction in unemployment and a promotion of employment in view of the impacts on society.

Employment provides employed women with a monthly income. This income provides an increase in real income for women. This can improve the food well-being and poverty status of the household. As a result, women will have financial empowerment and thus the well-being of the household is assured. A female who has a salaried employment could also engage in non-agricultural activities, i.e. non-agricultural entrepreneurship.

**Figure 1: Mechanism to transmit the effect of women empowerment on household food security and poverty**






Source: Author.

**6-2 Modelling the effect of women empowerment in agriculture on household food security index (Model 1)**

Sharaunga et al. (2015) have used also the binomial logit model to evaluate the impact of women's empowerment in agriculture on household vulnerability to food insecurity. Follwing this lead, this study used the logit model and as part of our binary logistic regression, our dependent variable : the Food Security Index is a binary variable which takes a value of 0 for vulnerable households to food insecurity (food insecurity) and 1 for non-vulnerable households to food insecurity (food security).

The cumulative logistic probability model was specified by Pindyck and Rubinfeld (1981) as:

$$Pi = F(Zi) = \frac{1}{1+ e^{-(\alpha+ \sum \beta i Xi)}} \quad (1)$$



where $P_i$ is the probability that a household :

- to being food security,
- given $X_i$ (the explanatory variables); $a$ and $\beta_i$ are parameters to be estimated.

For ease of exposition, the probability that a given household is to being food security is expressed as:

$$Pi = \frac{1}{1+ e^{-(Zi)}} \quad (2)$$

And the probability that a given household is to being food insecurity is 1 — *Pi*:

$$(1 - Pi) = \frac{1}{1+ e^{Zi}} \quad (3)$$

And thus,

$$\frac{Pi}{1-Pi} = \frac{1+ e^{Zi}}{1+ e^{-(Zi)}} \quad (4)$$

is the ratio between the probability that a household is to being food security to the probability of that it is to being food insecurity.

The log odds of the probability that a household is to being food security is given by:

$$Log\left(\frac{Pi}{1-Pi}\right) = Zi = \alpha + \beta 1X1 + \beta 2X2 + \cdots + \beta kXk \qquad (5)$$

If the disturbance term $\mu_i$ is taken into account the logit model becomes :

$$Zi = \alpha + \sum_{i=1}^{k} \beta iXi + \mu i \qquad (6)$$

*With* $Zi = (Y \neq 0 / X_i)$ *or* $Zi = (Y = 1 / X_i)$

*Yi is the* dependent variable (the outcome variable)

***Variable definition and hypothesis***

Descriptions of the variables hypothesised to influence vulnerability of households to food insecurity and included in the empirical model are given in the next table. These variables include agricultural forms of women's empowerment in addition to other household socio-economic characteristics. A household's socio-economic characteristics that influence food security include household size, age of the head of the household, the sex of the head of the household, education level and the residence of milieu (Albert and Collado, 2004).



Since women in rural areas are largely dependent on agriculture for their livelihoods (IFAD, 2011), households' vulnerability to food insecurity is greatly influenced by their levels of empowerment in agriculture. Women's empowerment in agriculture include their access to agricultural inputs as that affect agricultural production. All these assets of women's empowerment influence sustainable agricultural productivity and reduce vulnerability of household to food insecurity (Quisumbing and Meinzen-Dick, 2001).

Women's access of and control over physical/material assets were hypothesised to be negatively associated with the likelihood of a household becoming vulnerable to food insecurity because such assets are crucial for the pursuit of sustainable farm and off-farm livelihood strategies. These assets include ownership and control over land and the superficies of land as well as the goods and services produced from them (Uphoff, 2003).

Women's empowerment index in agriculture in this model is defined as women's empowerment in agriculture and captured by the practice of irrigated

cultivation, access to land, the acquisition of organic fertilizers, chemical fertilizers and seeds. Therefore, the treatment variable is women empowerment in agriculture in the household which takes the value of 1 and the value of 0 for women not empowerment in agriculture in the household.

The dependent variable of household food security (the outcome variable) is " the food security Index ".

We present the description of the variables that are used in this research in Table 1 and the descriptive statistics in Table 2.

***Table 1*: Description of the variables for Model 1**

| Variables | Description | Unit |
|---|---|---|
| **The outcome variable** | | |
| Food Security Index | The food security index brings together proxy indicators of food security and takes into account the two key dimensions of food security and the livelihood-based survival strategy indicator: (i) short-term state, for which the food consumption score is the key indicator, (ii) long-term access whose ability to adapt is measured in relation to the share of food expenditure and (iii) depletion of assets, and adaptation household asset base. | 0= Food insecurity and 1= Food security. |
| **The treatment variable** | | |
| Women's empowerment index in agriculture | The empowerment of women in agriculture is justified by the practice of irrigation cultivation, access to land, the acquisition of organic fertilizers, chemical fertilizers or/and seeds. | 0=Women not empowerment in agriculture and 1= Women empowerment in agriculture |
| **The explanatory or controls variables** | | |
| Age | The age of the head of household | Years |
| Education level | The level of education of the head of household | 0=None and literacy, 1=Primary, 2= At least Secondary, 3=Arabic curriculum and koranic school and 4=Other |
| Sex | The sex of the head of the household | 1=Male and 0=Female |
| Marital_status | The marital status of the head of the household | 1= Single & maried, 2=Separated & divorced and 3=Widowed & free union |
| Urban_rural | The residence of milieu | 1=Urban and 2=Rural |
| Household_size | The number of members in the household | Number of persons |
| Land_size | The superficies of land | 1= Less than 1 hectare to 1.99 ha and 2= 2 hectares and more |

Source: Using data from CFSVA (2017)

***Table 2: Statistiques descriptibles***

| Variables | All sample (6,502) | | Sample in which women's non empowerment in agriculture (1,765) | | Sample in which women's empowerment in agriculture (4,737) | | Mean-comparison test t-test |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | |
| Women's empowerment index in agriculture | 0.729 | 0.444 | - | - | - | - | |
| Food Security Index | 0.878 | 0.327 | 0.843 | 0.364 | 0.891 | 0.311 | -0.048*** |
| Age | 46.466 | 14.119 | 45.994 | 14.452 | 46.641 | 13.990 | -0.647* |
| Sex | 0.890 | 0.312 | 0.896 | 0.305 | 0.888 | 0.315 | 0.008 |
| Education level | 1.452 | 0.755 | 1.483 | 0.746 | 1.441 | 0.758 | 0.042** |
| Urban rural | 1.741 | 0.438 | 1.738 | 0.440 | 1.742 | 0.437 | -0.004 |
| Marital status | 1.143 | 0.500 | 1.165 | 0.528 | 1.135 | 0.489 | 0.030** |
| Household size | 10.374 | 5.941 | 10.651 | 6.163 | 10.271 | 5.854 | 0.380** |
| Land size | 1.608 | 0.488 | 1.459 | 0.498 | 1.664 | 0.473 | -0.205*** |



La significativité des différences en moyennne est indiquée avec *** p<0,01, ** p<0,05, * p<0,10,

Source: Using data from CFSVA (2017).

The results of the descriptive statistic presented in table 2 clearly show that the variable women's empowerment index in agriculture is negatively associated with variables such as education level, marital status and household size. On the other hand, variables such as food security index, age and land size are positively associated with women's empowerment index in agriculture. The food security index is higher in the rank of women's empowerment in agriculture than women's non empowerment in agriculture. Women's empowerment in agriculture are older and have fewer people in their households than women's non empowerment in agriculture. There are more women's empowerment in agriculture in rural areas. The significance test of the differences on average between women's empowerment in agriculture and women's non empowerment in agriculture and explanatory variables shows that the food security index and land size are significant at 1%, age is significant at 10%; education level, marital status and household size are significant at 5%. On the other side, sex and residence of milieu are not significant.

## 6-3 Modelling the effects of women's employment and entrepreneurship on Human Poverty Index (HPI) in Benin (Model 2) and Modelling the effect of domestic credit on the promotion and contribution of entrepreneurship women in the household in Benin (Model 3)

The study makes use of time series data collected between the period 1990 to 2019 in Benin. The data consists of Human Poverty Index (HPI) ; Total Employment, female ; Total Entrepreneurship, female and Domestic credit to private sector (% of GDP) of Benin for the period 1990 to 2019 on an annual basis. To estimate the both models, a vector Autoregressive model (VAR) will be used.

### 6-3-1 Model Specification

The model based on the neo-classical theory of poverty using Vector Auto Regressive (VAR) is adapted from the work of Granville and Mallick (2006) and restricted to incorporate the effect of employment and entrepreneurship on Human Poverty Index (HPI) in Benin and also the effect of domestic credit on entrepreneurship women in the household in Benin. This method will allow us to estimate the long-run effect of Employment, female and Entrepreneurship, female on Human Poverty Index (HPI) and also considering the shortrun dynamism. This method will allow also us to estimate the long-run effect of domestic credit on entrepreneurship women in the household and also considering the shortrun dynamism.



Conventionally the VAR model is given as:

$$Y_t = \alpha \sum_{j=1}^{m} Y_{t-i}\ \emptyset_j + \mu_t, \qquad \mu_t \sim IID(0,\sigma 2) \qquad (7)$$

Where,

$Y_t$ = Vector of endogenous variables in the system at time t, the current period

$\alpha$ = vector of constant term

$Y_{t-i}$ = Lagged endogenous variables. This captures the effect of the variables in the system as suggested by Sims.

$\emptyset_j$ = the matrix of the coefficients of the variables in the system

m = lag length

$\mu_t$ = the vector of random disturbance error term, which are assume to be independently and identically distributed error term with zero mean and finite variance.

❖ **Modelling the effects of women's employment and entrepreneurship on Human Poverty Index (HPI) in Benin (Model 2)**

Instructively, this study employs a three variables VAR model comprising of Human Poverty Index (HPI) ; total employment, female and total entrepreneurship, female.

Thus, the VAR models can be specified below.

$$HPI_t = \beta_0 + \sum_{j=1}^{m} \beta_{1j} HPI_{t-j} + \sum_{j=1}^{m} \beta_{2j} Empl_{t-j} + \sum_{j=1}^{m} \beta_{3j} Entrep_{t-j} + \mu_{1t} \quad \ldots\ldots\ldots(8)$$

Where,
HPI represents Human Poverty Index; Empl is the total employment, female and Entrep is total entrepreneurship, female. $\beta_0$ is constant parameter, $\beta_1 - \beta_3$ are coefficients to be estimated, $\mu_{1t}$ is the Gaussian white noise that are independently and identically distributed random variable.



❖ **Modelling the effect of domestic credit on the promotion and contribution of entrepreneurship women in the household in Benin (Model 3)**

Instructively, this part of the study also will uses three variables VAR model comprising of total entrepreneurship, female ; domestic credit to private sector (% of GDP) and poverty headcount ratio (% of population).

Therefore, the VAR models can be also specified below.

$$Entrep_t = \alpha_0 + \sum_{j=1}^{m} \alpha_{1j} Entrep_{t-j} + \sum_{j=1}^{m} \alpha_{2j} Credit_{t-j} + \sum_{j=1}^{m} \alpha_{3j} Labor_{t-j} + \sum_{j=1}^{m} \alpha_{4j} Unempl_{t-j} + \nu_{1t} \quad \ldots\ldots\ldots(9)$$

Where,
Entrep represents total entrepreneurship, female; Credit is domestic credit to private sector (% of GDP) ; Labor is Labor force, female (% of total labor force) and Unempl is Unemployment, female (% of female labor force). $\alpha_0$ is constant parameter, $\alpha_1 - \alpha_4$ are coefficients to be estimated, $\nu_{1t}$ is the Gaussian white noise that are independently and identically distributed random variable.

**6-3-2 Stationarity Test**

And as such, the time series properties of the data will be first investigated. In order to verify the stationarity of the variables, the Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) test unit root test used. The reason these tests where selected is informed by the imperatives of comparison and consistency. According to

Hamilton (1994), the PP unit root test is generally considered to have a greater reliability than the ADF because it is robust in the presence of serial correlation and heteroscedasticity, though it has its own shortcomings. To test for stationarity, the unit root method used and take into account the form of an Autoregressive model (AR(1) process), with each variable regressed on its own lagged value without an intercept and a deterministic trend. To correct for autocorrelation in the error term,
the ADF unit root test will be applied.The model used is:

$\Delta Y_t = \delta Y_{t-i} + \mu_t$ ..... *(10)*

$\delta=\rho-1$

Where,
$Y_t$ represents all the variables under consideration.
$\delta$ represents the coefficient of the lagged value of Y.
$\Delta$ is the first difference operator.
$Y_{t-i}$ represents the lagged terms included
$\mu_t$ represents pure white noise error term.



The null hypothesis to be tested is such that the variable possess unit root, and as such is non stationary.

$H_0 : \delta = 0$ ($\rho = 1$) presence of unit root
$H_1 : \delta \neq 0$ ($\rho < 1$) no unit root

The decision rule will be such that if the absolute ADF and PP statistic is greater than the absolute critical values, the null hypothesis will be rejected.

### 6-3-3 Co-integration Estimate

After testing for the stationarity, if the variables are found to be non-stationary, then a linear combination of them are tested to know whether they are stationary. This is used to establish the number of co-integrating vectors using Johansen's methodology which have two test statistics which are the trace test statistic and the maximum Eigen-value test statistic. The trace statistic tests the null hypothesis that the number of deviating co-integrating relationships is less than or equal to 'r' alongside the alternative hypothesis of more than 'r' co-integrating relationships, and is defined as:

$o_{trace}\ (r) = -T \sum_{j=r+1}^{p} ln(1 - \hat{o}j)$ .....*(11)*

The maximum likelihood ratio or the maximum Eigen-value statistic, for testing the null hypothesis of at most 'r' co-integrating vectors alongside the alternative hypothesis of 'r+l' co-integrating vectors, is given by:

$$o_{max}(r, r+1) = -T\,ln(1-\hat{o}_{r+1})\; o_{trace}(r) = -T\sum_{j=r+1}^{p} ln(1-\hat{o}j) \qquad \ldots\ldots\ldots(12)$$

Where,

$\hat{o}_j$ = the Eigen values, T = total number of observations. Johansen argues that, trace and statistics have nonstandard distributions under the null hypothesis, and provides approximate

critical values for the statistic, generated by Monte Carlo methods (Haug, 1996). In a condition where Trace and Maximum Eigen value statistics give up dissimilar results, the results of trace test should be favored.

If cointegration relationship exist, then in the third step we construct the error correction framework to investigate the short run coefficient. ECM indicates the adjustment speed in the following year if there is any disturnbance in the equilibrium. $ECM_{t-1}$, is the error correction model. The calculated sign of coefficient of ECM is negative and its statistical significance is indication of long run cointegration (Kremers *et al.,* 1992).



### 6-4 The data

To achieve the first objective, we will use data from the Global Vulnerability and Food Security Analysis (GVFSA) survey held in 2017. The survey focuses on information on areas such as demography and education, migration, household housing and equipment, food consumption and food sources, source of income and livelihoods, credit and expenditure, agriculture, livestock, shocks and household survival strategies, transportation and communication. It is a national, departmental and resident-based survey. For the purposes of this study, we will limit the sample to households that farmed during the last crop year 2016. About 6,502 households farmed in the last campaign before the survey. We focus on farm households where women in the household own such as: land, irrigation systems, seeds, organic fertilizers and chemical fertilizers (1,765) and those who own not (4,737).

We will also use World Bank data (WDI, 2019), which are also secondary to achieving the other two goals related to women's employment and entrepreneurship. Our empirical analysis covers the period 1980-2019. Data on the Human Poverty Index (HPI) are collected in the global Human Development Reports.

## *VII- RESULTS AND DISCUSSION*

This section is devoted to the presentation of the results and discussions from the different econometric estimates. The results presented are linked to the different models relating to the specific research objectives.

### 7-1 Results and discussion of effect of women empowerment in agriculture on household food Security Index in Benin

We present the results followed by the discussion of the effect of women empowerment in agriculture on household food Security Index in Benin. The results of the logistic regression model estimation are reported in Table 3.

***Table 3 : Effect of women empowerment in agriculture on household food Security Index***

| | ***Logistic regression*** | | | |
|---|---|---|---|---|
| | | ***Food Security Index*** | | |
| | Coefficient | Stand. Error | P>\|z\| | Marginal effects (dy/dx) |
| Women's empowerment index in agriculture | 0.3785*** | 0.0828 | 0.000 | 0.0397*** |
| Age | 0.0016 | 0.0028 | 0.569 | 0.0002 |
| Sex | 0.2160 | 0.1339 | 0.107 | 0.0227 |
| Education level | 0.3155*** | 0.0621 | 0.000 | 0.0331*** |
| Urban rural | -0.4089*** | 0.0962 | 0.000 | -0.0429*** |
| Marital status | -0.0952 | 0.0819 | 0.245 | -0.00999 |
| Household size | 0.0103 | 0.0065 | 0.112 | 0.0011 |
| Land size | 0.3438*** | 0.0819 | 0.000 | 0.0361*** |
| Constant | 1.2023*** | 0.3244 | 0.000 | |
| Number of observations | 6,502 | | | |
| LR chi2(8) | 113.57 | | | |
| Prob > chi2 | 0.0000 | | | |
| Pseudo R2 | 0.0236 | | | |
| Log likelihood | -2350.3145 | | | |

Note: Niveau de significativité est indiqué avec *** p<0,01, ** p<0,05, * p<0,10.



The estimates made it possible to retain from the analysis of table 3 four (04) explanatory variables whose coefficients are all significant at 1% : Women's empowerment index in agriculture, level education, urban rural and land size.

Analysis of the estimated coefficient of women's empowerment index in agriculture shows that women's empowerment index in agriculture is positively

correlated with food security index. Thus, the likelihood of a household being food security increases when women's empowerment in agriculture increases. The results of some research are consistent with our results. In Bangladesh, accounting for potential endogeneity of empowerment, Esha et al. (2014) found that increases in women's empowerment in agriculture are positively associated with calorie availability and dietary diversity at the household level. In rural Msinga areas of KwaZulu-Natal, Stanley et al. (2015) have found that women's empowerment in agriculture reduces the likelihood that their households will be vulnerable to food uncertainty. By empowering women in agriculture, rural households can have sustainable ways of feeding themselves and get income from selling the surplus produced, thereby becoming less vulnerable to both poverty and food insecurity (ActionAid International, 2011). Women's 'empowerment in agriculture' is one of the most important dimensions of empowerment for rural women as rural households are largely dependent on agriculture for their livelihoods which, in turn, is crucial for reducing household vulnerability to food insecurity (IFAD, 2011; ICRW, 2012). Women's agricultural empowerment increases the household food security index by 3.97 percentage points.

The results estimates show also that land size are significant at 1% and positively influence the household food security index. Thus, the likelihood that a household is in a state of food security increases as the area of land sown increases. OECD work in 2012 confirmed this result by showing that countries where women have the opportunity to own land, their children are better fed, which improves and increases the household food security index (Hanstad et Nielsen, 2009). Allendorf's roadworks in 2007 also consistents with this result by demonstrating that the probability of a child suffering from severe food deficiency is halved if the child's mother owns land. In addition, Doss in 2006 also showed that when women own a larger share of farmland in the household, families allocate a larger share of their family budget to food. On the other hand, when the women in the household own land, families spend more on food, reducing the household's vulnerability to food insecurity by increasing agricultural income and food availability (Katz and Chamorro, 2002; Baiphethi and Jacobs, 2009). The area of land sown increases the household food security index by 3.61 percentage points.



The estimates also revealed that the education level is significant at 1% and positively impacts the household food security index. Thus, the probability that a household is food security increases when education level of the woman in the household increases. Investments in education are needed to break the vicious cycle of food insecurity and malnutrition. The Food and Agriculture Organization of the United Nations (FAO) supports the significant contribution that education can make to countries' efforts to achieve food security and build a healthy society. Eating habits are assimilated early and education can play an important role in promoting healthy

and sustainable diets (FAO, 2012a). Women's level of education increases the household food security index by 3.31 percentage points.

The results showed that the residence of milieu (Urban rural) is significant at 1% and negative. Thus, the likelihood of a household being food security decreases in rural areas. This result proves that rural areas are more vulnerable to food insecurity than urban areas. Across all countries, people living in rural areas are most at risk of food insecurity due to limited access to food resources (FAO, 2015). Rural areas reduce the household food security index by 4.29 percentage points.

## 7-2 Results and discussion of effect of women's employment and entrepreneurship on Human Poverty Index in Benin

We present the results of the discussion of effect of women's employment and entrepreneurship on Human Poverty Index in Benin.

***Table 4.1 : Unit Root test Result***



| Variables | ADF-Fisher | | PP-Fisher | | Order of Integration |
|---|---|---|---|---|---|
| | Constante | Trend | Constante | Trend | |
| HPI | -2.1320 (0.0309) | -5.5123 (0.0002) | -1.7259 (0.0592) | -5.4736 (0.0002) | |
| D(HPI) | -21.2440*** (0.0000) | -21.2440*** (0.0000) | -21.2440*** (0.0000) | -21.2440*** (0.0000) | I(1) |
| Employment | -3.0082 (0.0074) | -3.0616 (0.0068) | -1.5333 (0.0798) | -0.9324 (0.1877) | |
| D(Employment) | -3.9961*** (0.0016) | -2.9367*** (0.0083) | -3.9961*** (0.0016) | -2.9367*** (0.0083) | I(1) |
| Entrepreneurship | -1.3804 (0.1004) | -6.4700*** (0.0001) | -1.5762 (0.0747) | -6.1428 (0.0001) | |
| D(Entrepreneurship) | -20.4855*** (0.0000) | -17.2260*** (0.0000) | -21.2440*** (0.0000) | -18.8408*** (0.0000) | I(1) |

Values marked with a *** represent stationary variables at 1% significance level, and **

represent stationary at 5% and * represent stationary variables at 10%.

The Three variables (HPI, Employment, and Entrepreneurship) underwent unit root test using the Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) test. All three variables were found to be non-stationary at levels but were stationary at first difference I(1).

**Cointegration Test Result (Johansen's Co-Integration Result)**

This section presents results of long-run cointegration relationship which anchored on Trace Statisitics and Max-Eigen Statisitics as reported in table 4.2 and table 4.3.

***Table 4.2: Cointegration Test Result 1***

| Hypothesized No. of CE(s) | Eigen value | Trace Statistic | 0.05 Critical Value |
|---|---|---|---|
| 0 | | 45.4286 | 29.68 |
| 1 | 0.59658 | 10.0256* | 15.41 |
| 2 | 0.14238 | 4.0354 | 4.0354 |

Note: Trace statistics shows one cointegration equation at the 0.05 sig. level.

***Table 4.3: Cointegration Test Result 2***

| Hypothesized No. of CE(s) | Eigen value | Max-Eigen Statistic | 0.05 Critical Value |
|---|---|---|---|
| 0 | | 35.4030 | 20.97 |
| 1 | 0.59658 | 5.9902* | 14.07 |
| 2 | 0.14238 | 4.0354 | 3.76 |

Note : Max-Eigen value shows one cointegration equation at 0.05 sig.level.

Both the trace statistics value and maximum Eigen value indicate evidence showing long-run cointegration within the series. The calculated trace value and maximum Eigen test value is greater than there respective 5 percent critical values, hence the null that there is no long-run relationship is discarded. On the other hand the estimated trace test and maximum Eigen test statistics is less than there respective 5 percent critical values, hence the null that there is one long-run relationship can not be discarded. This implies that there is only single long-run association among Human Poverty Index, Female employment and Female entrepreneurship.



***Table 4.4 VAR Lag Order Selection Criteria***

| lag | LL | LR | FPE | AIC | HQIC | SBIC |
|---|---|---|---|---|---|---|
| 0 | -159.658 | NA | 1.68702 | 9.03655 | 9.08261 | 9.16851 |
| 1 | -116.63 | 86.056 | 0.255439 | 7.1461 | 7.33033 | 7.67394 |
| 2 | -102.456 | 28.348 | 0.193992 | 6.85865 | 7.18105 | 7.78237 |
| 3 | -88.9138 | 27.084 | 0.155309 | 6.60632 | 7.0669 | 7.92592 |
| 4 | -66.4427 | 44.942* | 0.077817* | 5.85793* | 6.45667* | 7.5734* |

* indicates lag orde r selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
HQ: Hannan-Quinn information criterion
SC: Schwarz information criterion

To carryout VAR analyses on the variables, the fourth lag will be selected since all the lag selection criteria chose the fourth lag.

*Table 4.5: Estimated long run coefficient*

| Dependent Variable: Human Poverty Index | | | | |
|---|---|---|---|---|
| Variables | Coefficient | Std. Error | t-Statistic | (Prob) |
| Employment | 0.4269059 | 0.5220455 | 0.82 | 0.413 |
| Entrepreneurship | -3.733604 | 1.606675 | -2.32 | 0.020** |
| cons | 359.178 | 166.9957 | 2.15 | 0.031** |

Legend: * p<0.1; ** p<0.05; *** p<0.01

It is found that in the long run, female entrepreneurship is significant at 5 percent and negatively associated with Human Poverty Index. Thus in the long run, we find that female entrepreneurship reduces Human Poverty Index. This is consistent with the theory that the development of entrepreneurship induces an increase in income that leads to a reduction in poverty. This result is also coherent with Tinker's work in 2003 which explains that entrepreneurial activity is a source of income especially for women who are often the first victims of increased poverty. Mayoux (2006) also argues that entrepreneurship may be the single most important poverty-reducing factor in developing economies.

*Table 4.6: Estimated short run Coefficient*

| Dependent Variable: Human Poverty Index | | | | |
|---|---|---|---|---|
| Variables | Coefficient | Std. Error | t-Statistic | (Prob) |
| Employment | -2.748194 | 0.6531247 | -4.21 | 0.000*** |
| Entrepreneurship | 5.756981 | 1.471023 | 3.91 | 0.000*** |
| cons | -331.778 | 161.4591 | -2.05 | 0.040** |
| ECM | -0.5993374 | 0.2212595 | -2.71 | 0.007*** |

Legend: * p<0.1; ** p<0.05; *** p<0.01



After examining the long-run association among Human Poverty Index and its determinants we proceed to check the short-run dynamic within the error correction framework.

Table 4.6 shows short run causality results. For the regression by Human Poverty Index (HPI) as lef hand side variable, the calculated paramter of ECM has minus sign and significant at 1 percent. This error correction term is evidence of long-run cointegrating relationship running from employment and entrepreneurship to Human Poverty Index (HPI).

The result of short run reveals that female employment is significant at 1 percent and negatively associated with Human Poverty Index. Thus, in the short term, female employment reduces Human Poverty Index. According to the ILO, women's work, both paid and unpaid, may be the single most important poverty-reducing factor in developing economies (Heintz, 2006). In addition, Steinberg and Nakane (2012) confirm that a rise in female employment could significantly boost per capita income which may imply poverty reduction.

The result of short run reveals that female entrepreneurship is significant at 1 percent and positively interconnected to Human Poverty Index. In the short term too, female entrepreneurship leads to an increase in the Human Poverty Index. The start of entrepreneurship requires significant short-term financial costs that may impoverish, but in the long term, this investment would be promising to increase incomes.

Number of additional tests were applied and it does not show any evidence in opposition to the reliability of long-run regression equation. LM test for serial correlation could not reject the null of no serial correlation meaning error terms are normally distributed.

### 7-3 Results and discussion of effect of domestic credit on entrepreneurship women in the household in Benin.

We present the results of the discussion of effect of domestic credit on entrepreneurship women in the household in Benin.

***Table 5.1 : Unit Root test Result***



| Variables | ADF-Fisher | | PP-Fisher | | Order of Integration |
|---|---|---|---|---|---|
| | Constante | Trend | Constante | Trend | |
| Entrepreneurship | -1.3804<br>(0.1004) | -6.4700<br>(0.0001) | -1.5762<br>(0.0747) | -6.1428<br>(0.0001) | |
| D(Entrepreneurship) | -20.4855***<br>(0.0000) | -17.2260***<br>(0.0000) | -21.2440***<br>(0.0000) | -18.8408***<br>(0.0000) | I(1) |
| Credit | -0.0900<br>(0.4651) | 1.7057<br>(0.9389) | -0.0700<br>(0.4729) | 1.8754<br>(0.9533) | |
| D(Credit) | -12.9080***<br>(0.0000) | -12.0381***<br>(0.0000) | -12.7586***<br>(0.0000) | -11.8958***<br>(0.0000) | I(1) |
| Labor force | -1.0953<br>(0.1509) | -3.9200<br>(0.0018) | -0.6636<br>(0.2618) | -3.7935<br>(0.0021) | |
| D(Labor force) | -21.2440***<br>(0.0000) | -21.2440***<br>(0.0000) | -21.2440***<br>(0.0000) | -21.2440***<br>(0.0000) | I(1) |
| Unemployment | 1.1503<br>(0.8602) | 0.4842<br>(0.6801) | 1.1086<br>(0.8518) | 0.4299<br>(0.6613) | |
| D(Unemployment) | -8.7024***<br>(0.0000) | -7.0483***<br>(0.0000) | -8.7032***<br>(0.0000) | -7.0519***<br>(0.0000) | I(1) |

Values marked with a *** represent stationary variables at 1% significance level, and ** represent stationary at 5% and * represent stationary variables at 10%.
The four (04) variables (Entrepreneurship, Credit, Labor force and Unemployment) underwent unit root test using the Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) test. All four variables were found to be non-stationary at levels but were stationary at first difference I(1).

**Cointegration Test Result (Johansen's Co-Integration Result)**

This section presents results of long-run cointegration relationship which anchored on Trace Statisitics and Max-Eigen Statisitics as reported in table 5.2 and table 5.3.

***Table 5.2: Cointegration Test Result 1***

| Hypothesized No. of CE(s) | Eigen value | Trace Statistic | 0.05 Critical Value |
|---|---|---|---|
| 0 | | 82.0209 | 47.21 |
| 1 | 0.82003 | 15.1367* | 29.68 |
| 2 | 0.27265 | 2.7214 | 15.41 |
| 3 | 0.05355 | 0.5749 | 3.76 |

Note: Trace statistics shows one cointegration equation at the 0.05 sig. level.

***Table 5.3: Cointegration Test Result 2***

| Hypothesized No. of CE(s) | Eigen value | Max-Eigen Statistic | 0.05 Critical Value |
|---|---|---|---|
| 0 | | 66.8842 | 27.07 |
| 1 | 0.82003 | 12.4154* | 20.97 |
| 2 | 0.27265 | 2.1465 | 14.07 |
| 3 | 0.05355 | 0.5749 | 3.76 |

Note: Max-Eigen value shows one cointegration equation at 0.05 sig.

Both the trace statistics value and maximum Eigen value indicate evidence showing long-run cointegration within the series. The calculated trace value and maximum Eigen test value is greater than there respective 5 percent critical values, hence the null that there is no long-run relationship is discarded. On the other hand the estimated trace test and maximum Eigen test statistics is less than there respective 5 percent critical values, hence the null that there is one long-run relationship can not be discarded. This implies that there is only single long-run association among entrepreneurship, Credit, Labor force and Unemployment.



***Table 5.4 VAR Lag Order Selection Criteria***

| lag | LL | LR | FPE | AIC | HQIC | SBIC |
|---|---|---|---|---|---|---|
| 0 | -233.442 | NA | 6.29511 | 13.1912 | 13.2526 | 13.3672 |
| 1 | -126.741 | 213.4 | 0.041089 | 8.15227 | 8.45932 | 9.032 |
| 2 | -95.9499 | 61.582 | 0.018729 | 7.33055 | 7.88324 | 8.91407 |
| 3 | -70.6379 | 50.624 | 0.012254 | 6.81322 | 7.61155 | 9.10052 |
| 4 | -33.6806 | 73.915* | 0.004622* | 5.64892* | 6.6929* | 8.64002* |

* indicates lag orde r selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
HQ: Hannan-Quinn information criterion
SC: Schwarz information criterion

To carryout VAR analyses on the variables, the fourth lag will be selected since all the lag selection criteria chose the fourth lag.

*Table 5.5: Estimated long run coefficient*

| Dependent Variable: Female entrepreneurship | | | | |
|---|---|---|---|---|
| Variables | Coefficient | Std. Error | t-Statistic | (Prob) |
| Credit | 0.0009884 | 0.0049242 | 0.20 | 0.841 |
| Labor force | -0.0930075 | 0.0192636 | -4.83 | 0.000*** |
| Unemployment | -0.1847041 | 0.0557347 | -3.31 | 0.001*** |
| cons | 105.9075 | 14.18431 | 7.47 | 0.000*** |

Legend: * p<0.1; ** p<0.05; *** p<0.01.

It is found that in the long run, Labor force is significant at 1 percent and negatively associated with Entrepreneurship. Thus, in the long run, labor force reduce Entrepreneurship. Indeed, an increase in labor force decreases Entrepreneurship. This is obvious because the effect of a minority of enterprising women in the face of the high presence of women of working age would be less. The effect of labor force on Entrepreneurship would not be felt again because of the greater increase in labor force compared to Entrepreneurship very low.

It is found that in the long run, Unemployment is significant at 1 percent and negatively associated with Entrepreneurship. Thus, in the long run, Unemployment reduce Entrepreneurship. Thus, we notice that an increase in Unemployment leads to a decrease in Entrepreneurship. When the number of unemployed people is very high and Entrepreneurship is revealed to be very low, the effect of Unemployment on Entrepreneurship would not be visible. This explains the negative sign of Unemployment exerted on Entrepreneurship.



In the long run, Credit is not significant. We can conclude that the lack of granting of credit and/or the low access to credit during this period justify the non-significance of credit on Entrepreneurship (Housieaux and Villeneuve, 2010; Rachdi, 2006; Orser and Carrington, 2005; Amine and Staub, 2011).

*Table 5.6: Estimated short run Coefficient*

| Dependent Variable: Female entrepreneurship | | | | |
|---|---|---|---|---|
| Variables | Coefficient | Std. Error | t-Statistic | (Prob) |
| Credit | 0 .0208519 | 0.00258 | 8.08 | 0.000*** |
| Labor force | 0.0613825 | 0.0135175 | 4.54 | 0.000*** |
| Unemployment | 0.2195769 | 0.0306825 | 7.16 | 0.000*** |
| cons | -99.67001 | 0.6085828 | -163.77 | 0.000*** |
| ECM | -0.7112387 | 0.1932162 | -3.68 | 0.000*** |

Legend: * p<0.1; ** p<0.05; *** p<0.01

After examining the long-run association among entrepreneurship and its determinants we proceed to check the short-run dynamic within the error correction framework. Table 5.6 shows short run causality results. For the regression by entrepreneurship, the

calculated paramter of ECM has minus sign and significant at 1 percent. This error correction term is evidence of long-run cointegrating relationship running from Credit, Labor force and Unemployment to entrepreneurship.

In the short run, Credit is significant at 1 percent and positively associated with entrepreneurship. Indeed, access to credit promotes the development of entrepreneurship (Cohen, 2000).

The result of short run reveals that Labor force is significant at 1 percent and positively associated with entrepreneurship. This is evident because when the labor force grows and there is no possibility of jobs available to this working-age working population, there would be a terrible and strong influx towards entrepreneurship. Many will be excited to create a enterprise what justifies the positive effect of labor force on entrepreneurship.

The result of short run reveals also that Unemployment is significant at 1 percent and positively associated with entrepreneurship. This is also obvious because when Unemployment increases and there is no possibility of jobs available to this unemployed female population, there would be an increased desire towards entrepreneurship. Many unemployed women will be pushed towards entrepreneurship because it would be the only way out of unemployment, which justifies the positive effect of Unemployment on entrepreneurship.



Number of additional tests were applied and it does not show any evidence in opposition to the reliability of long-run regression equation. LM test for serial correlation could not reject the null of no serial correlation meaning error terms are normally distributed.

## *VIII- CONCLUSION AND POLICY IMPLICATION*

This paper analysed "assessing the effects of women empowerment, women employment and entrepreneurship in poverty alleviation in benin". We have three (03) specific objectives.

The first specific ojective is to analyze the effect of women empowerment in agriculture on household food Security Index in Benin. The result shows that women's empowerment index in agriculture is positively correlated with food security index. Thus, the likelihood of a household being food security increases when women's empowerment in agriculture increases. Women's agricultural empowerment increases the household food security index by 3.97 percentage points. In light of our results and in order to improve the level of household food security in Africa and more specifically in Benin, policy makers should promote and encourage the agricultural empowerment of women, especially in rural areas, through the establishment of communication systems with the intention of reducing gender inequalities in access to agricultural inputs, access to land and irrigation systems. Second, they must also implement institutional reforms favorables for women for the acquisition of land of large size. Finally, they must also encourage and promote women to education by reducing gender discrimination in access to education through formal government policies and increasing educational investment, supporting women to progress in education.



The second specific ojective is to analyze the effect of women's employment and entrepreneurship on Human Poverty Index in Benin. It is found that in the long run, only female entrepreneurship is significant and negatively associated with Human Poverty Index. The result of short run reveals that female employment is significant and negatively associated with Human Poverty Index. Similary, female entrepreneurship is significant and positively interconnected to Human Poverty Index. The reduction of poverty in the rank of women, leads us to recommend to political decision-makers following the results obtained: to implement policies favorable to the creation of sustainable and tenable women's small and medium-sized enterprises, to create public jobs through the implementation of policies favorable to the recruitment of competent women.

The third specific ojective is to analyze the effect of domestic credit on entrepreneurship women in the household in Benin. It is found that in the long run, Labor force and Unemployment are significant and negatively associated with Entrepreneurship. But in the long run, Credit is not significant. The result of short run reveals that Credit, Labor force and Unemployment are significant and positively associated with entrepreneurship. Improving and increasing the level of female entrepreneurship allows us to formulate, in the light of our results, the following policy

implications: increasing the granting of credit to women by limiting collateral barriers, favouring women in long-term lending policies, implementing policies favourable to women's business creation.

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## Table of Content