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GREEN

MICROFINANCE
& SUSTAINABLE
AGRICULTURE
IN SIERRA LEONE

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NEW PERSPECTIVES
AND SYNERGIC ACTIONS



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**GREEN MICROFINANCE
& SUSTAINABLE AGRICULTURE
IN SIERRA LEONE**



**NEW PERSPECTIVES
AND SYNERGIC ACTIONS**



SPANDA

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ACRONYMS



ADB	AFRICAN DEVELOPMENT BANK
ACDI/VOCA	AGRICULTURAL COOPERATIVE DEVELOPMENT INTERNATIONAL AND VOLUNTEERS IN OVERSEAS COOPERATIVE ASSISTANCE
AEDI	AFRICAN ECONOMIC DEVELOPMENT INSTITUTE
AEO	AFRICAN ECONOMIC OUTLOOK
AOG	ADDAX AND ORYX GROUP
APC	ALL PEOPLE'S CONGRESS PARTY
AU	AFRICAN UNION
BRAC	BANGLADESH RURAL ADVANCEMENT COMMITTEE
BID	BANK FOR INVESTMENT DEVELOPMENT
CDF	CIVIL DEFENSE FORCE
CAADP	COMPREHENSIVE AFRICAN AGRICULTURE DEVELOPMENT PROGRAMME
CGIAR	CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH
CIA	CENTRAL INTELLIGENCE AGENCY
CES	COASTAL AND ENVIRONMENTAL SERVICE
DEG	DEUTSCHE INVESTITIONS- UND ETWICKLUNGSGESSELLSCHAFT
ECOWAS	ECONOMIC COMMUNITY OF WEST AFRICAN STATES
EPA	ECONOMIC PARTNERSHIP AGREEMENT
EBID	ECOWAS BANK FOR INVESTMENT DEVELOPMENT
EDF	EUROPEAN DEVELOPMENT FUND
EEA	EUROPEAN ENVIRONMENT AGENCY
EPA	ENVIRONMENTAL PROTECTION AGENCY
ESHIA	ENVIRONMENTAL SOCIAL AND HEALTH IMPACT ASSESSMENT
FDI	FOREIGN DIRECT INVESTMENTS
FAO	FOOD AND AGRICULTURE ORGANIZATION
GAFSP	GLOBAL AGRICULTURE AND FOOD SECURITY PROGRAMME
GPA	GLOBAL PROGRAMME OF ACTION FOR THE PROTECTION OF THE MARINE ENVIRONMENT FROM LAND-BASED ACTIVITIES
GOSL	GOVERNMENT OF SIERRA LEONE
GDP	GROSS DOMESTIC PRODUCT
GNI	GROSS NATIONAL INCOME
HDI	HUMAN DEVELOPMENT INDEX
HDR	HUMAN DEVELOPMENT REPORT
IISD	INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT
IMF	INTERNATIONAL MONETARY FUND
INGO	INTERNATIONAL NON GOVERNMENTAL ORGANIZATION
FFW	KREDITANSTALT FÜR WIEDERAUFBAU
LRRD	LINKING RELIEF REHABILITATION AND DEVELOPMENT
MDGS	MILLENNIUM DEVELOPMENT GOALS
MEPP	MAKENI ETHNOL AND POWER PROJECT
MOU	MEMORANDUM OF UNDERSTANDING
MFI	MICROFINANCE INSTITUTION
MITAF	MICROFINANCE INVESTMENT AND TECHNICAL ASSISTANCE FACILITY
MIX	MICROFINANCE INFORMATION EXCHANGE
MAFFS	MINISTRY OF AGRICULTURE, FORESTRY AND FOOD SECURITY - SIERRA LEONE
NCSA	NATIONAL COMMISSION FOR SOCIAL ACTION - SIERRA LEONE
NSADP	NATIONAL SUSTAINABLE AGRICULTURE DEVELOPMENT PLAN
NBFI	NON-BANK FINANCIAL INSTITUTION
NGO	NON-GOVERNMENTAL ORGANIZATIONS
OSS	OPERATIONAL SELF-SUFFICIENCY
PCBS	POLYCHLORINATED BIPHENYLS
PAR	PORTFOLIO AT RISK
PRSP	POVERTY REDUCTION STRATEGY PAPER
ROSCA	ROTATING SAVINGS AND CREDIT ASSOCIATION
RPSDP	RURAL PRIVATE SECTOR DEVELOPMENT PROJECT
RUF	REVOLUTIONARY UNITED FRONT
SEVA	SELF EMPLOYED WOMEN'S ASSOCIATION
SLG	SIERRA LEONE GOVERNMENT
SLL	SIERRA LEONEAN LEONES
SAPA	SOCIAL ACTION AND POVERTY ALLEVIATION
SSA	SUB-SAHARAN AFRICA
SNAP	SUSTAINABLE NUTRITION AGRICULTURE PROGRAMME
TCP	TECHNICAL COOPERATION PROGRAMME
UN	UNITED NATIONS
UNCDF	UNITED NATIONS CAPITAL DEVELOPMENT FUND
UNIFEM	UNITED NATIONS DEVELOPMENT FUND FOR WOMEN
UNEP	UNITED NATIONS ENVIRONMENT PROGRAMME
UNDP	UNITED NATIONS DEVELOPMENT PROGRAMME
US	UNITED NATIONS WORLD FOOD PROGRAMME
UNWFP	UNITED STATES
WAAPP	WEST AFRICA AGRICULTURAL PRODUCTIVITY PROGRAM
WFP	WORLD FOOD PROGRAMME
WSPA	WORLD SOCIETY FOR THE PROTECTION OF ANIMALS







A VIBRANT AGRICULTURAL PRODUCTION HAS PROVED TO BE AN ANSWER TO ALLEVIATING RURAL POVERTY IN MANY COUNTRIES IN Asia and Latin America. However, in Africa agricultural sector has been stagnating for decades. While world agricultural production almost tripled between 1961 and 2007, agricultural production in Africa has performed worse than in Asia and Latin America (Pretty et al 2011). Compared with 39% in South Asia and 11% in Latin America and the Caribbean, Sub-Saharan Africa (SSA) has only 4% of arable and permanent cropland under irrigation (Kormawa 2011). Since the 1960's per capita food production in Asia rose by 102% and 63% in Latin America, whereas in Africa it rose in the 1960's, then fell in 1970's and only by 2000's has achieved the same level like in 1960's. The World Bank report (2008) shows that the value of agribusiness production in Thailand equals that of entire SSA and that of Brazil is four times the African in total. This, in light of agriculture accounting for 65% of full-time employment in Africa, 25-30 % of GDP and over half of total export earnings.

In Sierra Leone agriculture makes up 50.9% of overall GDP and employs more than 70% of the labour force, making it a main source of income for the country with 53.2% out of 6 million people living in severe poverty (UNDP, 2011; Spanda 2009). Developing rural areas is key to diminish poverty rates because the rural population comprises as much as 62% of the whole population. Furthermore, according to the Microfinance Demand Survey, for 55% of households agriculture is the most common source of income, and the figures are higher in the rural areas, with 74% of households living off agriculture alone (cf. NaCSA 2008). Since so many are dependent on agricultural production as their source of income, developing agriculture will solve food shortage and poverty issues. However, a lack of access to finance agricultural activities is preventing most of the rural dwellers from growing crops and making profit.

Sierra Leone has a relatively thriving informal microfinance sector with two financial mechanisms providing access to credit: Rotating savings, and credit associations (ROSCAs), locally called *osusu*. These have been prevalent ways to obtain credit but, due to the limited amount of income mobilized, the credit offered is not sufficient. In 2003, despite a high number of microfinance institutions (MFIs) serving around 13,000 active borrowers, the unmet demand for financial services was estimated to be between 76,000 and 145,000 borrowers in need of 20 to 40 million USD in loans (UNCDF report 2009). According to these figures, under the assistance of the Microfinance Investment and Technical Assistance Facility (MITAF) and as part of the "Development of a Sustainable Pro-Poor Financial Sector in Sierra Leone", donors, including UNDP, UNCDF, Cordaid and Kreditanstalt für Wiederaufbau (KfW) approved USD 13.4 million with 11.7 millions disbursed to support 13 MFIs providing loans to 120,000 borrowers. Upon the start up of the project in 2004, there was no real microfinance sector except of relief and development agencies, yet by 2009, under the MITAF project, 30 MFIs, commercial and community banks started their operations offering microloans. The downside of this project was an increasing saturation of urban microcredit markets. Out of 30 MFIs operating in the country, 23 are located in the urban centres, leaving the poorest layers of society in the rural areas financially underserved. The unmet demand for microloans in rural areas is caused by a confining character of the rural market, deriving from the lack of infrastructure constraining both borrowers and lenders (UNCDF 2009).

Diminishing poverty rates in the rural areas may also decrease the chances of intra-state wars and conflicts in a post-conflict country such as Sierra Leone, where the civil war (1991-2002) caused massive destruction and a widespread poverty. Despite a popular linkage of the prevalent youth participation in the war to the urban conditions, the "Survey of ex-Combatants in Sierra Leone, June-August 2003" by Humphreys and Weinstein (2004) proves that the majority of the Revolutionary United Front (RUF) rebels in the civil war came from the rural areas of the Eastern Province bordering Liberia. According to their survey involving a sample of 1,000 combatants, only 8% came from the Western Area and over half of the sample from the rural Eastern Province. Prior to the war, 35% of the combatants were school pupils and 27% were farmers. The RUF and the Civil Defense Force (CDF) selectively recruited fighters mainly from rural areas bordering Liberia, who were distinctly poor farmers and lacked any education, indicating that rural areas were the main source of fighters because of the wide spread rural poverty.

The fact that the majority of the population live in impoverished rural areas indicates that many Sierra Leoneans do not have access to urban jobs and are limited to occupations such as farming and kettle growing. The insufficient supply of financial services is one of the obstacles for the rural development, since the main source of income in rural areas is agricultural production that under sufficient supply of finance can thrive and provide the poor with food and cash. Lastly, developing the rural areas via fostering agricultural production may also be an answer to decreasing the chances of future conflicts in the country.

1.1 ~ CURRENT STATE OF AGRICULTURE

The total arable land for agricultural activities in Sierra Leone is 5,530,000 ha, 74.2 % of the total land area. Most of the land is owned by the state and by small-holder farmers. The arable land has increased substantially from 0.48 in 1999 to 1.09 million ha in 2009, while the availability of arable land and land with permanent crops per person for people dependent on agriculture has decreased since 2004, from 0.40 ha to 0.35 ha. The amount of arable land reached 1.13 mln. ha in 2004 from 0.48 ha in 1999, decreasing to 1.09 mln. ha in 2009. The annual growth rate of agricultural production per agricultural worker between years 2004- 2009 was 1.7% compared to a much higher annual growth rate of 4.9 % between the years 1999-2004. As a result, the annual growth rate of agricultural food production per capita has suffered a similar decrease within the same period: from 3.76% in 1999-2004 to 0.67% in 2004-2009 (FAO STAT 2011). These figures show that agricultural sector grew substantially right after the end of the civil war (2002) but has been stagnating in the recent years, which is one of the reasons the country was ranked 180 in the Human Development Index in 2011 (UNDP HDR 2011).

Data from the UNWFP “Sierra Leone Comprehensive Food Security and Vulnerability Analysis” (2010) indicates that the land accessibility alone is not enough for the provision of food security. Lack of access to financial services for purchasing agricultural inputs, such as seeds, fertilizers, pesticides, etc., serves as one of the reasons for a large proportion of land to remain uncultivated. The Agricultural Tracking Survey by UNWFP (2010) states that households having access to agricultural land were more likely to be food insecure than the ones not having access to any land. Out of 67% of households having access to agricultural land in the country overall, 89% are in rural areas and 28% in the urban areas. The survey indicates that 52% of households having access to land were food insecure, whereas only 31% of those not having access to land were food insecure. This can be explained by the fact that 56% of those, who did have access to land kept at least a part of their land uncultivated. The main reason for this shortcoming is a lack of agricultural inputs and labour in rural communities. Furthermore, the agricultural sector lacks efficient mechanization. These figures might also explain why, despite being rice cultivators themselves, 28% of households are also net buyers of rice. They relied on their own rice production only during 3.7 months and the rest 8.4 months they were forced to purchase it. The FAO data demonstrates that the import of the rice milled comprises the largest share of all imported products of total import quantity of 145,041 tones and constitutes 898 kkal consumed per capita a day (FAO STAT, 2011). Fostering rice production, thus, could be a profitable business since a tropical climate is conducive for rice cultivation and if grown locally, it could become less costly and more available to the rural poor.

1.2 ~ CURRENT MICROFINANCE SITUATION AND FOREIGN CONTRIBUTION TO MF DEVELOPMENT

Since the end of the civil war (2002) to jump-start the economy, the government has implemented many development policies and programmes in the agricultural sector, a driving force making up 50% of the total GDP (SPANDA 2009). In 2003, to provide the poor with access to financial services, the government implemented the National Microfinance Policy, which supported growth of private sector participation in the provision of microfinance services and created a conducive legal and regulatory framework for the sector to flourish, while still remaining under government supervision. This first significant step toward alleviating poverty after the war focused on establishing market-oriented financial and credit policy, following the previously state-owned and subsidized credit policy.

An important government action to decrease the rural poverty rates was the National Commission for Social Action (NaCSA) that operates the Social Action and Poverty Alleviation (SAPA) micro credit programme, targeting the rural communities, women and various Community Based Organizations. As of 2003, SAPA was the biggest programme implemented by the African Development Bank (ADB) and was working with 41 local NGOs, which collaborated with 114 Community Based Organizations providing service to 6,500 people. For the period of 2010 to 2030 the government is committed to the Comprehensive Africa Agriculture Development Programme (CAADP) through the National Sustainable Agriculture Development Plan (NSADP) that recognizes the necessity of rural safety nets to enhance social protection and support agricultural commercialization. In June 2010, as a way of supporting the government’s objectives to foster agricultural sector to stimulate the overall economy, the Global Agriculture and Food Security Programme (GAFSP) granted the government USD 50 millions for its “Small-Holder Commercialization Programme” (FAO, 2011). The GAFSP programme also created a longer-term response centered on crop production, processing and marketing food security programme “Operation Feed the Nation”. FAO contributed USD 500,000 through its Technical Cooperation Programme (TCP) to get the national agriculture response programme off the ground.

As part of the agricultural development plan and support for the implementation of the Economic Partnership Agreement (EPA) under the 10th European Development Fund (EDF), the European Commission offered €268.4 million to build infrastructure, sound institutional framework, and contribute to pro-poor sustainable growth including alleviating food insecurity and unemployment. From 2003 to 2007, EDF has granted €25 million under the Linking

Relief Rehabilitation and Development (LRRD) projects (European Commission, 2012). However, despite this international assistance and an improvement in agricultural sector productivity, in 2010 45% of the population was food insecure due to a lack of financial services in the rural communities (UNWFP 2010).

1.3 ~ LACK OF RURAL MICROFINANCE

Since MFIs are discouraged to reach out to the villages because of the complexities of rural and agricultural microfinance, rural dwellers are often financially underserved. In 2010, a study (Morvant-Roux 2008) on rural finance among the member countries of the West African Economic and Monetary Union found that only 14% of all supplied credit goes to the agricultural sector. Interestingly, 92% of this credit came from the commercial sector, surpassing that of microfinance institutions – 3% and development banks – 5%.

The reluctance of MFIs to operate in rural areas can be explained with several obstacles they encounter in the process. The first, according to world rural microfinance practice, is the deficiency of infrastructure in rural areas, which also increases transaction costs for both borrowers and lenders. In Africa in general, geographic dispersion combined with rural areas of low-population density makes it easier for MFIs to operate in urban areas instead. Second, even though the demand for rural microfinance is especially vital in rural areas, there is a lack of absorptive capacity because of the low literacy rates among the rural population. The rate of rural people using MFI services increases with the level of their education and financial literacy. Sixty five % of respondents in the survey completed by DFC and Statistics Sierra Leone in rural areas are illiterate, compared to 36% in urban areas, as a result, out of 13% of all savers, 24% are from urban areas and only 8% live in villages (NaCSA 2008). Many MFI service providers complain because running a location in the rural areas satisfies a small number of qualified clients, since some cannot meet documentation requirements and some do not have appropriate knowledge on finance and crop production.

Third, weather uncertainties increase MFIs' risks in rural areas because of uncertain harvest profits that decrease the rates of repayment. The unpredictable weather conditions linked to climate change and environmental degradation can affect the crop production because of seasonal droughts, heat waves, changed rainfall patterns, landslides, thunderstorms and higher temperatures. Notwithstanding this, agricultural production is a possible way out of undernourishment and it is vital to evaluate the impact of microfinance on agriculture as a way of developing local communities.

It is crucial to emphasize that rural microfinance and agricultural sector are mutually reinforcing paradigms as the sustainability of the latter is directly dependent on the sustainability of the former. One of the first requirements for microfinance sustainability in rural areas is the repayment rate. For MFIs to ensure high rates of repayment, it is vital to encourage farmers and perhaps make it compulsory to diversify their crop production. In their turn, MFIs should also diversify their services by providing microloans both to agricultural and non-agricultural activities. As agricultural activities are high-risk investment because of low repayment rates, MFIs choose to halt operations in rural areas. To avoid such cases, it is important for them to operate in urban areas as well, because in case of temporary low rates of return in rural areas due to poor harvests or weather-caused low output production, MFIs do not run losses.

1.4 ~ IMPACT OF MICROFINANCE ON AGRICULTURAL SECTOR

Several economic benefits can follow as a result of rural microfinance. The income of MFI clients can be increased leading to several secondary benefits: changes in quantity, consumption, and timing of consumption, savings, and asset-holdings. Also, diversification of income occurs among the rural poor, which is important for agriculture production as it is dependent on weather fluctuations and crop cycles. Access to microloans may contribute to diversification of farm activities and give rural poor a possibility to purchase a variety of crop seeds, to maximize their profitability in case if one crop does not yield any outputs.

A slight increase in income as a result of microloans allows the poor to spend their income on immediately necessary goods, such as shelter, improved nutrition and basic goods, which may substantially improve the standard of living for impoverished communities. One of the main advantages of microloans is crop production effects. By borrowing microloans, the poor are able to purchase crop seeds allowing them to expand their subsistence production into small agricultural enterprise creating job opportunities for local people. For instance, Bangladesh Rural Advancement Committee (BRAC), a development organization providing microfinance to rural populations in Sierra Leone since 2008, addresses the issue of low crop and livestock productivity by striving to maximize agricultural outputs, decrease livestock disease rate, and increase rural employment rates. In 2009, BRAC incorporated its MicroFinance Limited programme disbursing its first loans in June of same year (BRAC report 2010). The organization disbursed microloans to 13,000 women ages 18 to 50 with no education and to those women who were not served by other microfinance institutions to ensure that disadvantaged people are not left out. This way all layers of population are covered.

The most common farming activities are raising chickens, sheep, goats, pigs or cows and cultivating small plots of land of less than three acres. Nevertheless, the agricultural productivity is constrained by low yielding outputs, livestock disease and declining soil fertility. Lack of education in crop cultivation and livestock diseases also hampers profitable outputs. Often rural people cannot grow livestock because they have no access to or cannot afford purchasing vaccinations. This is where microfinance can substantially improve the picture. By taking out as small of an amount as USD 100-300, farmers can purchase seeds, fertilizers and pesticides and maximize their outputs by learning about efficient land usage and farming technologies from certified staff of MFIs. Using microloans will enable them to purchase vaccinations, de-worming and various other treatments that are required for livestock support, which will diversify sources of income for borrowers thereby making them less dependent on a single production, such as crop cultivation, as it can be highly unreliable because of low soil fertility and weather conditions. Diversification of sources of income by farmers will attract more MFI into the rural sector for MFIs are reluctant to operate in rural areas due to high risk involved. This should increase the rate of repayment as the borrowers will have an alternative source of income, turning into a mutually beneficial situation as rural microfinance success is directly correlated to agricultural success in the rural areas.

Besides providing microloans, MFIs can and often do offer training and technical assistance to its members teaching them to make the most out of their existing activities. Their training staff is qualified to teach locals efficient crop growing techniques, livestock and poultry rearing, high yield seed varieties and related technologies. Training borrowers as an addition to microloans can ensure that the money the locals take out does not get spent inefficiently by those who have little experience with farming.

From the example of BRAC operation in Sierra Leone, one can see not only how rural microfinance can provide rural communities with subsistence farming and thus food security, but also provide an opportunity to establish a small-enterprise selling agricultural produce. Without access to loans these farmers would not be able to sell their produce, as the amount they would grow would not be sufficient for trade. Also, as small enterprises grow in size they can create employment in the local communities. BRAC's small enterprise loans range in amount from USD 1,000 to USD 3,000. According to their report (BRAC report 2010), the most popular loan uses are: selling dried/smoked fish; running a restaurant; selling palm oil, charcoal, rice; hairdressing business; selling kitchenware, soft drinks/water, seasonal fruits, and chips. These activities indicate that microloans cannot only provide the poor with subsistence level crop production but also with cash crop production opportunities.

One of the obstacles for establishing agricultural small enterprises is the absence of storage facilities and agro-processing. If not transported and exported quickly many crops may get spoiled causing losses in profits. Often due to the absence of such facilities, small enterprise owners are forced to sell their produce right after the harvest, when the prices are very low, and having access to storage facilities, such as dry floor facilities, would enable them to store their crops until the prices increase and sell their produce at a higher market price thereby covering their microloan and making profit as well. Expanding into non-farm activities such as agroprocessing, food distribution, small scale manufacturing, equipment repair and rental are also possible advantages of microfinance. Expanding enterprises will create more jobs in the area, leading to overall local economic development and solve the food scarcity issue.

Another important benefit of microfinance is savings and first of all access to savings. Many poor do not save because of lack of sustainable income or simply for not having a safe place where to keep their savings for formal banks are located in more densely populated or urban areas. MFIs allow the poor to save either through mandatory savings or through diversification of income. Saving can smooth consumption and invest in earning activities or prepare for emergencies. Some households cannot afford any health care because they lack savings, which may lead to deaths from easily preventable diseases especially among young children who tend to get infected through contaminated waters.

Fostering agricultural production among the rural population is a feasible and effective way out of poverty and food insecurity. However, with the country's lagging agricultural sector and a lack of rural microfinance, current agricultural production level has proven insufficient to provide food and alleviate poverty. While with an adequate provision of rural microfinance and conducive regulatory microfinance policy, agricultural sector can flourish.

1.5 - LAND GRAB AND ITS IMPACT ON AGRICULTURE

Besides a lack of microfinance hindering crop production in the most impoverished rural areas, a growing number of land deals are also posing a threat to local food security in Sierra Leone. Agriculture is the biggest source of income for the rural poor and confiscation of land deprives them of their main source of subsistence food and potential income. However, with the growing world population, climate change, increasing search of alternative energy solutions and sky-rocketing food insecurity, the world has been witnessing an alarming growth in 'land grabbing' in the developing world, especially in Africa.

The term *land grabbing* refers to leasing or purchasing of vast territories of land by other nations and/or private investors from poor, usually impoverished countries to grow crops for export. According to Global Land Project, as of 2010 approximately between 51 and 63 million ha were assigned as land deals or being negotiated in 27 host countries in

Africa (cf. Friis and Reenberg 2010). One of the determining factors of land grabbing is a growing demand for land caused by a steadily increasing world population. From 1987 to 2007 the world population has increased by 34% while the average amount of land per person declined from 7.9 ha to 2 ha in 2005 (Friis and Reenberg 2010). By 2050, the world population will reach 9.2 billion people, meaning that the amount of land per person will drop even further. Shrinking amount of land per person in combination with soil degradation and climate change increases the chances of food insecurity for the whole world but especially for countries with large populations and/or limited amounts of arable land. Changing rain patterns caused by climate change can render previously fertile land useless for cultivation, as in China where desertification left a high number of farmers with no land to grow food crops, making China one of the countries with the highest demand for land grabbing in the world.

Another indirect trigger of land grabbing is the growing concern for greenhouse gases and consequently an increasing need of green energy, which leads to grabbed land being used for biofuel production. High oil prices in 2007 and 2008 have also created incentives to seek alternative energy sources. As a result, foreign investors and rich countries are more prone to purchase or lease large territories of land in less developed countries that seek to gain profit from such ventures.

Due to a wide misperception that Africa has unused vacant land, the continent has the highest amount of its land leased or sold to foreign investors and food insecure and oil rich states, like China, the Gulf states and some European countries (Italy, UK, Denmark, France). It is estimated that around 80% of the global reserves of farmland is located in Africa and South America (Cotula et al 2009). However, despite such a high figure, most of these areas are either covered with rainforest or are already used for cultivation or for grazing of animals. The host countries are often poor countries seeking to attract investors and in the hope that land deals will provide them with funds to develop agriculture and infrastructure. Supporters of land deals provide this argument claiming that the practice will profit the people in a long term and create employment opportunities in rural areas. On the other hand, the opponents criticize these deals because some agreements contain clauses granting investors full export rights of the production, thus potentially aggravating local food insecurity problem. Such land deals have a significant impact on land systems and food production in especially food-insecure country as Sierra Leone. The country is not an exception to the growing trend in land deals in Africa, even though the biggest recipients or 'host' countries on the continent have been Ethiopia, Madagascar, and Sudan.

The Government of Sierra Leone (GoSL) fully supports land deals by claiming that foreign investments can help the country to develop. It argues that only 12 to 15 % of the country's land is being cultivated, leaving a large area 'unused' thus available for foreign investors (Oakland Institute 2011). This support is part of the current government's policy of National Sustainable Agricultural Development Plan (NSDAP) passed in 2009, which aims to jump start agricultural production through the commercialization and private sector participation. The current government believes that foreign investment will provide necessary funds in order to transform small holder farms into larger and more mechanized farms. In 2010, to attract investors the government received a delegation of investors from China, who were invited to visit the country's palm oil plantations, rice fields, and a rubber plantation. The authorities also created high incentives and simplified foreign investment by offering tax breaks and customs duty exemptions to large-scale agricultural investors. Under these schemes investors receive a 10 years corporate tax holidays on investments in tree-crops (including palm oil), rice and timber. In 2010, investors also benefited from zero import duty, while being allowed a 100% foreign ownership in all sectors.

According to the Oakland Institute report (2011), by early 2011 around 500,000 ha of farmland had been leased on the territory of Sierra Leone. Most of the deals are recent with most of them signed after 2007. As of 2010, four major land deals have been documented: Addax Bioenergy (Switzerland), Quifel Agribusiness (SL) Ltd. (subsidiary of Quifel Natural Resources, Portugal, 120,000 ha), Sierra Leone Agriculture (subsidiary CAPARO Renewable Agricultural Developments, UK, 43,000 ha), and Sepahan Afrique (Iran, 10,117 ha) (on hold or cancelled).

The Deutsche Investitions und Entwicklungsgesellschaft (DEG) funded an ethanol project by Addax Bioenergy company (a subsidiary of the Addax & Oryx Group with headquarters in Geneva). In June 2011, the company signed a €258 million land deal to develop a renewable energy project and leased 20,000 ha of land nearby the town of Makeni in the extremely poor northern region of the country (Oakland Institute 2011). The project is to produce 90,000 m³ of ethanol per annum for export to the European Union market and 32MW of nominal electrical power capacity.

According to the proponents of the Addax Bioenergy project and the government itself, the project will offer several benefits to the society. GoSL states that the project is aligned with the country's investment programme and will provide job opportunities for people of all skill levels (African Development Bank Group 2010). According to the same source, only 77 people will be forced to relocate due to the land lease. A report by African Development Bank Group (2010) also argues that the legal framework is on the side of the landowners and under customary land tenure, the ownership of land is vested within chiefdoms and communities implying that the land deal is not posing a threat to their land rights.

However, whereas microfinance sector has been regulated and a clearly defined National Microfinance Policy was created in 2003, there is no strong regulatory framework regarding land deals. The regulatory framework is weak and leaves local farmers vulnerable to coercion by foreign investors. In 2009, the Ministry of Agriculture, Forestry and

Food Security (MAFFS), responsible for the agricultural production and investment in the sector, passed “Investment policies and incentives for private sector promotion in agriculture in Sierra Leone” (MAFFS 2009). Despite the existing guideline stating that “the investor will pay USD 5 per acre (USD 12 per ha) per year for any lease agreement”, several foreign investors have been paying less than the aforementioned amount. For instance, Sierra Leone Agriculture pays only USD 2 per ha per year and Quifel Agribusiness will pay USD 5 per ha per year in the first year, increasing the amount to USD 8 per ha per year in the fourth year, keeping it at that price for the rest of the lease agreement of 49 years (Oakland Institute 2009). Clearly, there are loopholes in the policy framework and lack of government regulation of the foreign agricultural investments.

In addition, most inhabitants in the rural areas are not educated and have no knowledge of their legal rights on the land. Under the Provinces Land Act of 1961, based on the Protectorate Ordinance of 1927 and the Tribal Authorities Ordinance of 1938, land is the property of indigenous land-owning families. The custodians of the land are Paramount Chiefs and the Chiefdom Councils, who hold land for and on behalf of the community. The land is inherited from generation to generation and the Law does not allow non-natives (Krios), foreigners, foreign companies and missionary churches to lease land for longer than 50 years. If not for the government’s intention to reform the land laws making land deals more attractive for investors, these Ordinances would be beneficial for the local population. In 2010, Sierra Leone’s Law reform Commission has begun working on the policy reform, which aims to reduce the number of actors involved in land negotiations to ensure security of the land deals. Civil society organizations argue that such a reform will hurt, first of all, women, who could be displaced from the land, to which they have no title to and would receive no compensation for the land leases (Oakland Institute 2011). Displacing women and not compensating them would greatly harm children from rural areas, since women tend to be caring for the family on their own. This will also leave rural MFIs with no clients because the main client base in the villages is women and no access to micro-finance will aggravate poverty in the areas as well.

The government is claiming that there is 5.4 million ha of cultivable land, of which 90 % is available, and further that 4 million ha of rich cultivable land is not being ‘used’. Nevertheless, an independent research (Oakland Institute 2011) on land grabbing in Sierra Leone has indicated that the last research on arable land, land use and vegetation is outdated or nonexistent. The research points out that the figures cited by the government regarding the amount of available land are from a survey conducted in 1979 by UNDP/FAO. Since that time, large-scale deforestation took place altering the figures substantially. In addition, the same source indicates that the report written in 1975 by FAO has been used by the Gosl for policy and decision making. Due to the fact that population has substantially increased since 1975 and soil degradation together with climate change took place, it is clear that the amount of land available has altered and the research conducted in 1975 is no longer credible, nor accurate. Therefore, there is less land available per person now than in 1975, and there is more people deprived of their land for food crop production than there would be in 1975. Agriculture and subsistence farming are the main sources of food for rural inhabitants with no access to markets because of the geographical remoteness of villages and absence of adequate infrastructure. The WFP survey indicates that 22% of villages represented were located 24 km away from the food markets, and 6% were 48 km away from the nearest market, meaning that if people have no land to grow crops they will have no way of buying their food from the market, even if they do have financial means to do so (cf. Oakland Institute 2011).

Furthermore, Addax Bioenergy will be cultivating ethanol and sugarcane and not food crops, which undermines the local food supply, because the amount of imported food will have to be increased in order to meet the demand for food. According to FAO report on food insecurity (2011a) international food prices are prone to fluctuate and increase and chances that the poor rural people will not be able to afford the imported food products are high. Therefore, despite the number of people the company promises to employ-3,000, the risk of food insecurity in the future is alarming (Oakland Institute 2011).

Addax Bioenergy claims that the ethanol plantations are designed to omit the rice paddies, which will allow local population to farm on them, but the Environmental Social and Health Impact Assessment (ESHIA) states that Addax will use a large part of the land previously cultivated with staple foods like rice and cassava, bearing a heavy negative impact on the local food production and people’s every day subsistence food. Despite such warnings, the central government has been engaging in building a bridge between the locals and the Addax Bioenergy by fully promoting the agenda of the latter.

Addax Bioenergy has also failed to fulfil its own promise of providing 2,000 ‘direct jobs’ (Oakland Institute 2011). By the end of 2010, the project has hired only 200 people as casual labourers, leaving most people with no land and no jobs. Some work operations are carried out by international companies, such as Agricare, a South African contractor, which bring in their own expatriates to run the nursery and construction work, taking away potential jobs from the locals.

The project will also degrade local supply of water as it requires large quantities of local water resources to grow sugarcane. The Memorandum of Understanding (MOU) between the government and Addax Bioenergy, signed in February 2010, states that Addax will pay the amount of 3 Leones (0.007 US cents) per cubic meter of water drawn from the Rokel River, without specifying the exact amount of water the project will require (MOU 2010). The ESHIA responded to this by

arguing that “the cumulative impacts of the project on the Seli/Rokel River could result in very high impacts if unmitigated” (CES 2009). Thus, in addition to have the land being taken from the farmers living near by the project location, the farmers located further away might experience harvest shortage that can occur as a consequence of water shortage in the area.

One, there is a lack of rural microfinance in Sierra Leone due to a high risk involved for MFI to operate with agricultural production. Two, as a result, rural dwellers do not have money to purchase agricultural inputs to grow food and cash crops, leading to stagnation in a potentially viable agricultural sector. More microfinance provided to the rural poor can translate into a growth in agricultural sector equalling in diminished poverty rates.. Provision of microloans to individuals can empower and create a sense of responsibility for the money borrowed, therefore creating higher incentives for an individual to grow crops and attend agriculture training workshops offered by MFIs. Offering mandatory training workshops is also a long term investment in the area as it improves human capital increasing the level of technical knowledge of the people enabling them to grow crops without supervision in the future. Microfinance institutions can, therefore, have a positive impact various aspects of people’s lives. Three, Sierra Leone was not omitted by the growing trend of land-grabbing resulting in several government-supported successful land deals with foreign investors. These deals take away the only source of income of rural populations leaving them even more impoverished than ever before. If such government policies of unconditionally supporting land deals continue, food insecurity and poverty levels in the country will increase substantially.

A combination of a lack of microfinance and growing number of land deals has a heavy negative impact on rural poverty and these two issues remain two main obstacles for the improvement in agriculture. International community should take action toward fostering provision of microfinance services to the rural poor while convincing the government not to agree to land deals, which leave so many without any sources of subsistence.

REFERENCES

- AFRICAN DEVELOPMENT BANK GROUP. (2010). Addax Bioenergy Project: Sierra Leone: Executive Summary of the Environmental, Social and Health Impact Assessment.
- EUROPEAN COMMISSION: DEVELOPMENT AND COOPERATION-EUROPEAID. “Sierra Leone”. <http://ec.europa.eu/europeaid/where/acp/country-cooperation/sierra-leone/sierraleone_en.htm> [retrieved February 2012].
- BRAC. (2010). *Sierra Leone Annual Report*. <<http://www.brac.net/content/where-we-work-sierra-leone-microfinance>> [retrieved February 2012].
- COASTAL AND ENVIRONMENTAL SERVICES (CES). (2009). “Sugarcane to ethanol project, Sierra Leone, Draft ESHIA”.
- FOOD AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO). “Country Brief: Sierra Leone”, 27 July 2011 [retrieved February 2012].
- CONTEH, B. & BRAIMA, S. (2004). *Microfinance and Informal Sector Development for Poverty Alleviation*.
- COTULA, L., VERMEULEN S., LEONARD, R., & KEELEY J. (2009). *Land grab or development opportunity. Agricultural investment and international land deals in Africa* (London-Rome: IIED, FAO & IFAD).
- DANIEL, S. & MITTAL, A. (2011). “Understanding Land Investment Deals in Africa. Country Report: Sierra Leone” (Oakland, CA: The Oakland Institute).
- FAO. (2011). “FAO Statistics: Sierra Leone.” <<http://faostat.fao.org/site/339/default.aspx>> [retrieved February 2012].
- . (2011a). “The State of Food Insecurity in the World: How does international price volatility affect domestic economies and food security?” (Rome: FAO).
- FRIIS, C. & REENBERG, A. (2010). “Land Grab in Africa: Emerging land system drivers in a teleconnected world”. GLP Report No. 1. GLP-IPO, Copenhagen.
- FARM LAND GRAB. (2011). “Sierra Leone opposition urges scrapping of land deals”. <<http://farmlandgrab.org/post/view/19175>> [retrieved February 2011].
- GOVERNMENT OF THE REPUBLIC OF SIERRA LEONE AND UNITED NATIONS CAPITAL DEVELOPMENT FUND. (2004-2009). *Development of a Sustainable Pro-Poor Financial Sector in Sierra Leone*.
- GOVERNMENT OF SIERRA LEONE. (2003). *National Micro-finance Policy: The Hope for the Poor*.
- HUMPHREYS, M. & WEINSTEIN, J. (2004). “What the Fighters Say: A Survey of ex-Combatants in Sierra Leone, June-August 2003”. Center on Globalization and Sustainable Development (New York: Columbia Univ.): 14-27.
- KORMAWA, P. (2011). “Agribusiness: Africa’s way out of poverty”. *Making It: Industry for Development* (2nd ed): 18.
- MINISTRY OF AGRICULTURE, FORESTRY AND FOOD SECURITY (MAFFS). (2009). “Investment policies and incentives for private sector promotion in agriculture in Sierra Leone”.
- MEMORANDUM OF UNDERSTANDING (MOU) AND AGREEMENT BETWEEN THE GOVERNMENT OF THE REPUBLIC OF SIERRA LEONE AND ADDAX BIOENERGY SIERRA LEONE LTD. And Addax & Oryx Holdings BV. (2010).
- MORVANT-ROUX, S. (2007). “What Can Microfinance Contribute to Agriculture in developing Countries?” FARM. Proceedings from the International Conference, Paris, 4-6 December, 2007.
- NATIONAL COMMISSION FOR SOCIAL ACTION. (2008). *Study of Microfinance Sector Capacity Building in Sierra Leone*.

- PRETTY, P., TOULMIN, T., & WILLIAMS, S. (2011) "Sustainable intensification in African agriculture", *International Journal of Agricultural Sustainability*, 9(11): 5-24.
- RAMANKUTTY, N., FOLEY, J.A., & OLEJNICZAK, N.J. (2002). "People on the land: Changes in global population and croplands during the 20th century". *Ambio*, 31(3):251-257.
- RETTET DEN REGENWALD (Rainforest Rescue). (2010) "Completed Campaigns: Sierra Leone: European ethanol project to cause more hunger in Sierra Leone". <<https://www.rainforest-rescue.org/mailalert/523/sierra-leone-european-ethanol-project-to-cause-more-hunger-in-sierra-leone>> [retrieved February 2012].
- RICHARDS, P. (2005). "To fight or to farm? Agrarian Dimensions of the Mano River conflicts (Liberia and Sierra Leone)". *African Affairs*, 104 (417):571-590.
- SPANDA FOUNDATION. (2009). *Moving On: Sierra Leone Report* (The Hague: Spanda Publishing).
- SIERRA LEONE - EUROPEAN COMMUNITY. (2003-2007). *Country Strategy Paper and National Indicative Programme*.
- UNITED NATIONS CAPITAL DEVELOPMENT FUND. (2009). *Final Evaluation: Development of a Sustainable Pro-Poor Financial Sector in Sierra Leone*.
- THE OAKLAND INSTITUTE. (2011). "Understanding Land Investment Deals in Africa. Country Report: Sierra Leone" (Oakland, CA: The Oakland Institute).
- THE WORLD BANK. (2008). *World Development Report: Agriculture for Development*.
- UNITED NATIONS DEVELOPMENT PROGRAMME. (2011). *Human Development Report: Sustainability and Equity: A Better Future for All* (New York).
- UNITED NATIONS WORLD FOOD PROGRAMME. (2010). *Sierra Leone Comprehensive Food Security and Vulnerability Analysis (CFSVA) 2010:9-74*.



2 ~ GIRLS MEAN BUSINESS :
CAN PERFORMANCE MICROFINANCE INSTITUTIONS BE
ENHANCED BY FEMAL PARTICIPATION?
A PANEL-DATA STUDY FOR ECOWAS (2005-2009)²



M

2.1 ~ INTRODUCTION

MICROFINANCE IS AIMED AT IMPROVING THE ACCESS TO LOANS AND SAVINGS FOR THE POOR (SHREINER, 2001). THE BEGINNING of the new decade has provided an empirical argument that the “revolutionary thinking of microcredit” has not yet improved the living conditions of the poorest of the World to the expected magnitude. Recent academic studies raise doubts about the effectiveness of microcredit schemes. There now exists empirical evidence that various poverty alleviation programs and microfinance schemes, although being successfully implemented, did not achieve their goals in such problematic areas such as rural Nigeria (Audu, Achegbulu, 2011), Ghana (Kotir, Obeng-Odoom, 2009) or Uganda (Lakwo, de Haan, 2010).

Institutions are facing the crucial question nowadays – how can the mission of poverty alleviation be accomplished along with meeting the essential financial sustainability thresholds. There exists a popular belief that targeting women can lead to the improvement of financial performance. Recent academic literature supported by the anecdotal evidence suggests that women tend to be more reliable clients for the microcredit institutions in terms of repayment (Dobra, 2009; D’Espallier *et al*, 2011).

The aim of this paper is to address the issue of female participation in microfinance activities and its impact on institutional performance. To meet this goal, the study uses data on 180 MFIs based in 14 countries in West Africa for the years 2005-2009 to investigate empirically how the female participation ratio affects the repayment rate. To obtain a realistic and precise picture, besides the percentage of female borrowers, variables control for the experience of the institution, outreach level, size etc.

The study investigates microfinance in the Economic Community of West African States (ECOWAS), as this set of countries is considered to be representative for the Sub-Saharan region. The Economic Community of West African Countries was established in 1975 and has initially included 16 countries, with Mauritania leaving the union in 2001. According to ECOWAS Bank for Investment Development (EBID) the member states cover 17% of the continent surface and 35% of the region’s population, forming the most populated economic community in Sub-Saharan Africa (The World Bank, 2011). ECOWAS declares its main goal which is to form the unitary economic space, establish the common currency and liquidate any capital and labor barriers.

Since 1981 the number of poor (those, who live on less than \$1.25 a day) in Sub-Saharan Africa has nearly doubled in absolute terms and is represented by close to 50% of the population in the region (The World Bank, 2012). According to Dimandja (2004) with the reference to the IMF nowadays the poorest person in the World is a woman, who lives in Sub-Saharan Africa. The female population in the region is strongly underprivileged due to the scope of cultural, educational and economic constraints.

Current research contributes to the field of MFI performance by empirically verifying the positive impact of female inclusion on repayment rates for the West African region via focusing on a specific dataset (ECOWAS countries) and using the set of controls, which have not been brought together in the empirical research before. Moreover, this study is based on three different dependent variables (portfolio at risk > 30 days, portfolio at risk > 90 days and write-off ratio), which reflect the delinquency cycle of the credit – from the very first threshold of deferred payments to the defaulted loans.

Actual research on the linkages between female inclusion and financial performance is built around the hypothesis that women are better customers for microfinance institutions in terms of repayment reliability. The empirical investigation of the dataset on the 14 ECOWAS countries provides the finding that, indeed, for this particular set of MFIs the increase of female involvement in financial activities improves the repayment performance.

Moreover, the research investigates which particular factors allow MFIs to benefit more from female inclusion. For these purposes two procedures are implemented. Firstly, the dataset is divided into several groups according to the institutional features and running regressions including a set of controls. Secondly, the interaction terms are included in the initial equation. Data analysis shows that the magnitude of the impact varies for the institutions with different characteristics: MFIs concentrating their activities in rural areas benefit more from female inclusion, and so do those with lower outreach levels. However, any difference in terms of an institution’s experience or size has not yet been found.

The current study is structured in the following way: Section II brings together the arguments in favour of the inclusion of women in microfinance, Section III discusses the existing evidence on correlation between gender composition and

repayments. Section IV determines the hypotheses to be tested, following Section V describes the dataset. Section VI represents the methodological framework. Section VII reports the estimation outcomes and discusses the intuition behind the coefficients and, finally, the study's conclusions, implications and limitations are presented in Section VIII.

2.2 ~ RELATION BETWEEN WOMEN AND MICROFINANCE

The problem of female inclusion in microcredit schemes captured a lot of attention in the academic world because of the belief that women-dominated gender composition is capable of meeting several concerns simultaneously – by including women an institution improves its financial performance and, at the same time, contributes to female empowerment and poverty eradication.

To justify the importance of gender composition, it is essential to draw the distinction between the credit provided to female and male borrowers. It is really important to clarify the specific features of loans to low-income women in the developing regions. Credit provided to women in these regions is characterized by small amounts and, hence, relatively high interest rates and monitoring and transaction costs (Nawaz, 2010).

Cheston and Kuhn (2002) argue that the average loan size for women borrowers is much lower due to the overall lower income levels among women and the presence of the gender bias, which the community imposes on the scope of the income-generating activities. In general, credit services for women are commonly characterized by group lending, where no material collateral is provided, instead of that, institutions rely heavily on self-monitoring and cooperation among borrowers.

The existing literature on the issue provides the reasoning why female participation should be taken into close consideration by MFIs. Mayoux (2005) highlights the three most relevant approaches, through which the necessity of the introduction of women to the microcredit services can be justified. She refers to the concepts as “paradigms” and gives an answer to the question “Why microfinance should target women?” This section of the current paper describes in detail the arguments, which they provide in favour of female inclusion in microfinance schemes.

2.2.1 ~ GENDER EQUALITY

Mayoux emphasizes the feminist empowerment paradigm. Microfinance institutions, which put gender equality on the first place in their mission statements, are focusing solely on women in order to reach their ideological goals. According to Dobra (2009), women are not only the poorest individuals in the developing communities, but also the most vulnerable ones in terms of access to the social and economic activities. In some societies women have been historically excluded from the income-generating activities. Due to the lack of entrepreneurial opportunities, women have never developed essential commercial skills, such as negotiating, marketing, basic profit-maximization knowledge (e.g. awareness about currency fluctuations) and decision-making (Mayoux and Hartl, 2009).

Mayoux claims that the blame for the economic exclusion lies not only on the presence of the gender biases, but also the market underdevelopment – the services, provided by institutions, are not always tailored in women's favour. For instance, for some microfinance programs women still need their husband's signature, but there exist no services, which a man can enjoy only with his spouse's agreement, other way round, he can use his wife's property as collateral. The difference in the lending conditions serves as the bright illustration on gender discrimination even within microfinance programs.

The issue of female empowerment is of great importance due to its impact on overall development levels. Cheston and Kuhn (2002) claim that the presence of severe gender inequality is halting the economic development. Similarly, the UN report (2009) emphasizes the strong positive correlation between gender empowerment and the Human Development Index. In order to improve the social performance of microcredit institutions, the Microfinance Summit Campaign (2009) prioritises promotion of microfinance “among the poorest families, especially women”. Targeted women should get more entrepreneurial opportunities and increase their social status within the communities.

Empowerment in the feminist context assumes transformation and evolution of power relations throughout the society – in the community, where women are initially excluded from the economic activities and lack the decision-making power, microfinance is believed to shift the balance towards women's economic, social and political inclusion.

2.2.2 ~ POVERTY ALLEVIATION

The second approach, covered by Mayoux, introduces women as the target customer for microfinance institutions in response to the existing welfare distribution structures. Institutions, which set poverty depth reduction goals in the first place, focus on women due to the evidence of a higher percentage of women among the World's poor (UNIFEM, 2010). In this framework women are assumed to be “the poorest of the poor”. Cheston and Kuhn (2002) call this phenomena “feminization of poverty” and claim that the raise in the female fraction among the poorest is a result of the gender discrimination within the households.

Targeting women in order to meet poverty reduction goals can be beneficial not only on an individual, but also on a household (or community) level. There is evidence that when women are increasing their incomes the overall welfare of the household is rising. Dobra (2009) claims that microfinance strategies should be tailored specifically for women due to their multiple responsibilities – woman being in charge of income generation and distribution within the family provides more potential opportunities for the increase of the household's consumption levels – generally, a significant fraction of the income is being spent on health or educational needs. The author provides empirical evidence, which confirms the presence of the multiplying effect of the welfare increase. However, Kabeer (2001) comes up with the forewarning that accumulation of capital can influence woman's personal choices, i.e. focus more on self-development than spending money on the household's consumption.

2.2.3 – FINANCIAL SELF-SUSTAINABILITY

The third concept, which has become the centre of polemics for the last decade is the financial self-sustainability of microfinance programmes. Self-sustainability of the institution is determined by its profitability levels and the extent to which it is dependent on the external financial resources. The debate is concerning mostly institutional dependency on donations, which can be diminished via targeting economically active and, hence, the most reliable of the poor. Brau and Woller (2004) refer to this group of customers as the “bankable poor”. Thus, the focus shifts from the Development Goals to efficiency and profit-seeking activities.

In order to evaluate institutional repayment performance, it is absolutely crucial to draw a distinction between delinquent and defaulted loans in this framework. Three different dependent variables are used to investigate the impact of female participation on repayment rates. Those variables can be linked to the repayment policies of the institution. Portfolio at risk > 30 days is most widely used as a determinant of the health of the MFI's portfolio, and Portfolio at risk > 90 days is relying on the more relaxed assumption that loans can be delinquent for 90 days instead of 30. Moreover, it can be assumed that the write off ratio in the current case indicates the worst-case scenario, when there is no probability of the loan to be repaid and it is being classified as defaulted.

The crucial question for MFIs, which are targeted to be financially independent, is how to gain positive profits, increase repayments and portfolio quality.

According to previous articles (Opoku *et al*, 2009), the increase in female participation can be one of the useful tools for the financial performance improvement. Hunt and Kasynathan (2002) claim that women-targeted microfinance programs provide high repayments due to the fact that women tend to use the loan more effectively, they are naturally more risk averse and tend to invest in less venture projects. To confirm this assumption further, Cheston and Kuhn (2002) provide an example of male-lending groups in Ghana, which illustrates that males tend to compete with each other and hence take more risks.

The following literature review section provides more in-depth empirical evidence on the correlation between female participation and repayment performance.

2.3 – REVIEW OF PREVIOUS LITERATURE

2.3.1 – GENDER COMPOSITION AND REPAYMENT

Researchers worldwide have broadly investigated the impact of female inclusion on repayment rates of the microfinance institutions. Generally, the percentage of female borrowers is included as one of the controls for repayment performance (Ayayi and Sene, 2010; Agier and Szafarz, 2010). The empirical evidence is mixed. Obtained results rely heavily on the investigated time frames, datasets and included control variables.

Strong positive correlation between female inclusion and repayment rates has been obtained by the recent studies (Koveos and Randhawa (2004); D'Espallier *et al*, 2011). Cheston and Kuhn (2002) find that the borrowing groups with no female members have the highest probabilities of defaulting in the microfinance program introduced by Cocoa Arabopa Association in Ghana.

D'Espallier *et al* (2011) provide the empirical evidence that MFIs with a greater focus on women enjoy higher repayment rates. This study covers the sample of 350 microfinance institutions across 70 countries. The authors claim that, prior to their research, the relationship between female participation and MFIs' performance has hardly been the subject to the in-depth empirical investigation and the conclusions have been drawn mostly relying on existing anecdotal evidences. In their study the percentage of female borrowers is being treated as one of the main variables of interest.

Crombrughe *et al* (2008) and Saravia-Matus and Saravia (2012) also provide evidence that female client repayment performance is better than male's. The estimation results define the negative coefficient for the female participation variable, which indicates that including female borrowers decreases portfolio at risk values.

However, there exists empirical evidence that contradicts common belief that favoring women borrowers can enhance an institution's financial performance. The range of studies (Richman and Fred, 2010; Nawaz, 2010; Ayayi and

Sene, 2010) finds that gender composition does not have any convincing impact on MFI's repayments. The paper produced by Richman and Fred (2010) finds that the increasing amount of male inclusion decreases portfolio at risk, however the magnitude of the impact is not significant. Their sample includes 5-year data on 79 randomly sampled MFIs in Ghana, starting from the year 2003.

Ayayi and Sene (2010) find that the percentage of female clients has an insignificant effect on the financial sustainability of the institutions. Paper covers 217 MFIs in 101 countries for the years 1998-2006. Results show that the scope of activities being funded by the credits provided to women is not highly profitable, hence lending to women does not create any room for establishing higher interest rates, which would increase the sustainability of the institution. They do not find any support for the idea that female borrowers are more reliable than male.

The controversial point of view also finds support in the academic world. There exists a range of studies, which disclose the negative impact of the participation of women on repayment rates. Hermes *et al* (2011) use the global-level data and find out that the institutions with more female clients tend to be less efficient. The authors claim that the higher levels of profitability can be obtained only by giving up the poor clientele. In terms of gender composition, they suggest that in order to maintain high levels of sustainability the institutions should shift their focus towards male borrowers. The result remains robust also after considering the list of control variables.

A review of existing empirical research concludes that female inclusion has significant impact on repayments only if other internal and external factors are taken into consideration. Hence, it is essential to justify the choice of the control variables, which need to be included in the regression in order to produce the robust estimations.

2.3.2 ~ MFI'S LEGAL STATUS

The observed sample covers the different types of microfinance institutions. The distinction among the different institutions is being drawn by The World Bank (Van Greuning, 1998). The legal status of the institution determines the scope of services and levels of responsibilities it can carry:

- *Non-profit NGO* – voluntary and self-regulatory organization, its activity is not being sponsored by donations or loan capital;
- *Credit Union/Cooperative* – organization is being controlled by banking regulatory authority or credit rating entity and is allowed to provide depositing operations to its members;
- *Non-Banking Financial Institution (NBFI)* – the entity is providing the same services as banks, but is licensed under separated category (the MIX Glossary, 2011), it has lower requirements, but is still regulated by authorities;
- *Rural Bank* – microbanking institution with target clients in rural areas and the services tailored specifically to meet rural population needs (agricultural lending), fully regulated by banking legislation.

Hence, relying on the definitions above, it is observable that a NGO is the only legal form of the MFI, which is not subject to any financial regulation.

To control for the legal status a NGO dummy is included as a control variable in the regression. The legal status of a MFI is taken into consideration by D'Espallier *et al* (2011), Lapenu and Zeller (2001) and Lafourcade (2005). D'Espallier *et al* (2011) claim that NGOs tend to apply a more personalized attitude towards their customers comparing to the other listed types of institutions. Lapenu and Zeller (2001) find that regulated MFIs, such as banks and credit unions, have higher levels of staff productivity and performance together with the poorer depth of outreach. On the contrary, NGOs lose in terms of efficiency, but outperform the regulated institutions when it comes to reaching the poorest population.

2.3.3 ~ OUTREACH INDICATORS: FOCUS, AVERAGE LOAN AND PERSONNEL

Outreach, impact and sustainability should be considered as three main goals of microfinance institutions. Zeller and Meyer (2002) claim that financial sustainability, outreach and social impact present together “the triangle of microfinance”.

Outreach is determined by Navajas (2000) as “*a social value of the MFI's output*”. Conning (1999) defines outreach as the extent to which an MFI is serving the broad audience and, specifically, the poorest fraction of this audience. The outreach indicators should be included in this analysis in a comprehensive way to see if the institution really meets its social objectives and how the level of outreach impacts the repayment rates.

The level of outreach is investigated in the literature within two dimensions – the breadth and the depth (Osotimehin *et al*, 2011). The breadth of outreach enters the current research via controlling for the size of an institution, and the depth is represented by the MFI's focus and the average loan balance.

To control for the depth of outreach, following the literature, the variable “Average Loan balance to GNI per capita” is also included. Cull *et al* (2007), Crombrugge *et al* (2008) and Ruben and Schers (2007) take the size of a loan as an indicator of the depth of coverage, and this value can be either in absolute terms or relative to GNI per capita.

Authors claim that MFIs with higher average loan sizes obtain higher repayment rates and are in general more efficient. They find that institutions with higher average loans serve less female borrowers, as women traditionally demand smaller amounts with an open purpose.

As an additional control, Crombrugge *et al* (2008) include the size of MFIs. This indicator allows us to measure the outreach in terms of breadth. Different approaches exist in estimating the size – it can be measured by the total value of the portfolio, the number of borrowers or the amount of personnel. In the current research the natural logarithm of the amount of personnel is used as an indicator of the institution's size.

2.4 ~ HYPOTHESES FORMULATION

The current study evaluates the consequences of the inclusion of women from a financial perspective. The main question is if targeting women can assure sustainability and the higher repayments for the institution. This issue is being raised by D'Espallier *et al* (2011) on the global level and the findings indicate that the institutions with a higher fraction of female customers enjoy lower levels of portfolio at risk and write-off ratio. Accordingly, to find out if the results of the previous research are relevant for the sample used in the current study, the first hypothesis is being introduced:

H1: Increase in female participation has a positive impact on the repayment rates of microfinance institutions.

In a second step, the research investigates whether this impact of female participation on the repayment rates varies with the different characteristics of the institutions, such as its level of experience and outreach. Ahlin *et al* (2011) made the assumption that the performance of institutions improves with age, as MFIs become more competitive and familiar with the market conditions. The prediction is that within gaining experience the MFI is able to adjust its services to satisfy the needs of its targeted customers better. MFIs can choose to implement more impersonal enforcement procedures or, otherwise, rely more on the mutual trust between the institution and a client, developed through the years of cooperation.

Gender-repayment relations are expected to be influenced by the age of the institution. It is expected that mature institutions, being more familiar with the existing market features, benefit less from the inclusion of women rather than the newcomers. Mature institutions tend to rely more on already existing client base and include less first-time borrowers (Epstein and Yuthas, 2010). They have more opportunities to introduce individual services with higher average loans to their customers, and usually these features characterize the credit for male borrowers.

H2: New and young microfinance institutions benefit more from female inclusion.

Furthermore, the current study investigates if the impact of female inclusion varies with the legal status of MFI. Following the assumption of Mersland (2009), NGOs tend to have broader objectives and put more effort in developing gender-specific programs. NGOs tend to target a more vulnerable fraction of the population comparing to the regulated institutions. We expect that NGOs benefit more from targeting women than any other types of microfinance institutions because the lending services provided by NGOs are always held together with the specific training, close monitoring and individual attitude (D'Espallier, 2011), while banking institutions tend to work on more impersonal basis. This support is essential for the female customers to gain the most from arising entrepreneurial opportunities.

H3: NGOs benefit more from female inclusion than other types of microfinance institutions.

In line with Lapenu and Zeller (2001), the MFI's focus is determined through the location of its activities – in rural or urban areas. There is evidence that the larger fraction of the world's poor is located in the rural areas, hence the institutions, which target their services on rural population, tend to have higher outreach levels.

The subject of investigation is that the nature of activities and the policy implications for rural and urban institutions differ significantly and may let rural institutions benefit more from female inclusion. Rural microfinance is generally characterized by group lending in order to manage better the monitoring costs, and there exists empirical evidence that women perform much better in group lending than men (Mayoux, 2005).

H4: Rural MFIs benefit more from female participation than urban institutions.

The next outreach indicator to be included in the analysis is the average loan balance to GNI per capita. According to Guitierrez-Nieto *et al* (2009), the higher levels of this indicator can be interpreted as less depth of outreach, as in this case the fewer loans are being provided to the poor borrowers and the MFI focuses on the wealthier ones to reach the higher levels of self-sustainability and higher repayment rates.

It has been mentioned before that the credit provided to women is characterized by lower amounts and less risky activities. It is assumed that the institutions with the deeper outreach levels (lower average loans) tend to have lower repayment rates, but benefit more from female inclusion – they aim to target the poorest fraction of the population and, among those poorest, women are proved to be a more reliable audience.

H5: Institutions with smaller average loan balance benefit more from female inclusion.

In this research the breadth of outreach is measured by the amount of personnel. To control for the size of the institution also the log of total assets was included as it is done in the paper by D'Espallier *et al* (2011). However, this

variable never turned significant in the current sample. The natural logarithm of the amount of personnel can also be interpreted as an indicator of the size of the institution (von Stauffenber *et al*, 2003).

The following idea is examined: the more personnel the MFI employs, the higher is the breadth of its outreach and, hence, the more diversified portfolio it can develop. The assumption is that institutions with the broader outreach possibilities benefit less from female inclusion as they have other more efficient tools for reaching sustainability, such as introducing various lending schemes for the individual customers. And, as individual loans in the region are characterized by the higher amounts and, usually, the higher interest rates, it is more profitable for the institution with a sufficient amount of personnel to focus on these activities (Lafourcade , 2005).

H6: The positive impact of female inclusion is stronger for small MFIs.

To test the established hypotheses the dataset is divided on the following categories:

HYPOTHESES	CONDITION	DESCRIPTION
H2	$AGE_i(j)_{t=1}, AGE_i(j)_{t=2}$	The impact of female inclusion on performance of NEW and YOUNG girls
	$AGE_i(j)_{t=3}$	The impact of female inclusion on performance of MATURE MFIs
H3	$NGO_i(j)=1$	The impact of female inclusion on performances of NGOs
	$NGO_i(j)=0$	The impact of female inclusion on performance of non-NGOs
H4	$RURAL_i(j)=1$	The impact of female inclusion on performance of MFIs targeting RURAL areas
	$RURAL_i(j)$	The impact of female inclusion on performance of MFIs targeting URBAN areas
H5	$LOAN_i(j)>1$	The impact of female inclusion on performances of MFIs with average loan balance HIGHER than GNI per capita
	$LOAN_i(j)<1$	The impact of female inclusion on performances of MFIs with average loan balance LOWER than GNI per capita
H6	$PERSONNEL_i(j)_{t>100}$	The impact of female inclusion on performances of MFIs employing more than 100 staff members
	$PERSONNEL_i(j)_{t<100}$	The impact of female inclusion on performances of MFIs employing less than 100 staff members

2.5 DATA DESCRIPTION

The dataset used for the purposes of the current research is obtained from the MIX online database. It includes 180 MFIs for the years 2005-2009. Country-specific variables (HDI, FDI and education expenditures) are obtained from the World Bank database. The study focuses on Sub-Saharan Africa, particularly 14 ECOWAS countries (see Table 1.1 for the list of countries included in the dataset).

One hundred and eighty institutions included in this research analysis serve approximately 2 million clients in the ECOWAS region (2009). In the investigated sample 30% and 34% of the institutions report the positive return on assets (ROA) ratio along with the average portfolio at risk over 30 days of 7.85% and 11% for years 2005 and 2009 respectively. For comparison, in 2001 West-African MFIs reported average PaR value of 3.9% and 47% of respondents exhibited positive returns (Lafourcade *et al*, 2005). The numbers indicate that with the increase in outreach and the client base the market has become more volatile and the participants tend to take more financial risk.

According to the MIX database, women represent the majority of the borrowers for ECOWAS MFIs. On average, for the institutions, which report the fraction of female borrowers in the represented sample, the number is 66.8%. Hence the conclusion is that women indeed represent the considerable group of borrowers in West Africa.

From the Table 1.2 (see Appendix 1) it can be seen that the average value for the write-off ratio is much lower than for portfolio at risk, which reflects the theoretical predictions (D'Espallier *et al*, 2011). Distribution of the observations across the countries is represented by graphs 1.1-1.3 in Appendix 2.

To control for the experience of the institution the age dummy is constructed in the following way – New (1), Young (2) and Mature (3). The MIX database classifies MFIs to be new in the year of their establishment and mature after 5 years of operating on the local market. For the year 2009, 99 institutions out of 114 represented in the market report their experience level and, according to the data, 13% of the institutions in the sample just entered the market, 18% were young players, and 69% enjoyed benefits of being experienced in the area.

The NGO dummy is included to control for the legal status of the institution. Coming to disaggregation of the data in terms of MFI’s legal status, 30% of the West African sample is represented by NGOs, 32% – Credit Unions and Cooperatives, 9% – banks, 16% – rural banks and 13% – non-banking financial institutions (NBFI). Among those institutions, 53 (30% of the sample) provided the data for all considered 5 years and 27 (15% of the sample) - for 4 years out of the requested time horizon.

Table 1.3 represents the summary statistics. It provides the data on the number of observations for each variable, the mean, minimum and maximum values and its standard deviation.

According to the current statistic summary, the average MFI in the region is self-sufficient (102.6%), on average it covers its operating costs, employs 118 staff members, and provides average loans higher than GNI per capita value. Its portfolio at risk over 30 days is 9.3%, which means that on average more than 9% of the total loan portfolio is overdue after 30 days. It is considered to be a very significant number in microfinance practice. However, its write-off ratio is relatively low and equals 2.3%.

The correlation matrix (see Appendix 2) indicates the presence of a strong negative relationship between included dependent variables and percentage of female borrowers, which is in line with previous literature.

Table 2.3 Descriptive statistics

	N	MEAN	ST.DEV.	MIN	MAX
REPAYMENT					
PaR30	449	0.093	0.128	0	0.8
PaR90	337	0.061	0.089	0	0.719
Write-off	353	0.023	0.048	-0.0226	0.431
MFI					
Loan balance to GNI	554	1.105	0.025	0	39.039
Self-sufficiency	545	1.026	0.592	-0.391	8.416
Personnel	563	118	202	0	1923
Female borrowers	469	0.623	0.265	0	1
country					
FDI	624	0.038	3.809	0.005	0.468
HDI	624	0.449	0.09	0.317	0.693
N of MFIs	624	15	10	1	39
Education expenditures	481	0.046	0.009	0.02	0.06

2.6 – REGRESSION METHODOLOGY

2.6.1 – RELATION BETWEEN GENDER COMPOSITION AND REPAYMENT

The impact of female participation on the repayments is going to be investigated using the panel data analysis techniques. The dataset allows for observing the behavior of the variables across time for different institutions in different countries; hence the panel dataset is characterized by three dimensions (country, MFI and time).

The dependent variables (PaR>30, PaR>90 and Write-off ratio) are regressed on the female participation ratio, which is the independent variable of interest. Portfolio at risk > 30 days is determined as “the value of all the loans outstanding as for the end of the reported period that have one or more installments of principal past due for more than 30 days” (The MIX Glossary, 2011). PaR>90 has the same purpose but referred to the outstanding balance loans overdue > 90 days. Write-off ratio represents “the percentage of the MFI’s loans that has been removed from the balance of the gross loan portfolio because they are unlikely to be repaid” (The MIX Glossary, 2011).

The standard dependent variable in the literature is Portfolio at risk > 30 days (D’Espallier *et al*, 2011; Cull *et al*, 2007; Richman and Fred, 2010). But for the more in-depth investigation portfolio at risk > 90 days and write-off ratio are used, as they allow us to track the steps according to which the loan is being classified as financial loss.

The linear functional form is chosen to describe the relationship between repayment rates and the fraction of female borrowers referring to the previous literature (D’Espallier *et al*, 2011; Richman and Fred, 2010). In the regression only the variable PERSONNEL is introduced in the logarithmic form, because all other controls are represented either by the ratios or by dummies. The amount of active MFIs is also included in the linear form due to the low magnitude of the variable (maximum value is 39).

The estimated regression is going to look as follows:

$$\begin{aligned}
 (1) \quad PaR30_{i(j),t} &= \beta_0 + \beta_1 FEM_{i(j),t} + \beta_2 AGE_{i(j),t} + \beta_3 LOAN_{i(j),t} + \beta_4 \log(PERSONNEL_{i(j),t}) + \beta_5 FDI_{j,t} + \beta_6 FDI_{j,t} * FDI_{j,t} + \beta_7 EDU_{j,t} + \beta_8 HDI_{j,t} + \\
 &\beta_9 RURAL_{i(j)} + \beta_{10} NGO_{i(j)} + \beta_{11} MFIAMOUNT_{j,t} + \beta_{12} T_t + u_{i(j),t}, \\
 (2) \quad PaR90_{i(j),t} &= \beta_0 + \beta_1 FEM_{i(j),t} + \beta_2 AGE_{i(j),t} + \beta_3 LOAN_{i(j),t} + \beta_4 \log(PERSONNEL_{i(j),t}) + \beta_5 FDI_{j,t} + \beta_6 FDI_{j,t} * FDI_{j,t} + \beta_7 EDU_{j,t} + \beta_8 HDI_{j,t} + \\
 &\beta_9 RURAL_{i(j)} + \beta_{10} NGO_{i(j)} + \beta_{11} MFIAMOUNT_{j,t} + \beta_{12} T_t + u_{i(j),t}, \\
 (3) \quad WRITE_OFF_{i(j),t} &= \beta_0 + \beta_1 FEM_{i(j),t} + \beta_2 AGE_{i(j),t} + \beta_3 LOAN_{i(j),t} + \beta_4 \log(PERSONNEL_{i(j),t}) + \beta_5 FDI_{j,t} + \beta_6 FDI_{j,t} * FDI_{j,t} + \beta_7 EDU_{j,t} + \beta_8 HDI_{j,t} + \\
 &\beta_9 RURAL_{i(j)} + \beta_{10} NGO_{i(j)} + \beta_{11} MFIAMOUNT_{j,t} + \beta_{12} T_t + u_{i(j),t}.
 \end{aligned}$$

where:

PaR30_{i(j),t} – portfolio at risk > 30 days for MFI_i in Country_j at time period *t* (in other two specifications it is going to be Portfolio at risk > 90 days and Write-off ratio),

FEM_{i,t} – the percentage of female clients for MFI_i in Country_j at time period *t*,

AGE_{i(j),t} – the dummy of the institution’s experience (1=New, 2=Young, 3=Mature) for MFI_i in Country_j at time period *t*,

LOAN_{i(j),t} – the average loan balance to GNI per capita for MFI_i in Country_j at time period *t*,

Log(PERSONNEL_{i(j),t}) – natural logarithm of the total number of staff members for MFI_i in Country_j at time period *t*,

FDI_{j,t} – foreign direct investments, net inflows (% of GDP) for Country_j at time period *t*,

FDI_{j,t}*FDI_{j,t} – the squared value of foreign direct investment, net inflows (% of GDP) for Country_j at time period *t*,

EDU_{j,t} – fraction of public spending on education, total (% of government expenditure) for Country_j in time period *t*,

HDI_{j,t} – Human development Index for Country_j in time period *t*,

RURAL_{i(j)} – dummy, 1 if MFI operates in rural areas and 0 otherwise for MFI_i in Country_j (does not vary over time),

NGO_{i(j)} – dummy, 1 if MFI has a legal status of NGO and 0 otherwise for MFI_i in Country_j (does not vary over time),

MFIAMOUNT_{j,t} – number of MFIs per Country_j at time period *t*,

T_t – year dummy to control for time fixed effects,

u_{i(j),t} – robust error term clustered on country level.

In line with the literature, the specific controls to the regression are introduced. The indicator of sustainability, commonly included in the empirical papers (Sharma and Nepal, 1997; Richman and Fred, 2010), is self-sufficiency. The current research refers to the operational self-sufficiency, which is inevitable for an MFI to be able to meet its administrative costs and loan losses. The institution is considered to be sustainable if the OSS ratio is 100% or more (Sa-Dhan Technical Note #13, 2006). The sign of this variable’s coefficient is expected to be negative, hence the more operationally sustainable the institution is the lower are its risk determinants.

Moreover, following D’Espallier *et al* (2011), the number of MFIs in the economy is included as a regressor to control for the competition on the market. A study by Richman and Fred (2010) finds evidence that rising competition in the sector increases efficiency and repayment. However, the negative impact can be obtained due to the asymmetric information between the borrower and the lender on the credit market (McIntosh *et al*, 2004; Marquez, 2002; Hoff and Stiglitz, 1998).

To control for the time-varying country-specific characteristics the Human Development Index (HDI) is included, foreign direct investments (FDI, net inflows as % of GDP) and governmental educational expenditures (as % of total

governmental expenditures). These variables identify the development and economical pattern within each country involved in the sample. Controlling for HDI and governmental education expenditures, the level of social development of the nation can be identified, and it is expected that higher levels of HDI allow the institutions obtain better repayment rates (D’Espallier *et al*, 2011).

The variable FDI is included in order to investigate the impact of the foreign business participation, which also addresses the higher levels of development. It is represented by the ratio of net inflows (in % of GDP). Inclusion of the quadratic form (squared FDI) allows for the U-shaped relationship between FDI and MFI repayments (Alfaro *et al*, 2004). It can be argued that the larger amount of FDI increases the wealth of the economy itself and, hence, the ability of consumers to pay back rises.

The robust standard errors are used to prevent heteroscedasticity and intragroup correlations. Given that the independent variables are strictly exogenous, the presence of autocorrelation does not bias the estimators, but impacts solely the standard errors (Verbeek, 2008). Hence, to control both for heteroscedasticity and autocorrelation the standard errors clustered on a country level are used.

All three models are estimated once with country fixed effects and once with random effects. The fixed effects specification is used to investigate the impact of variables that evolve over time. Country fixed effects are introduced to reflect the assumption that individual characteristics of the countries can bias obtained estimators and there exists a necessity to control for them.

Random effects model provides us with a different insight as it assumes that the variation across countries is random and uncorrelated with the variables included in the model and the specification allows us to interpret the impact of time-invariant variables. The year dummies are still included to control for the time fixed effects in the regression.

Regressions (1)-(3) are estimated first using Random effects (which is in line with literature, D’Espallier *et al*, 2011) and then using the country fixed effects, in both cases the robust standard errors clustered at the country level are used to control for heterogeneity and autocorrelation. Hausman test could not be performed for the regressions with all the controls as the model did not meet the asymptotic assumptions. It tests if the error terms ($u_{i(j),t}$) are correlated with the regressors. As Hausman test is biased towards fixed effects, both results for estimation analysis are provided, but, following D’Espallier *et al* (2011), interpret only the random effects specification outcomes.

Furthermore, to test the hypotheses H2-H6 the investigation of MFI specific characteristics has been held, also for both country random and fixed effects. All the listed controls are added in those regressions, but not reported, so are the year dummies.

2.6.2 ~ INTERACTION TERMS

In addition to dividing the dataset in different categories, another technique is used to find out, what features MFI should possess in order to benefit mostly from female inclusion. The interaction terms are introduced in the regressions. D’Espallier *et al* (2011) argue that interaction effects can be used to investigate what specific conditions allow MFIs to benefit more from female inclusion.

The impact of the three different interaction terms is investigated to find out whether the influence of gender composition on performance varies within the reference categories. First of all, the examination of H2 requires the introduction of an interaction term (*Female participation * Age Dummy*). H3 is analyzed via introducing the term (*Female Participation * NGO Dummy*) and H4 – via the term (*Female participation * Rural Dummy*). The general equation is going to look as follows:

$$(4) \quad PaR30_{i(j),t} = \beta_0 + \beta_1 FEM_{i(j),t} + \beta_2 FEM_{i(j),t} * INT_{i(j),t} + \beta_3 AGE_{i(j),t} + \beta_4 LOAN_{i(j),t} + \beta_5 \log(PERSONNEL_{i(j),t}) + \beta_5 FDI_{j,t} + \beta_6 FDI_{j,t} * FDI_{j,t} + \beta_7 EDU_{j,t} + \beta_8 HDI_{j,t} + \beta_9 RURAL_{i(j)} + \beta_{10} NGO_{i(j)} + \beta_{11} MFIAMOUNT_{j,t} + \beta_{12} T_t + u_{i(j),t}.$$

$$(5) \quad PaR90_{i(j),t} = \beta_0 + \beta_1 FEM_{i(j),t} + \beta_2 FEM_{i(j),t} * INT_{i(j),t} + \beta_3 AGE_{i(j),t} + \beta_4 LOAN_{i(j),t} + \beta_5 \log(PERSONNEL_{i(j),t}) + \beta_5 FDI_{j,t} + \beta_6 FDI_{j,t} * FDI_{j,t} + \beta_7 EDU_{j,t} + \beta_8 HDI_{j,t} + \beta_9 RURAL_{i(j)} + \beta_{10} NGO_{i(j)} + \beta_{11} MFIAMOUNT_{j,t} + \beta_{12} T_t + u_{i(j),t}.$$

$$(6) \quad WRITE_OFF_{i(j),t} = \beta_0 + \beta_1 FEM_{i(j),t} + \beta_2 FEM_{i(j),t} * INT_{i(j),t} + \beta_3 AGE_{i(j),t} + \beta_4 LOAN_{i(j),t} + \beta_5 \log(PERSONNEL_{i(j),t}) + \beta_5 FDI_{j,t} + \beta_6 FDI_{j,t} * FDI_{j,t} + \beta_7 EDU_{j,t} + \beta_8 HDI_{j,t} + \beta_9 RURAL_{i(j)} + \beta_{10} NGO_{i(j)} + \beta_{11} MFIAMOUNT_{j,t} + \beta_{12} T_t + u_{i(j),t}.$$

Where all the variables are defined as for the equations (1)-(3) and $INT_{i(j),t}$ – interaction variable (*AGE, RURAL or NGO*) for MFI_{*i*} in Country_{*j*} in time period *t*.

The regressions (4)-(6) are estimated with both fixed and random effects using the robust standard errors clustered on the country level. Moreover, to estimate the isolated impact of each interaction variable, all the interaction terms are taken simultaneously. The results let us analyze whether the positive effect of female inclusion on repayment varies with the experience, legal status and focus of the institution.

2.7 ~ ESTIMATION RESULTS

2.7.1 ~ IMPACT OF FEMALE INCLUSION ON REPAYMENT RATE

Table 5.1a Estimation results: Portfolio at Risk > 30 days

DEPENDENT VARIABLE	PORTFOLIO AT RISK > 30 DAYS			
	(1)		(2)	
	RE	FE	RE	FE
Percentage of femaler borrowers	-0.075*** (0.020)	-0.077*** (0.020)	-0.074* (0.044)	-0.088* (0.047)
<i>Controls:</i>				
Age Dummy			0.022*** (0.044)	0.020*** (0.006)
Avarege Loan Balance to GNI			-0.009 (0.006)	-0.009 (0.006)
Self-sufficiency			-0.052*** (0.012)	-0.052*** (0.012)
Log (Personell)			-0.003 (0.002)	-0.004 (0.002)
FDI			-0.005 (0.004)	-0.010** (0.004)
FDI*FDI			0.000 (0.000)	0.000 (0.000)
Education Expenditures			0.000 (0.019)	0.069** (0.025)
HDI			0.003*** (0.001)	-0.003 (0.003)
Rural Dummy			-0.005 (0.019)	-0.011 (0.019)
NGO Dummy			0.002 (0.035)	0.007 (0.040)
Number of MFIs			0.002 (0.001)	0.002 (0.003)
N	418	418	315	315
R ²	0.03	0.03	0.14	0.02

Table 5.1b Estimation results: Portfolio at Risk > 90 days

DEPENDENT VARIABLE	PORTFOLIO AT RISK > 90 DAYS			
	(1)		(2)	
	RE	FE	RE	FE
Percentage of femaler borrowers	-0.076*** (0.024)	-0.077*** (0.024)	-0.105** (0.044)	-0.112** (0.048)
<i>Controls:</i>				
Age Dummy			0.014*** (0.005)	0.013*** (0.005)
Avarege Loan Balance to GNI			-0.008*** (0.003)	-0.008** (0.003)
Self-sufficiency			-0.080* (0.046)	-0.077 (0.053)
Log (Personell)			-0.005 (0.005)	-0.004 (0.005)
FDI			0.009* (0.005)	0.004 (0.004)
FDI*FDI			-0.000 (0.000)	-0.000 (0.000)
Education Expenditures			0.018 (0.018)	0.019 (0.027)
HDI			0.003*** (0.001)	-0.003 (0.003)
Rural Dummy			0.011 (0.018)	0.009 (0.019)
NGO Dummy			0.014 (0.029)	0.022 (0.034)
Number of MFIs			-0.001 (0.001)	-0.001 (0.004)
N	308	308	248	248
R ²	0.05	0.05	0.23	0.03

Notes: 1) Robust standard errors clustered on country level; 2) Time dummies are included in all regressions, not reported; 3) *** -1% confidence level, ** -5% confidence level, * -10% confidence level; 4) Specification FE uses country effects, RE corresponds to random effects.

Table 5.1c Estimation results: write-off ratio

DEPENDENT VARIABLE	WRITE-OFF RATIO			
	(1)		(2)	
	RE	FE	RE	FE
Percentage of femaler borrowers	-0.032*	-0.034*	-0.048*	-0.054
	(0.016)	(0.016)	(0.028)	(0.030)
<i>Controls:</i>				
Age Dummy			0.001 (0.004)	0.002 (0.004)
Avarege Loan Balance to GNI			-0.001 (0.006)	-0.002 (0.006)
Self-sufficiency			-0.025*** (0.007)	-0.025*** (0.007)
Log (Personell)			-0.002 (0.003)	-0.003 (0.003)
FDI			-0.003 (0.003)	-0.004 (0.002)
FDI*FDI			0.000 (0.000)	0.000** (0.000)
Education Expenditures			-0.008 (0.010)	-0.005 (0.014)
HDI			0.000 (0.000)	0.003 (0.002)
Rural Dummy			-0.010 (0.007)	-0.008 (0.006)
NGO Dummy			0.018 (0.015)	0.018 (0.015)
Number of MFIs			0.001 (0.001)	0.003 (0.018)
N	333	333	259	259
R ²	0.04	0.04	0.17	0.06

Notes: 1) Robust standard errors clustered on country level; 2) Time dummies are included in all regressions, not reported; 3) *** -1% confidence level, ** -5% confidence level, *-10% confidence level; 4) Specification FE uses country effects, RE corresponds to random effects.

As it was mentioned above, both estimations are reported, but the interpretation focuses on the random effects specification, as it has been done by D'Espallier *et al* (2011). The estimation results are provided in Table 5.1.

Table 5.1 shows that the percentage of female borrowers has a negative and significant impact regardless of the estimation method and the choice of the dependent variable. This confirms that *increasing amounts of female borrowers result in higher repayment rates of MFIs*: Column (2) of Table 5.1a (the preferred specification) shows that the Portfolio at Risk > 30 days decreases by 7.4% when the MFI has a 10% higher female participation ratio holding other controls constant. PaR > 90 and Write-off ratio are also influenced by the increased female participation and they diminish by 10.5% and 4.8% respectively. Inclusion of controls in the regression increases the magnitude of the impact of “Percentage of female borrowers” on the dependent variables.

These findings are in line with previous literature and confirm the Hypothesis 1. Hence it can be concluded that a higher share of female borrowers increases the repayment rates.

The age dummy obtains the positive and significant coefficient for PaR30 and PaR90. A negative sign of the coefficient was expected, as the initial assumption was that gaining the experience allows the institutions to operate more efficiently. However, to justify the obtained result, it can be claimed that portfolio at risk can increase with the experience of the institution because, being more familiar with the local environment and society, the institutions can afford not writing off the delinquent loans for a longer period. Hence, the institutions are taking more risk due to development of the long-lasting relationship and trust with its customers (Epstein and Yuthas, 2010). In case of write-off ratio, however, the age dummy is not significant.

Variable “Loan balance to GNI” is negative and significant for PaR > 90. The sign is in line with the expectations, the higher is the value of the variable, the lower is the level of outreach. As the consumers of the financial services are becoming wealthier, risk on non-repayment decreases.

The operational self-sufficiency ratio is included as an indicator for sustainability, hence the negative sign of the coefficient is straightforward – the higher the ratio is, the more sustainable the institution is going to be in terms of being able to cover its direct costs. The variable is significant in all the regressions investigated, as it was expected.

Variable ‘Personnel’ is included in the logarithmic form to control for the size of the institution. It never turns significant in the specifications, which means that the amount of employees, taken without any considerations of the worker’s efficiency, does not have any impact on repayment performance.

The education expenditure's coefficient never becomes significant for the random effects specifications, nor does FDI and FDI squared.

Referring to the previous academic paper by D'Espallier *et al* (2011) HDI should be negatively related to PaR indicators, which means that MFIs perform better in more developed countries. However, according to the estimations, the coefficient becomes significant for portfolio at risk variables in the random effects specification with a low magnitude of 0.3%. This result contradicts the expectations and the economic intuition. Probably, it can be based on the HDI components and its limitations. The issue is suggested to be investigated in future research.

Rural dummy, NGO dummy and the number of institutions also does not have any impact on repayments in the specification. The outcomes do not provide any support for the initial ideas about the depth of outreach, legal status and the presence of the competition putting significant impact on repayment rates.

2.7.2 - IMPACT OF VARIOUS CHARACTERISTICS ON THE RELATION BETWEEN GENDER AND REPAYMENT

In this section hypotheses 2 to 6 (Table 5.2) are examined. The analysis is held using the random effect specification outcomes. It is important to note, that all the controls listed in Table 5.1 are included in the regression, but not reported for the sake of space. The estimation focuses solely on the behavior of the variable of interest.

H2: New and young microfinance institutions benefit more from female inclusion.

To examine hypothesis H2 two separate regressions are introduced for new/young MFIs and for mature ones. There is no evidence of significance for PaR > 30 and write-off ratio. Commenting on the results for Portfolio at risk > 90 days being treated as the dependent variable, it is observable that female inclusion is strongly significant (at 1% confidence level) for New and Young institutions. For new and young MFIs 10% increase in female participation decreases portfolio at risk > 90 days by 13.5%. Hence, conclusion is that new and young institutions definitely benefit from female inclusion, but the results do not clearly determine the magnitude of the impact for mature MFIs. Hence, *hypothesis 2 cannot be fully confirmed or rejected.*

Table 5.2 Estimation results: Categories

DEPENDENT VARIABLE	PORTFOLIO AT RISK > 30 DAYS		PORTFOLIO AT RISK > 90 DAYS		WRITE-OFF RATIO	
	N of observations	(1) RE FE	N of observations	(1) RE FE	N of observations	(1) RE FE
HYPOTHESIS 2						
Percentage of female borrowers (if age = New/Young)	125	-0.061 (0.061) -0.092 (0.061)	74	-0.135*** (0.036) -0.138*** (0.032)	95	-0.053 (0.039) -0.072* (0.037)
Percentage of female borrowers (if age = Mature)	190	-0.125 (0.079) -0.126 (0.090)	174	0.112 (0.071) -0.127 (0.082)	164	-0.044 (0.037) -0.045 (0.039)
HYPOTHESIS 3						
Percentage of female borrowers (if Dummy NGO = 0)	110	-0.167 (0.198) -0.0902 (0.193)	80	-0.235* (0.141) -0.229 (0.130)	94	-0.123 (0.094) -0.129 (0.092)
Percentage of female borrowers (if age = Mature)	205	-0.035 (0.031) -0.044 (0.026)	168	-0.056*** (0.017) -0.050*** (0.015)	165	-0.017 (0.016) -0.025 (0.019)
HYPOTHESIS 4						
Percentage of female borrowers (if Dummy RURAL = 1)	132	-0.154*** (0.067) -0.203* (0.102)	103	-0.165* (0.096) -0.190* (0.102)	98	-0.077* (0.044) -0.092* (0.062)
Percentage of female borrowers (if Dummy Rural = 0)	183	-0.010 (0.035) -0.127 (0.035)	145	-0.067*** (0.024) -0.127 (0.023)	161	-0.029 (0.024) -0.041 (0.028)
HYPOTHESIS 5						
Percentage of female borrowers (if average Loan to GNI = 1)	85	-0.119 (0.082) -0.147* (0.080)	78	-0.140** (0.069) -0.154** (0.063)	74	-0.039 (0.039) -0.054* (0.026)
Percentage of female borrowers (if average Loan to GNI = 0)	230	-0.179* (0.045) -0.085* (0.047)	170	-0.081*** (0.021) -0.068*** (0.021)	185	-0.050 (0.032) -0.041 (0.027)
HYPOTHESIS 6						
Percentage of female borrowers (if Personel >100)	85	-0.020 (0.031) -0.004 (0.059)	89	-0.006 (0.035) 0.025 (0.041)	77	-0.016 (0.017) -0.024 (0.024)
Percentage of female borrowers (if Personel <100)	228	-0.091* (0.051) -0.116* (0.052)	157	-0.158** (0.063) -0.166 (0.062)	182	-0.064 (0.037) -0.068 (0.039)

Notes: 1) Robust standard errors clustered on country level; 2) Time dummies are included in all regressions, not reported; 3) *** -1% confidence level, ** -5% confidence level, * -10% confidence level; 4) Specification FE uses country effects, RE corresponds to random effects.

H3: NGOs benefit more from female inclusion than other types of microfinance institutions.

After dividing the sample according to the legal status of the included institutions, none of straightforward evidence is found that NGOs benefit more from targeting women. For NGOs female participation is significant only at 10% confidence level for PaR>90. This result is not convincing enough to draw conclusions, hence *there is no empirical support for hypothesis 3.*

H4: Rural MFIs benefit more from female participation than urban institutions.

The dummy is (1) for the institutions, which provide their services in rural areas. Results claim that those which operate in the rural environment benefit more (16.5% comparing to 6.7% for urban) from the inclusion of women in terms of Portfolio at risk > 90 days. This outcome is in line with the expectations. In rural areas individual lending is considered to be a venture activity. Women tend to participate in self-monitored group borrowing schemes, which are considered to be less risky and, hence, female borrowers perform better in terms of repayment. *Hypothesis 4 is confirmed.*

H5: Institutions with smaller average loan balances benefit more from female inclusion.

The distinction between MFIs in terms of its Average Loan balance to GNI ratio should be drawn to determine the level of outreach. Hence institutions with a ratio > 1, have a lower level of outreach, as the average loan size is considered to be too large to reach the poorest population. It is clear from the results, that although all the MFIs benefit from working with female borrowers, the magnitude for those with lower levels of outreach is nearly twice as high (14% comparing to 8.1% for PaR90).

This outcome contradicts the initial expectations. Hypothesis 5 is rejected in favor to the alternative hypothesis that *institutions with smaller average loan balance benefit less from female inclusion.* A possible explanation is that with the increase in average loan amount, institutions tend to target economically a more active fraction of population. An increase in women's participation targets the entrepreneurial females, which have been proven to be the most reliable clients due to their engagement into the retail sector activities, which are characterized by the fast turnover and higher profitability (Kiva.org Database, 2012, D'Espallier *et al*, 2011).

H6: The positive impact of female inclusion is stronger for small MFIs.

The impact of female participation is also investigated in terms of the organization's size. The results support the idea that the smaller institutions (in the current case, with less than 100 employers) benefit significantly from female inclusion. However, there is no evidence that female inclusion is significant for the relatively large institutions.

The insignificance of the personnel variable for the large MFIs can be explained by their ability to diversify portfolios not only in terms of gender, but also the regions and activities, while the smaller ones are strongly advised to focus more on the gender composition to gain the higher levels of sustainability. As the results are not significant, *hypothesis 6 cannot be either confirmed, or rejected.*

2.7.3 ~ INTERACTION TERMS

In order to be able to draw the unbiased conclusions, a different approach for the investigation of hypotheses 2, 3 and 4 (Table 5.3) is implemented. According to D'Espallier *et al* (2011), the introduction of the interaction terms represents the relation between gender and repayments in the reference categories. This approach allows us to identify if the positive effect of the inclusion of women differs with the experience, legal status and the focus of each MFI. The results obtained using this method can differ from the estimations presented before. Here the regression analyses the whole sample with respect to the categories of interest, whereas previously the fractions of the sample were included separately.

The results reveal that for the dependent variable Portfolio at Risk > 30 days the interaction term (Female borrowers*RURAL) returns significant results, which means that the *relation between gender composition and repayment varies with the MFI's focus.* Inclusion of all the interaction terms simultaneously also produces significant results for the RURAL interaction variable, hence the isolated impact persists. Together with the result obtained in the previous section outcomes provide *the strong support for hypothesis 4.*

The results of the previous section did not allow us to draw any precise conclusion for hypotheses 2 and 3. Splitting the sample did not identify, which category benefits more from female inclusion, hence it is important to investigate, if the impact exists in the first place.

(Female borrowers*AGE) and (Female borrowers*NGO) interaction terms do not produce any significant results in the specifications. The outcome is that relation between gender composition and repayment do not vary with the institution's experience and its legal status. In the previous section analysis did not reveal any empirical support for hypotheses 2 and 3 using the different investigation method. Hence, relying on the results produced by the interaction variables, hypothesis 2 and hypothesis 3 are rejected for the considered sample.

Table 5.3 Estimation results: Interaction terms

DEPENDENT VARIABLE: PORTFOLIO AT RISK > 30 DAYS

	(1)		(2)		(3)		(4)	
	RE	FE	RE	FE	RE	FE	RE	FE
Percentage of femaler borrowers	-0.047 (0.036)	-0.065* (0.036)	-0.033 (0.030)	-0.043 (0.030)	-0.021 (0.031)	-0.041 (0.033)	-0.022 (0.045)	-0.001 (0.040)
(Female borrowers* AGE)	-0.041 (0.046)	-0.036 (0.047)					-0.028 (0.034)	-0.023 (0.033)
(Female borrowers* NGO)			-0.168 (0.203)	-0.176 (0.030)			-0.148 (0.197)	-0.160 (0.204)
(Female borrowers* RURAL)					-0.106* (0.051)	-0.089* (0.047)	-0.084* (0.043)	-0.063 (0.037)
<i>Other controls</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>
N	315	315	315	315	315	315	315	315
R ²	0.15	0.02	0.17	0.02	0.26	0.02	0.17	0.03

DEPENDENT VARIABLE: PORTFOLIO AT RISK > 90 DAYS

	(1)		(2)		(3)		(4)	
	RE	FE	RE	FE	RE	FE	RE	FE
Percentage of femaler borrowers	0.095*** (0.031)	-0.094** (0.031)	-0.058*** (0.018)	-0.058*** (0.016)	-0.074*** (0.025)	-0.076** (0.028)	-0.047 (0.035)	-0.036 (0.033)
(Female borrowers* AGE)	-0.007 (0.034)	-0.023 (0.044)					0.005 (0.025)	-0.008 (0.031)
(Female borrowers* NGO)			-0.186 (0.166)	-0.197 (0.164)			-0.188 (0.159)	-0.188 (0.158)
(Female borrowers* RURAL)					-0.059 (0.063)	-0.067 (0.057)	-0.032 (0.036)	-0.036 (0.033)
<i>Other controls</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>
N	248	248	248	248	248	248	248	248
R ²	0.23	0.04	0.27	0.07	0.24	0.02	0.28	0.07

DEPENDENT VARIABLE: WRITE-OFF RATIO

	(1)		(2)		(3)		(4)	
	RE	FE	RE	FE	RE	FE	RE	FE
Percentage of femaler borrowers	-0.039 (0.025)	-0.052* (0.026)	-0.098 (0.092)	-0.024 (0.018)	-0.028 (0.023)	-0.037 (0.041)		-0.022 (0.037)
(Female borrowers* AGE)	-0.013 (0.023)	-0.003 (0.028)						0.008 (0.017)
(Female borrowers* NGO)			-0.111 (0.092)	-0.106 (0.096)				-0.103 (0.090)
(Female borrowers* RURAL)					-0.042 (0.038)	-0.037 (0.041)		-0.018 (0.028)
<i>Other controls</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>	<i>Added</i>
N	259	259	259	259	259	259	259	259
R ²	0.17	0.06	0.22	0.09	0.18	0.06	0.22	0.09

Notes: 1) Robust standard errors clustered on country level; 2) Time dummies are included in all regressions, not reported; 3) *** -1% confidence level, ** -5% confidence level, * -10% confidence level; 4) Specification FE uses country effects, RE corresponds to random effects

This paper uses the dataset of 180 microfinance institutions for the years 2005-2009 in West Africa in order to investigate how female inclusion impacts the loan repayment performance. The study challenges the popular idea that women are more reliable clients for microcredit than man. To investigate the behavior of repayment rates three dependent variables are included separately – portfolio at risk > 30 days, portfolio at risk > 90 days and write-off ratio. These indicators are widely used in the supporting literature.

The findings provide evidence that the institutions, which tend to include more women in their client base, exhibit better performance rates. Results also show that the institutions with the larger average loan amount, and those, which operate in rural areas, should favor women more in order to improve their performance. Meanwhile, the outcomes suggest that experience and the legal status do not have any impact on the relation between gender composition and repayment.

The results have significant practical implications. This paper provides an argument that women-targeted microfinance policy is more beneficial for the lending institutions in Western Africa. Especially, this result concerns the rural MFIs in the region. As the academic papers produce different results from one region to another, this study contributes to the field via providing recommendations specifically for West Africa.

As the vast majority of studies on microfinance, the research suffers from the data limitations. The drawbacks lie not only in the extent of data availability, but also in its quality. Information provided by the MIX indicates that some institutions exhibit perfect returns, which is hardly representing the real situation. The data is being reported by the institutions themselves, hence there is room for misrepresentation and nondisclosure of unfavorable information. It is claimed that the further research should be conducted via the field studies in order to obtain the complete understanding of the relation between financial performance and gender composition in microfinance.

REFERENCES

- AGIER, I. AND SZAFARZ, A. (2010). "Microfinance and Gender: Is There a Glass Ceiling in Loan Size?" CEB Working Paper N° 10/047.
- AHLIN, C., LIN, J. AND MAIO, M. "Where does microfinance flourish? Microfinance institution performance in macroeconomic context," *Journal of Development Economics*. 95 (2): 105-120.
- ALFARO, L., CHANDA, A., KALEMLI-OZCAN, S. AND SAYEK, S. (2004). "FDI and economic growth: the role of local financial markets," *Journal of International Economics*. 64 (1): 89-112.
- AUDU, M.L. AND ACHEGBULU, J.O. (2011). "Microfinance and Poverty Reduction: The Nigerian Experience," *International Business and Management*. 3 (1): 220-227.
- AYAYI, A.G. AND SENE, M. (2010). "What drives microfinance institution's financial sustainability," *The Journal of Developing Areas*. 44 (1): 303-324.
- BANERJEE A., DUFLO E., GLENNERSTER R. AND KINNAN C. (2009). "The Miracle of microfinance? Evidence from a randomized evaluation," MIT Department of Economics . <http://econ-www.mit.edu/files/4162> (retrieved 12nd July 2012).
- BRAU, J.C. AND WOLLER, G.M. (2004). "Microfinance: A Comprehensive Review of the Existing Literature," *Journal of Entrepreneurial Finance and Business Ventures*. 9 (1): 1-26.
- CHESTON, S. AND KUHN, L. (2002). "Empowering Women through Microfinance". Women's Opportunity Fund, UNIFEM publication, <http://www.microcreditsummit.org/papers/empowerment.pdf> (retrieved 3rd May 2012).
- CONNING J. (1999). "Outreach, Sustainability and Leverage in Monitored and Peermonitoring Lending", *Journal of Development Economic*. 60: 229-248.
- CULL, R., DEMIRGÜÇ-KUNT, A. AND MORDUCH, J. (2007). "Financial Performance and Outreach: A Global Analysis of Leading MicroBank," *Economic Journal*, 117: F107-F133.
- D'ESPALLIER, B., GUÉRIN, I. AND MERSLAND, R. (2011). "Women and Repayment in Microfinance: A Global Analysis," *World Development*, 39 (5): 758-772.
- DALEY-HARRIS, S. (2009). "Summit Campaign Report," the Microcredit Summit Campaign. http://www.ruralfinance.org/fileadmin/templates/rflc/documents/1253177264086_SOCR2009_English.pdf (retrieved 1st July 2012).
- DE CROMBRUGGHE, A., TENIKUE, M. AND SUREDA, J. (2008). "Performance Analysis For A Sample Of Microfinance Institutions In India," *Annals of Public and Cooperative Economics*, 79 (2): 269-299.
- DE HAAN, L. AND LAKWO, A. (2010). "Rethinking the Impact of Microfinance in Africa: 'Business Change' or Social Emancipation," *European Journal of Development Research*, 22 (4): 529-545.
- DIMANDJA, A.L. (2004). "The Role and Place of Women in Sub-Saharan African Societies". <http://www.globalaging.org/elder-rights/world/2004/subsaharan.htm> (accessed 13rd June 2012).
- DOBRA, A. (2009). "Acute poverty alleviation through women's targeting by microfinance programs," MPRA Paper, Unpublished. http://mpra.ub.uni-muenchen.de/16874/1/MPRA_paper_16874.pdf (retrieved 21st June 2012).

- EPSTEIN, M.J. AND YUTHAS, K. (2010). "Mission impossible: diffusion and drift in the microfinance industry," *Sustainability Accounting, Management and Policy Journal*. 1 (2): 201-221.
- GUTIÉRREZ-NIETO, B., SERRANO-CINCA, C. AND MAR-MOLINERO, C. (2009). "Social efficiency in microfinance institutions," *Journal of Operational Research Society*. 60 (1): 104-119.
- HERMES, N., LENSINK, R. AND MEESTERS, A. (2011). "Outreach and Efficiency of Microfinance Institutions," *World Development*. 39 (6): 938-948.
- HOFF, K. AND STIGLITZ, J. (1998). "Moneylenders and Bankers: Price-Increasing Subsidies in a Monopolistically Competitive Market," *Journal of Development Economics*. 55: 485-518.
- HUNT, J., AND KASYNATHAN, N. (2002). "Reflections on microfinance and women's empowerment," *Development Bulletin*, 57: 71-75
- 8????? (2001). "Conflicts over credit: Re-evaluating the empowerment potential of loans to women in rural Bangladesh," *World Development*, 29 (1): 63-84.
- KIVA BORROWERS DATABASE. <http://www.kiva.org/> (retrieved 20th May 2012).
- KOTIR, J. AND OBENG-ODOOM, F. (2009). "Microfinance and Rural Household Development: A Ghanaian perspective," *Journal of Developing Societies*, 25 (1): 85-105.
- KOVEOS, P. AND RANDHAWA, D. (2004). "Financial services for the poor: assessing microfinance institutions", *Managerial Finance*, 30 (9): 70-95.
- LAFOURCADE, A.C., ISERN, J., MWANGI, P. AND BROWN, M. (2005). "Overview of the outreach and financial performance of micro-finance institutions in Africa," Microfinance Information Exchange (MIX).
- LAPENU, C. AND ZELLER, M. (2001). "Distribution, growth and performance of microfinance institutions in Africa, Asia and Latin America," FCND discussion paper 114, Washington, DC: International Food Policy Research Institute (IFPRI). <http://www.ifpri.org/sites/default/files/publications/fcnbr114.pdf> (retrieved 27th June 2012).
- MARQUEZ, R. (2002). "Competition, Asymmetric Information, and Information Dispersion in the Banking Industry," *Review of Financial Studies*. 15 (3): 901-926.
- MAYOUX, L. (2005). "Women's Empowerment through Sustainable Micro-finance: Rethinking 'Best Practice'," Discussion Draft. <http://www.sed.manchester.ac.uk/research/iarc/ediais/pdf/WomensEmpowermentthroughSustainableMicrofinance.pdf> (retrieved 1st June 2012).
- MAYOUX, L. AND HARTL, M. (2009). "Gender and rural microfinance: Reaching and empowering women: Guide for Practitioners," IFAD. http://www.ifad.org/gender/pub/gender_finance.pdf (retrieved 6th June 2012).
- MCINTOSH C., DE JANVRY, A. AND SADOULET, E. (2004). "How Rising Competition Among Microfinance Institutions Affects Incumbent Lenders," *The Economic Journal*. 115 (506): 987-1004.
- MERSLAND, R. (2009). "The Cost of Ownership in Microfinance Organizations," *World Development*, 37 (2): 469-478.
- NAVAJAS, S., SCHREINER M., MEYER, R. L., GONZALEZ-VEGA C. AND RODRIGUEZ-MEZA J. (2000). "Microcredit and The Poorest: Theory and Evidence from Bolivia," *World Development*. 28: 333-346.
- NAWAZ, A. (2010). "Issues in Subsidies and Sustainability of Microfinance: An Empirical Investigation," Centre Emile Bernhiem (CEB). Working Paper N° 10/010 2010.
- OPOKU E., DZENE R., CARIA S., TEAL F., AND ZEITLIN A. (2009). "Improving productivity through group lending: Report on the Impact Evaluation of the Cocoa Abrabopa" Initiative Working Paper Series. <http://www.csae.ox.ac.uk/output/reports/pdfs/rep2008-01.pdf> (retrieved 15th June 2012).
- OSOTIMEHIN, K.O., JEGEDE, C.A. AND AKINLABI, B. H. (2011). "Determinants of microfinance outreach in South-Western Africa: an empirical analysis," *Interdisciplinary Journal of Contemporary Research in Business*. 3 (8).
- RICHMAN, D. AND FRED, A.K. (2010). "Gender Composition, Competition And Sustainability Of Micro Finance In Africa - Evidence From Ghana's Microfinance Industry," CSAE 25th Anniversary Conference 2011:Economic Development in Africa. <http://www.csae.ox.ac.uk/conferences/2011-EDiA/papers/175-Dzene.pdf> (retrieved 23rd June 2012).
- RUERD, R. AND SCHERS, S. (2007) "Microfinance Portfolio Performance: An Explorative Analysis of Determinants of Outreach, Sustainability and Risk," Centre for International Development Issues Nijmegen (CIDIN), Contributed Paper – Conference 'Microfinance: What Do We Know'. <http://www.rug.nl/feb/informatievoor/bedrijvenoverheden/somappliedresearch/onderzoekscentra/cibif/conferences/microfinance/program/RubenAndSchers.pdf> (retrieved 14th July 2012).
- SA-DHAN MICROFINANCE MANAGER SERIES. (2006). Technical Note # 13. "What is Operating Self-Sufficiency? How to use it in Microfinance?" http://www.sa-dhan.net/Adls/Technicalnotes/Technical_Notes_13.pdf (retrieved 11th July 2012).
- SARAVIA-MATUS, S. AND SARAVIA, J. (2012). "Gender Issues in Microfinance and Repayment Performance: The Case of a Nicaraguan Microfinance Institution," *Encuentro*, 91: 7-31.
- SHARMA, S. R. AND NEPAL, V. (1997). "Strengthening of Credit Institutions. Programs for rural poverty alleviation in Nepal," United Nations, Economic and Social Council (ECOSOC) for Asia and Pacific, Bangkok, Thailand.
- SHREINER, M. (2001). A Cost-Effective Analysis of the Grameen Bank of Bangladesh . Washington University: St. Louis Centre for Social Development Working Paper.
- THE INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT / THE WORLD BANK. (2011). "Doing Business 2011: Making a Difference for Entrepreneurs ECOWAS," http://siteresources.worldbank.org/INTAFRICA/Resources/DB2011-sheet_west-africa.pdf (retrieved 11th June 2012).
- THE MIX GLOSSARY. (2011). <http://www.mixmarket.org/about/faqs/glossary> (retrieved 15th June 2012).

- THE UNITED NATIONS. (2009). "World Survey on the Role of Women in Development: Women's Control over Economic Resources and Access to Financial Resources, including Microfinance," Department of Economic and Social Affairs, Division for the Advancement of Women. <http://www.un.org/womenwatch/daw/public/WorldSurvey2009.pdf> (retrieved 10th July 2012).
- THE WORLD BANK. (2012). "Africa Regional Brief," http://web.worldbank.org/website/external/countries/efricaext/0_menuPK:258652-pagePK:146732-piPK:146828-theSitePK:258644,00.html (retrieved 11th June 2012).
- UNIFEM. (2010). Facts and Figures on Women, Poverty and Economics. http://www.unifem.org/gender_issues/women_poverty_economics/facts_figures.php (retrieved 23rd June 2012).
- VAN GREUNING, H., GALLARDO, J. AND RANDHAWA, B. (1998). "A Framework for the Regulation of Microfinance Institutions," Financial Sector Development Department. Washington, D.C., The World Bank.
- VERBEEK, M.J.C.M. (2008). A Guide to Modern Econometrics, 3rd edition. Chichester: John Wiley and Sons.
- VON STAUFFENBERG, D., JANSSON, T., KENYON, N. AND BARLUENGA-BADIOLA, M. (2003). "Performance Indicators for Microfinance Institutions. Technical Guide," 3rd Edition MicroRate & Inter-American Development Bank. <http://www.microfinancegateway.org/p/site/m/template.rc/1.9.29094/> (retrieved 10th July 2012).
- ZELLER, M. AND MEYER, R. L. (2002). "The Triangle of Microfinance: Financial Sustainability, Outreach and Impact," Food Policy Statement IFPRI, 40. <http://ageconsearch.umn.edu/bitstream/16592/1/fp020040.pdf> (retrieved 12th June 2012).
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APPENDICES

Appendix 1. Sample description

Table 1.1

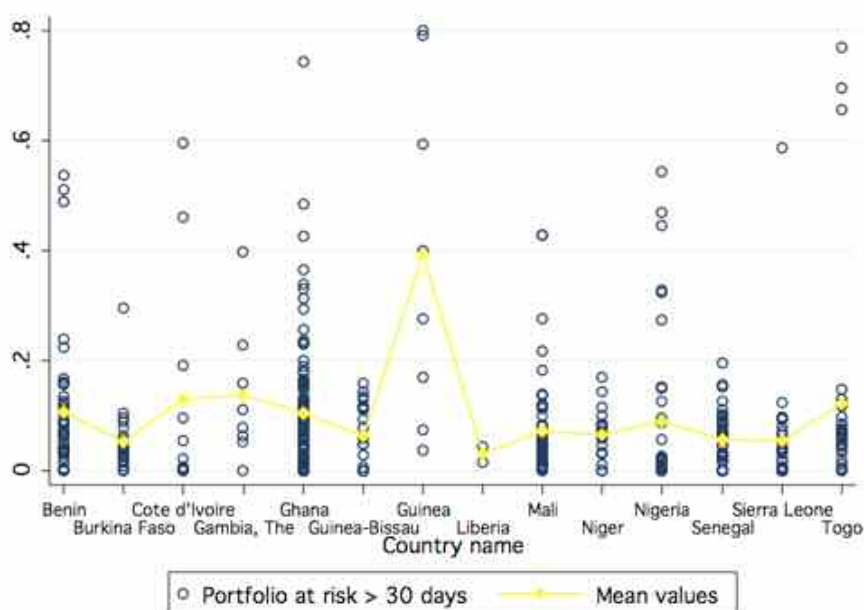
COUNTRY*	NGO	NBFI	CREDIT UNION/ COOPERATIVE	RURAL BANK	BANK	TOTAL	FRACTION
1 Beninn	6	1	6	0	0	13	7.22%
2 Burkina Faso	6	2	4	0	0	12	6.67%
3 Cote d'Ivoire	0	1	5	0	0	6	3.33%
4 Gambia, The	0	2	0	0	0	2	1.11%
5 Ghana	17	5	0	26	0	48	26.67%
6 Guinea-Bissau	1	0	3	0	1	4	2.22%
7 Guinea	1	3	3	0	0	8	4.44%
8 Liberia	1	1	1	0	0	3	1.67%
9 Mali	7	1	10	0	0	18	10.00%
10 Niger	0	1	5	0	0	6	3.33%
11 Nigeria	5	3	0	0	14	22	12.22%
12 Senegal	1	1	15	0	0	17	9.44%
13 Sierra Leone	5	2	0	2	2	11	6.11%
14 Togo	4	0	6	0	0	10	5.56%

TOTAL
FRACTION

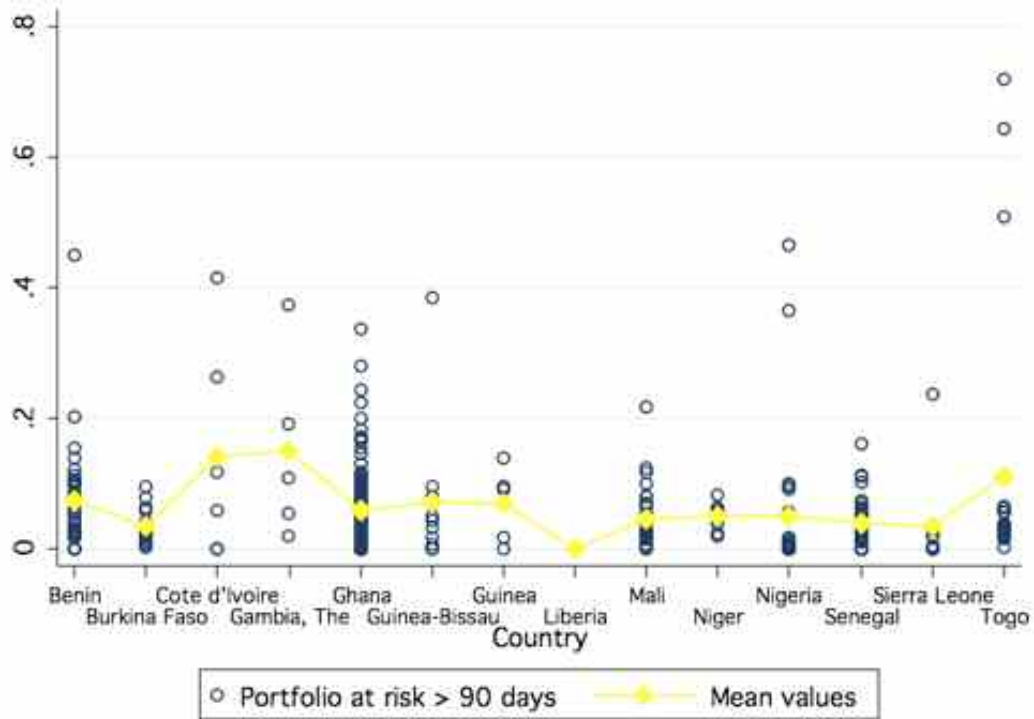
* Cape Verde is excluded from the sample due to the lack of data on MFIs.

N OF OBSERVATIONS	AVARAGE	
	2005	
par_30	83	7.85%
par_90	41	6.14%
write-off	43	2.25%
	2009	
par_30	67	11.13%
par_90	68	6.35%
write-off	64	3.31%

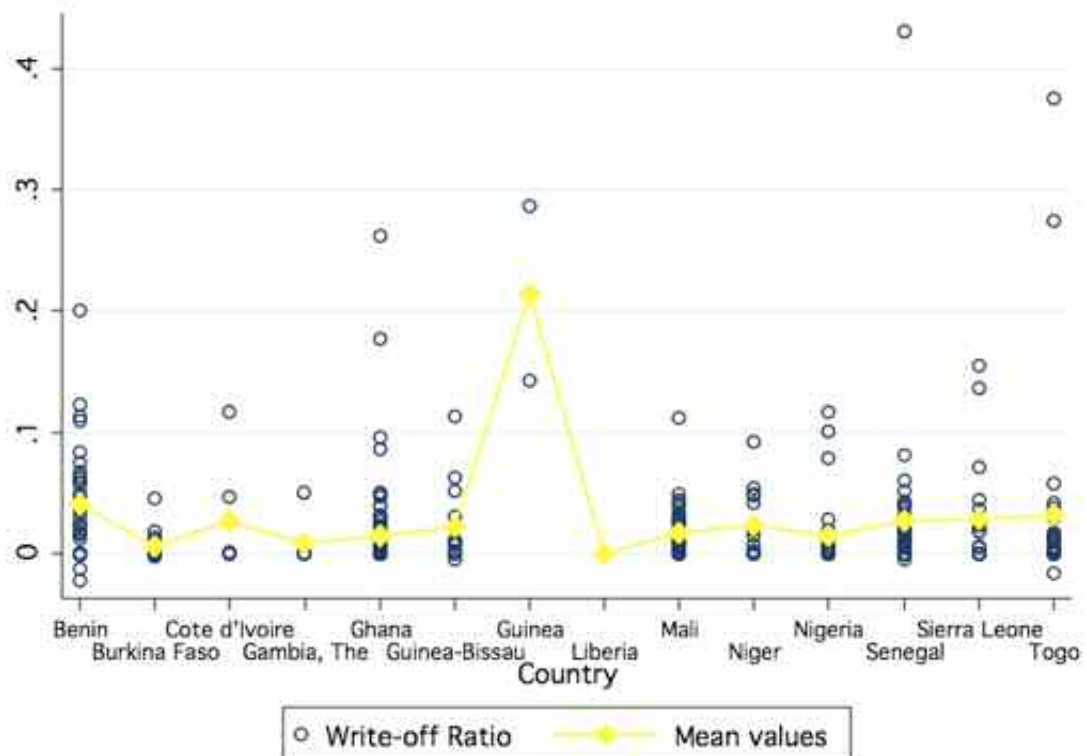
Graph 1.1 Distribution of observations: Portfolio at risk > 30 days



Graph 1.2 Distribution of observations: Portfolio at risk > 90 days



Graph 1.3 Distribution of observations: Write-off ratio



Appendix 2. Correlation matrices

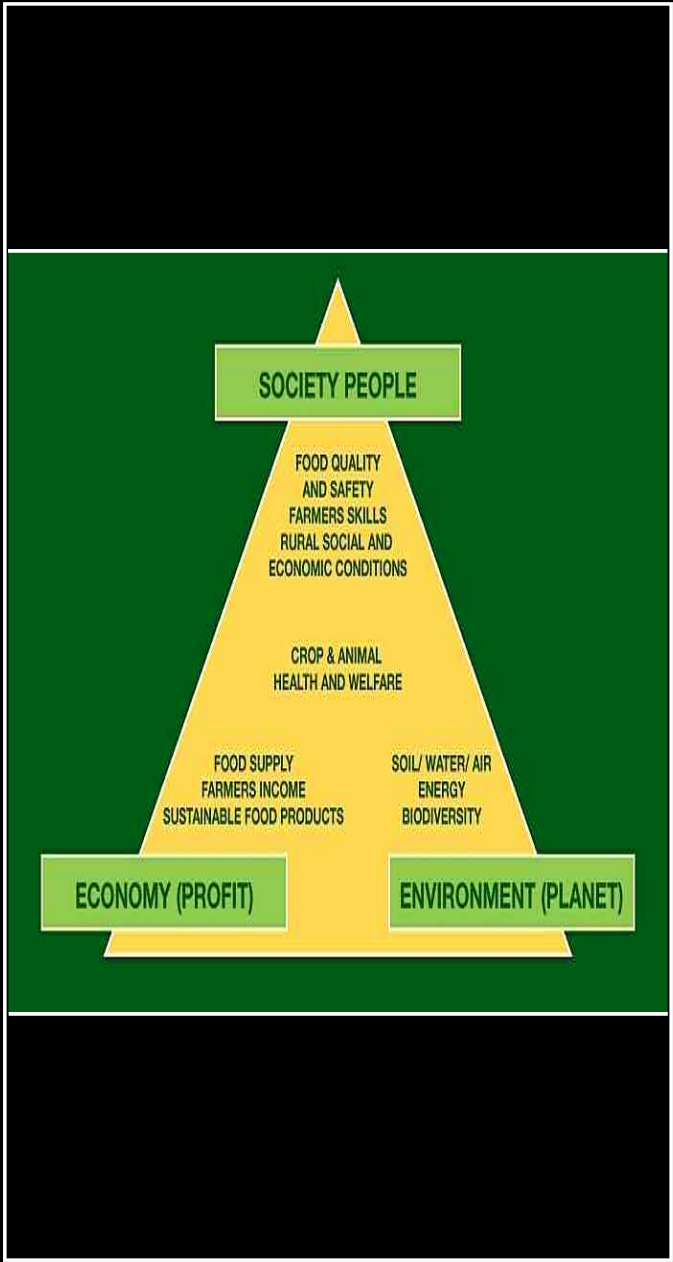
	PAR_30	FEM	LOAN BALANCE TO GNI	SELF SUFFICIENCY	PERSONNEL	FDI	HDI	AMOUNT OF MFI
par-30								
FEM	-0.1416							
Loan Balance to GNI	-0.0115	-0.3243						
Self sufficiency	-0.1832	0.012	0.445					
Personnel	-0.0054	-0.3371	0.1777	0.0213				
FDI	-0.0262	0.1281	-0.0771	0.0531	-0.0766			
HDI	0.1496	-0.0102	0.3051	0.0694	0.0781	-0.0705		
Amount of MFI	0.0589	0.1359	-0.2363	0.1461	-0.0829	0.0413	-0.3379	
Education exp	0.0239	0.084	-0.2656	0.0979	0.0079	0.0028	-0.4718	0.8068

	PAR_90	FEM	LOAN BALANCE TO GNI	SELF SUFFICIENCY	PERSONNEL	FDI	HDI	AMOUNT OF MFI
par-90								
FEM	-0.2185							
Loan Balance to GNI	0.0305	-0.3487						
Self sufficiency	-0.2632	-0.0687	0.0855					
Personnel	-0.0842	-0.3589	0.2013	0.0636				
FDI	-0.0152	0.1841	-0.0941	0.0204	-0.085			
HDI	0.231	0.0483	0.3471	-0.2051	0.0979	-0.0799		
Amount of MFI	-0.0797	0.1337	-0.3097	0.2338	-0.1936	0.0527	-0.3374	
Education exp	-0.1375	0.0809	-0.3454	0.2811	-0.1098	0.268	-0.5604	0.8005

	WRITE-OFF	FEM	LOAN BALANCE TO GNI	SELF SUFFICIENCY	PERSONNEL	FDI	HDI	AMOUNT OF MFI
Write-off								
FEM	-0.1852							
Loan Balance to GNI	0.0677	-0.343						
Self sufficiency	-0.2363	0.0062	0.0378					
Personnel	0.0707	-0.3351	0.191	0.0507				
FDI	0.0178	0.1217	-0.0999	0.0548	-0.0947			
HDI	0.1137	-0.0003	0.3738	0.0391	0.0809	-0.0996		
Amount of MFI	-0.0782	0.1457	-0.242	0.1186	-0.0736	0.078	-0.3556	
Education exp	-0.1219	0.0917	-0.3013	0.0629	0.0077	0.0147	-0.5437	0.7949









3.1 - INDUSTRIAL AGRICULTURE

3.1.1 - HUNGER

AGRICULTURE, THE OVERALL TERM FOR FARMING, RAISING LIVESTOCK, FORESTRY AND FISHING, HAS SUPPLIED LIFE-DEPENDING commodities such as food, clothing and heating material through centuries. In particular in the 1960s, the ‘Green Revolution’ saved many lives with the modern techniques¹ that sparked a huge increase in crop yielding and raised food production from 800 million tonnes to over 2,2 billions tonnes between 1961 and 2000. An estimated one billion people survived the risk of famine thanks to the improved farming methods that also contributed to rural development. However, according to the ‘Save and Grow’ programme by the UN Food and Agriculture Organization’s (FAO), the agricultural success came at a steep price, causing problems today in many rural areas around the world. The intensive yield growth has depleted groundwater, degraded the land and its fertility, polluted the elements, eroded biodiversity and even provoked pest upsurges, with the result of a decline in the much increased yield growth, which threatens future food security. The world population of 2050 will rise to an estimated 9,2 billion but the food levels are not estimated to rise accordingly because of the challenges the farmers are facing with land and water competition, rising prices of fuel and fertilizers and climate changes (FAO, Save and Grow). The switches in weather seasons are making farming unstable in rural areas, which results in low product outcome, further worsening malnutrition problems and moving the achievement of 2015 UN Millennium Development Goals (UN, MDGs) further away, in particular the hunger reduction goal².

Hunger or ‘undernourishment’ is still a real concern for a large part of the world, even though more than enough food is being produced worldwide to feed everyone, close to 870 million people are still suffering from undernourishment; that number equals 1 in 8 people or 12,5 % of the world’s population (FAO, 2012). As shown in figure 1, the vast majority of undernourished people live in developing countries, an estimated 234 million in Sub-Saharan Africa alone (FAO, Hunger)

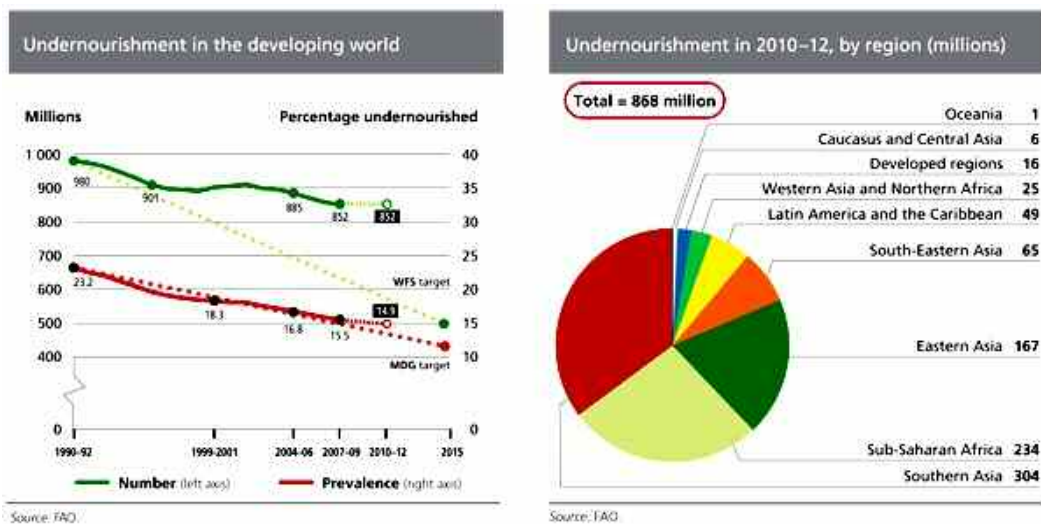


FIGURE 1 (FAO, HUNGER).

3.1.2 - ENVIRONMENT

The environment has paid a huge price for the agricultural advances in the past; figure 2 shows that as much as 80% of tropical deforestation worldwide is due to agriculture, with the largest single driver of deforestation in Africa being fuelwood consumption (Kissinger et al., 2012).

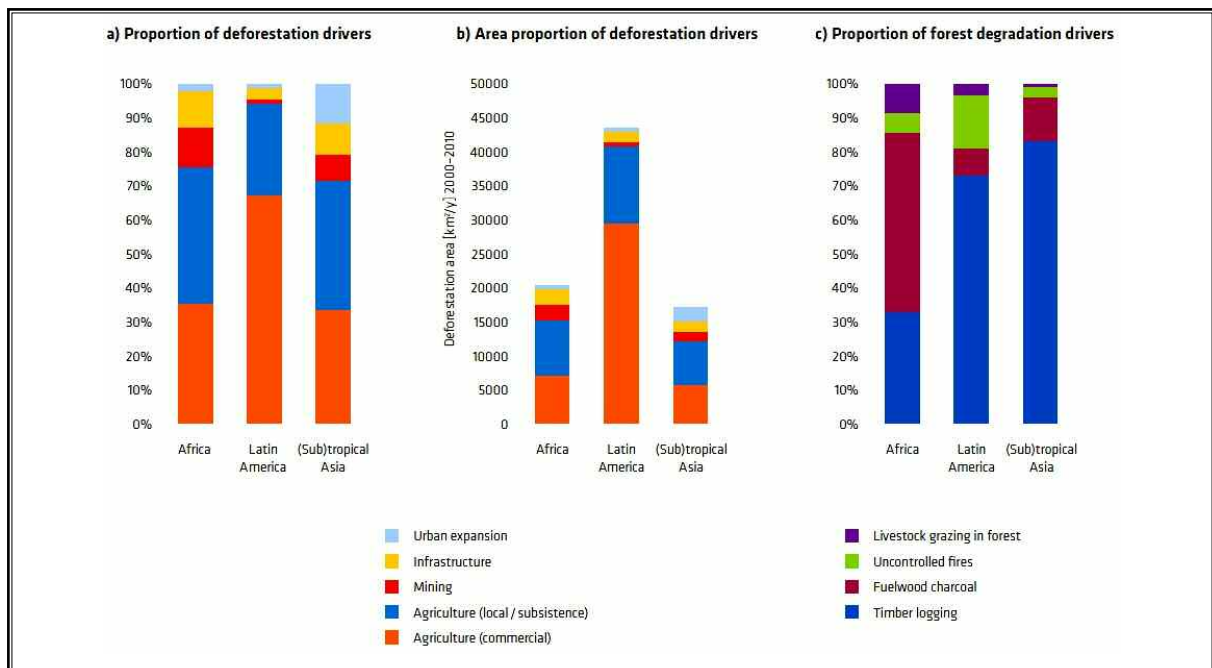


FIGURE 2 (KISSINGER ET AL., 2012).

The cost of industrial agriculture has often been measured in labour alone but the added environmental cost is huge, not to mention the cost of human health and animal welfare. The widespread use of fossil fuels for machinery, agrochemicals and petroleum-based fertilizers, along with the toxic pesticides and herbicides that pollutes groundwater, topsoil and kills bees and birds, are to be taken into consideration when speaking of costs. It is not only the farmers' fields and the surrounding areas that pay the price, nitrogen and phosphorous runoff from conventional farms threatens fisheries, which now experience huge dead zones because of algae blooms; the atmosphere is taking a beating with the greenhouse gasses being released from the nitrogen-based fertilizers (Schiffman, 2012). According to FAO's Climate-Smart programme, agriculture is responsible for 14% of all global greenhouse gas emissions (FAO, Climate-Smart).

The Sustainable Table programme by GRACE informs that industrial agriculture is known to cause topsoil erosion, reducing genetic diversity and polluting air and water. The erosion of soil occurs when the farmers plough extensively and fail to replenish the soil with natural materials, the lack of cover crops and the use of chemicals are adding to the decreasing soil quality (Sustainable Table, Environment).

Genetic diversity is being reduced due to the monoculture crop systems that industrial farms often rely upon, and the usage of genetically engineered crops worsens the problem. Furthermore, industrial farms tend to raise only a few selected breeds of animals, as the main goal is quantity rather than quality and the high amount of animals kept within the same area creates more animal waste and manure than the land can absorb naturally, with the result of high quantities being stored in pits, contaminating the air and the groundwater in the process (Ibid). As an example, a farm with 5.000 hogs can produce as much solid waste as a city of 20.000 humans, but is exempted to have a sewage treatment plan (Walker, 2004). Pollution in the groundwater is also due to the pesticides and fertilizers used for growing the crops more efficiently (Sustainable Table, Environment); according to the US Environmental Protection Agency (EPA), more than two billion tons of pesticides are used every year alone in the US (US, EPA). The use of chemicals is also evident in water resources; the European Environment Agency (EEA) recently reported that over half of the surface water bodies in Europe are in a polluted state, not living up to the desired ecological standards and only 52% is expected to reach good ecological state by 2015 (EEA, 2012).

3.1.3 ~ HUMAN HEALTH

Some of the health issues linked to industrial agriculture have been connected to the use of chemicals, especially pesticides, which has been related to causing cancer, neurological and psychological problems for the consumers, farm workers and those living nearby; especially children are at risk of developing serious illnesses³. Also causing dangerous side effects, are the unsanitary conditions and poor food security that have some times been revealed in both industrial slaughterhouses and factory farms, which have led to widespread epidemics of food-borne illnesses, such as listeria, e.coli and salmonella, causing a great number of deaths worldwide. The widespread use of antibiotics in livestock or 'animal production' does not always slow down the pathogens causing the illnesses; in fact, it often presents more

health risks, increasing the level of antibiotic-resistant bacteria, found in the water, air and soil around the farms and in the food produced. These bacteria pose a great threat to human health as some of them make the human body resistant to the common antibiotics used for minor illnesses, such as penicillin. The antibiotics are administered to livestock to make up for unsanitary, crowded and stressing living situation that would otherwise make them ill. Approximately 80% of all antibiotics sold in the US are for livestock (Sustainable Table, Food & Health).

The decline in soil quality is a general concern for health since the worse the soil gets, the worse the food produced from the soil will be. The nutrients in food products are in decline as high yields and fast growth is increased, lowering numbers in protein, calcium, zinc, selenium, iron, riboflavin and potassium. Few factory farm animals are given pasture and grazing time for exercise and natural diet, which decreases nutrients in the meat while adding higher levels of fat and bad cholesterol. The food they are usually being fed raises health concerns as it contains pathogens – including salmonella, metal compounds, plastic, PCBs⁴ and animal waste that can contain hormones and antibiotics (Ibid). Out of all the new human-illnesses that emerged the last decade, 75% had been caused by pathogens from an animal or animal product, according to the World Society for the Protection of Animals (WSPA).

3.1.4 – ANIMAL WELFARE

Because the focus in industrial farming is on quantity rather than on quality, the animals are considered a product to spark the most amount of income and fed artificial foods containing hormones, pesticides and antibiotics to make them grow faster and bigger; the high number of animals raised together make for very crowded and stressful living conditions. Furthermore, the ways in which the animals are castrated, ‘groomed’ and slaughtered often include painful methods unaccompanied by pain-relieving medicine. Dairy cows often have their horns and two thirds of their tails removed; the piglets have their tails cut short, along with their teeth; chickens raised for laying eggs have up to half of their beak seared off; these procedures result in chronic pain. The unsanitary and toxic surroundings are creating an ideal place for illnesses to spread and are usually found within poultry farming; in the US, only an approximate 1.7% of broiler farms are organic certified, and just 0.44% is reported to be free-range farms; in cattle farming, only 5% of the operations have a thousand or more animals, but the few that do, controls majority of the market with 80-90% of all fed cattle marketing; the top three hog companies own 21% of the sows in the country’s production (Sustainable Table, Animal Welfare).

The restrictions of animals in factory farming hamper their natural behaviour; for instance, pigs are constrained in tight spaces, some of which they are not able to turn around, their natural instinct is to root in dirt and straw, but the bare concrete floors of most industrial farms causes stress, aggression and skeletal deformity in their feet. Approximately half of the pigs in many of these farms have lesions in their lungs due to poorly ventilated confinements. Up to 71% of cattle deaths in the US are due to respiratory illnesses caused by the high amount of dust in the farms (Ibid).

Chickens are kept in unnatural surroundings, heavily restraining their ability to freely move around; an estimated 550-650 cm² per bird is often the requirement, which is approximately the size of a piece of A4 paper. The restricted space can lead to walking problems and the artificial lights, meant to keep the birds awake for longer to eat more and grow faster, causes further leg problems and psychological stress. As a comparison, in 1940 it took approximately 14 weeks for farmed chicken to reach the weight desired before slaughter; today it reaches that same weight in about 5-6 weeks. Another natural process being forced is molting, a process in which the bird stops laying eggs, shed its feathers and re-grow them before starting to lay eggs again. To time manage the molting process, the chickens are sometimes starved for weeks⁵ (Ibid). Industrial raised cattle are primarily given grain-based feed, which is unsustainable as it takes the consumption of approximately eight pounds for the production of one pound of meat; it is also reported that due to high levels of grain diet, 12-32% of cattle develop liver abscesses (Sustainable Table, Livestock).

3.2 – SUSTAINABLE AGRICULTURE

A sustainable agricultural process or product is environmentally friendly and takes both human and animal welfare into consideration, aiming to re-establish the natural renewal cycle and harmonize with nature. The overall goal is to meet the present needs without worsening the possibility of doing the same in the future.

Sustainable agriculture does not only measure success in productivity and yields-per-acre with only labour as the cost, it takes into account the environmental costs and the safety of human health and animal welfare, which can help turn around many of the issues we are facing today. While industrial agriculture seeks to intensify crop production, sustainable agriculture seeks to maintain the water and nutrients in the soil by rotating crops and planting cover crops in the off-season to give the land rest to keep its natural balance and preserve biodiversity. Animals complete the renewal cycle by grassing on the land and the manure functions as fertilizer for the soil - the idea is to give back what is taken and to keep the harming petroleum-based fertilizers away from the soil and groundwater (Sustainable Table, Environment). By combining animals and crop production, the renewal cycle is maintained and both soil depletion

and pollution from excess manure is avoided. This helps saving water resources of which 7% is used in livestock feed for industrial farms; resulting in the use of an estimated 990 litres of water to produce a single litre of milk (WSPA).

Animal health and welfare is considered by allowing pasture time and reducing artificial intakes, whilst only giving antibiotics if the animal is ill, rather than on a continuous basis. Raising fewer animals that functions as a part of the natural cycle on the farm is better for both food quality and welfare (Sustainable Table, Livestock).

Sustainable farming reduces carbon emission when rotating crops and staying clear of pesticides (Isaacs, 2012); it ensures that the most amount of nutrients in the food are preserved by planting fruits and vegetables that are in-season, harvesting them close to complete ripeness and by transporting them shorter distances, rather than the industrial process of harvesting before ripeness only to artificially ripe them, causing a decrease in nutrients including vitamin C, and to store them for longer transportation (Sustainable Table, Food & Health). FAO emphasizes the importance of biodiversity preservation in the fight against hunger, as it helps rehabilitate the ecosystem and sustain nutritious food for the future (FAO, Biodiversity). Fighting hunger or undernourishment is not only about producing enough food, but also about producing the right kind of food that contains the right nutrients and vitamins (Bioversity International). Sustainable agriculture is significantly more successful in reaching the poor rural areas since many farmers depend on small-scale farming for survival (FAO, 2012), and it is more successful in maintaining and protecting the environment for future growth and harvest as growing crops in a sustainable fashion protects the soil from depletion; according to the Save and Grow programme by FAO, yields-per-acre is currently in decline due to poor soil quality (FAO, Save and Grow).

Sustainable farms are required to uphold standards and to continuously prove that their methods are sustainable, if industrial farms were held equally responsible and accountable for environmental impacts, the business would soon lose its economical viability and possibly look towards more sustainable methods (Isaacs, 2012). The WSPA proposes that financial support, such as unseen subsidies, for industrial agriculture should end, in order to make sure sustainable and more humane methods are being prioritised (WSPA).

3.3 ~ CASE STUDY: SIERRA LEONE

Ten years since the eleven-year brutal civil war ended in 2002, the sub-Saharan country ranks 180 out of 187 on the development index of the 2011 Human Development Report (HDR, 2011). One of the reasons the country was vulnerable to a long-lasting civil war, was the uneasiness amongst the young people unable to find jobs to earn a living; the country is still struggling with this issue today. Although the unemployment rate has improved over the last few years⁶, the current rate, set by the African Economic Outlook (AEO, 2012) at 60%, is still high. Considering that the majority of the population falls into the youth category, with the median age of 19,1 years (CIA, The World Factbook), the youth unemployment rate is even more significant.

The Africa Economic Development Institute (AEDI) has estimated that 44% of all post-civil war countries return to conflict again within just five years. Even though this has not been the case in Sierra Leone, the country is still suffering from some of the same issues that sparked the civil war. The Government has acknowledged the importance of creating a safer environment for the youth to speak and to deal with the issues they face in the employment sector: a vital instrument has been the establishment of the National Youth Commission in December 2009, aiming to empower and develop the youth, integrate them into the economy, provide policy oversight and, in general, to ensure that the issues get the attention they deserve (Sierra Leone Government (SLG)) (UNDP).

Two-thirds of the population is engaged in subsistence agriculture (US Department of State, 2012); most are female, 52,2% in comparison with 47,8% male, yet it is the men who dominate the 'paid and self-employed' category, while women often fall into the 'unpaid family workforce' category (NSADR, 2009); women are also the least educated in the country (Spanda Foundation, 2011).

A development of the agricultural area would help in solving the country's unemployment issues along with the malnutrition problems. Most of the country's population lives in rural farming areas, which means that the majority of the population is without or have limited access to education, food and work, providing them with better living conditions could boost the development and prosperity. It is estimated that 66,4% of the population live below the national poverty line⁷ (HDR, 2011).

Even though the agriculture sector is the country's largest contributor to GDP⁸ – measured at 61,5% of total output in 2010⁹ – and it is employing the majority of the labour force, it is still far from being sufficient in feeding the population (AEO, 2012). Thanks to the tropical climate and the large amounts of rain, rice is the most popular crop and is grown by 80% of the farmers; however, almost a third of all rice consumed is still imported, as the national self-sufficiency level is estimated at 69% (PRSP II, 2007). The lack of self-sufficiency proves the need for development in this sector; crop growing is suffering from limited means and almost no up-to-date methods. Tractors, machineries and fertilizers are needed to increase the yields-per-acre and to produce more food, which is becoming increasingly important as the population continues to grow at high speed; it has doubled in the last fifty years (Spanda Foundation, 2010). The National Sustainable Agriculture Development Plan (NSADP) reports the growth rate to be 2,1%, which means that the population is doubled approximately every 34 years, according to the National Sustainable Agriculture Development Plan (NSADR, 2009).

The rapid growth in population has led to an expansion in agriculture, which has caused a higher degree of soil depletion, while slash-and-burn-farming, cattle grazing and lumbering are destroying the forests; these actions will only contribute to problematic environmental changes (Ibid).

Fishery is very important for the country; an average household gets 75-80% of their protein intake from fish, making the national average consumption per capita 23,5 kg¹⁰ in comparison to the global average of 15 kg (NSADP, 2009). Over-fishing is practised as an ongoing attempt to feed the growing population, which in the long run could be devastating for the renewal of fish (Spanda Foundation, 2010). Another factor that threatens farming and fisheries is the lack of infrastructure, which affects transportation, markets, feed and rice mills, irrigation systems, rural roads, landing sites and sea and inland ports. Until now, better farming technologies have not been affordable because of the low economic return from commodities. A development in infrastructure would help the growth of agriculture and raise the economic activity in the rural areas (Spanda Foundation, 2011).

It is important to develop and maintain sustainability in the agricultural sector, as agriculture is the country's greatest source of labour and production. One of the ways to further the development of sustainable agriculture would be to improve weather forecasts and predictions of climate changes as many farmers in the country no longer have the confidence in their timing of planting crops because environmental changes have resulted in a switch of patterns in the wet and dry seasons, making it difficult for them to predict the outcome of their harvest (Spanda Foundation, 2011). Other environmental changes that are making crop production difficult include strong winds, flooding, thunderstorms, landslides and higher temperatures (Spanda Foundation, 2010).

Rather than receiving conventional education, children are often prompted to farm on school grounds where the teacher collects the crops and then bring home-cooked food for the children to buy; in fact, a great part of the school year is passed with non-teaching activities such as farming and sports. The farming experience gained at the schools will arguably help the children in the future as the majority are likely to become farmers, but the lessons acquired are not about sustainable methods and conventional education is needed for social development (Spanda Foundation, 2011). With sustainable agriculture and higher food levels, there would be no need for children to be farming during their school hours. Being able to afford land would also mean an increase in social status, as landowners have superiority over non-landowners in the Chiefdoms¹¹ (Spanda Foundation, 2010).

3.4 - CURRENT PROGRAMMES AND DEVELOPMENT

Since the civil war the Government has given priority to the agricultural sector, recognized it as a key component in poverty reduction and economic growth (PRSP II, 2007) and put in motion several programmes to tackle the issues. The NSADP is the country's follow-up plan to the PRSP II, which seeks to further strengthen agriculture, energy and infrastructure and acts as a compact of the Comprehensive Africa Agriculture Development Programme (CAADP)¹², aiming at eliminating poverty, hunger and food insecurity through agricultural-based development, and to expand exports and economic growth (CAADP).

The West Africa Agricultural Productivity Program (WAAPP) is a regional programme for the members of the Economic Community Of West African States (ECOWAS) to boost agricultural production and promote regional technology and knowledge sharing. One of the goals of the regional collaboration is to further strengthen the political peace among the neighbour countries (WAAPP). The programme is approved and funded by The World Bank and further specific funding is given to 'The Manu River Union customs union, which includes Sierra Leone, Liberia, Guinea and Cote d'Ivoire (International Institute for Sustainable Development (IISD)).

Another World Bank project is the Rural Private Sector Development Project (RPSDP), aimed specifically at Sierra Leone to improve domestic market access and to promote agricultural export (RPSDP), it is expected that the project will rehabilitate feeder roads and create local jobs, as well as increase household incomes (AEO, 2012).

A more centralized initiative is the Sustainable Nutrition and Agriculture Promotion (SNAP) programme by ACIDI/VOCA¹³, aimed at reducing malnutrition of young children and enhancing livelihoods for women and youth in particular. It is carried out by educating mother-children units on nutrition and health, and by handing out food rations, along with providing farmers with training in agricultural production methods and techniques for handling harvested crops, while taking gender roles into account (SNAP, 2012).

A green energy project by Addax Bioenergy¹⁴, the Makeni Ethanol and Power Project (MEPP)¹⁵ is currently under development. MEPP includes a biomass power plant, the development of a sugarcane plantation, an ethanol refinery and related infrastructure. These components will be dependant on one another: the irrigation system for the plantation and the ethanol refinery will be supplied with electricity from the biomass power plant, which in return will be fuelled by sugarcane residue. Addax Bioenergy has reported that 1200 people are already employed in the project and the creation of more than 2000 jobs is expected in the future. Furthermore, some of the electricity from the power plant will go to the national grid, improving energy access in the country (MEPP).

Another initiative, the UN World Food Programme (WFP), helps small farm-holders getting their production to reach a sustainable state, by providing food assistance and technical supervision (WFP, 2012). In an effort to move further

on than subsistence farming, the Government is working together with FAO to provide better access to machineries, fertilizers and seeds and developing financial and marketing skills, as well as promoting development to infrastructure and irrigations systems (FAO, 2011).

3.5 – CONCLUSION

Forests, soil, water, air, land and animals are all suffering from unsustainable measures taken and affects human health, so to measure the input of agriculture with only labour is not sufficient when the other costs are threatening future welfare, to continue on this path it is neither efficient nor sustainable. The way agriculture has been conducted in the past and presently in industrial farming, is not sustainable and will not secure food-levels for future generations. In industrial agriculture no concerns are given to the damage the artificial and toxic chemicals are inflicting and the disregard for animals and their natural ability to restore the renewal cycle is harming for both health and environment.

Because sustainable agriculture works in harmony with nature and focuses on the natural cycle of the environment and the health of the soil, it is far more effective at achieving food-security and restoring balance to the violated nature. It also treats animals better by not reducing them to a mere product for economical gain but making them a part of the renewal cycle that will ensure a healthy soil for crop plantation, which increases human health. In conclusion, sustainable agriculture is the only way to secure future generations from struggling to maintain good environmental conditions and healthy diet.

As most of the population in Sierra Leone live in rural farming areas and the majority of these are poor and undernourished, developing sustainable agriculture and focusing on educating in the process would contribute to both poverty reduction and higher food levels; it would also help the development of economy, environment and education. An increase in successful crop production would open domestic market and international export possibilities, making the future more sustainable and prosperous for the country. In conclusion, focusing on sustainable agriculture in Sierra Leone would positively affect environmental, economical and social development (the Triple Bottom Line), making it a good starting point for increasing the prosperity and welfare of the country and its population.

¹ The modern techniques at the time included crop varieties that are high-yielding, agrochemicals, irrigation systems and improved management (FAO, Save and Grow).

² GOAL 1, Target 1.C: “Halve, between 1990 and 2015, the proportion of people who suffer from hunger” (UN, MDGs: 1).

³ Illnesses in children that have been linked to pesticide use includes disruptions to the reproductive, endocrine and immune systems, delayed development, cancer and other organ damages (Sustainable Table, Food & Health).

⁴ PCBs: Polychlorinated biphenyls, a highly toxic industrial chemical that is formed by adding chlorine to biphenyl. According to the UN’s Environment Programme (UNEP), Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), PCB exposure can cause liver illnesses and even death (unep, gpa).

⁵ In the US in 1999, it was estimated that 75-80% of all hens had undergone forced starvation (Sustainable Table, Animal Welfare).

⁶ The Government’s second Poverty Reduction Strategy Paper (PRSP II) reported youth unemployment to be 70% in 2007 (PRSP, 2007).

⁷ The national poverty line of Sierra Leone is set at 2,111 Sierra Leonean Leones (SLL) per day (PRSP II, 2007), which equals just under 0,5 US\$. The percentage of people living below the international poverty line of 1,25 US\$ a day, reported on the recent Human Development Index, is estimated to 53,4% (HDR, 2011). The numbers of the national and the international poverty line do not correlate, making it difficult to give an exact percentage of people living in poverty as it ranges between 50-70% depending on which report or statistic is being used.

⁸ It is predicted that the mining sector will be the dominant actor in GDP growth in the following years. Thanks to a newly discovered 10,5 billion tons of high-grade iron ore deposits, the sector is expected to boom and make Sierra Leone one of the largest iron ore producers in Africa by 2015 (AEO, 2012).

⁹ The exact percentage of GDP is hard to determine as the output is measured differently in each report on the subject. From 2007-2010, the percentage has been measured between 46% and 61,5% (NSADP) (AEO, 2012).

¹⁰ The average consumption is not evenly distributed as geographical and seasonal variations do not allow it (NSADP).

¹¹ Chiefdoms represent the former traditional political system of the country. They are often characterized by centralized authority and inequality. The Paramount Chief is in charge, presiding over the Council, which consists of Town Chiefs and Section Chiefs. In most Chiefdoms, the Paramount Chief can only be a person from a ‘ruling family’, and is elected by a small pool of ‘chieftaincy families’ (Spanda Foundation, 2010).

¹² CAADP is led by African governments, as a programme of the African Union (AU); it aims to raise agricultural productivity by at least 6% each year (CAADP).

¹³ ACDI/VOCA is a merging, from 1997, between two non-profit international economic development organizations: Agricultural Cooperative Development International and Volunteers in Overseas Cooperative Assistance (ACDI/VOCA).

¹⁴ Addax Bioenergy is a subsidiary of the Swiss-based Addax and Oryx Group (AOG).

¹⁵ Also referred to as The Addax Bioenergy Sierra Leone (ABSL) project; it has received critique for not having sufficiently informed the owners of the land they have leased for the sugar plantation, and for not creating job securities and raising livelihoods (Oakland Institute, 2011).

R E F E R E N C E S

- ADDAX AND ORYX GROUP (AOG). (2012). <http://www.addax-oryx.com/uk/> (accessed November 28, 2012).
- AFRICA ECONOMIC DEVELOPMENT INSTITUTE (AEDI). (2012). *Sierra Leone Youth Unemployment*, http://africaecon.org/index.php/africa_business_reports/read/53 (accessed on November 12, 2012).
- AFRICAN ECONOMIC OUTLOOK. (2012). *Sierra Leone 2012*. <http://www.africaneconomicoutlook.org/fileadmin/uploads/aeo/PDF/Sierra%20Leone%20Full%20PDF%20Country%20Note.pdf> (accessed November 14, 2012).
- AFRICAN UNION (AU). (2012), <http://www.au.int/> (accessed November 29, 2012).
- AGRICULTURAL COOPERATIVE DEVELOPMENT INTERNATIONAL AND VOLUNTEERS IN OVERSEAS COOPERATIVE ASSISTANCE (ACDI/VOCA). (2012). <http://www.acdivoca.org/site/ID/home> (accessed November 28, 2012).
- BIOVERSITY INTERNATIONAL. (2012) *Nutrition*, <http://www.bioversityinternational.org/research/nutrition.html> (accessed December 12, 2012).
- CENTRAL INTELLIGENCE AGENCY (CIA). The World Factbook. *Sierra Leone*. <https://www.cia.gov/library/publications/the-world-factbook/geos/sl.html> (accessed November 14, 2012).
- COMPREHENSIVE AFRICA AGRICULTURE DEVELOPMENT PROGRAMME (CAADP), <http://au.int/pages/caadp> (accessed November 29, 2012).
- ECONOMIC COMMUNITY OF WEST AFRICAN STATES (ECOWAS). *ECOWAS, Member States*, <http://www.ecowas.int/> (accessed November 28, 2012).
- EUROPEAN ENVIRONMENT AGENCY (EEA). (2012). *European waters – assessment of status and pressures*, <http://www.eea.europa.eu/publications/european-waters-assessment-2012> (accessed December 7, 2012).
- FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO). (2011). *Moving beyond subsistence farming in Sierra Leone*, <http://www.fao.org/news/story/en/item/52423/icode/> (accessed November 29, 2012).
- . (2012). *Biodiversity: for a world without hunger*, <http://www.fao.org/biodiversity/en/> (accessed December 12, 2012).
- . (2012). *Climate-Smart Agriculture: for development*, <http://www.fao.org/climatechange/climatesmart/en/> (accessed December 4, 2012).
- . (2012). *Hunger*, <http://www.fao.org/hunger/en/> (accessed October 18, 2012).
- . (2012). *Save and Grow: A Policymaker's Guide To The Sustainable Intensification Of Smallholder Crop Production*. <http://www.fao.org/ag/save-and-grow/> (accessed December 3, 2012).
- . (2012). *The State of Food Insecurity in the World*. <http://www.fao.org/docrep/016/i3027e/i3027e.pdf> (accessed October 19, 2012).
- HUMAN DEVELOPMENT REPORT. UNITED NATIONS DEVELOPMENT PROGRAMME (HDR). (2011). *Human Development Report 2011: Sustainability and Equity: A Better Future for All*. http://hdr.undp.org/en/media/HDR_2011_EN_Complete.pdf (accessed November 12, 2012).
- INTERNATIONAL INSTITUTE FOR SUSTAINABLE DEVELOPMENT (IISD). *Six New Countries Join West Africa Agricultural Productivity Program*, <http://africasd.iisd.org/news/six-new-countries-join-west-africa-agricultural-productivity-program/> (accessed November 28, 2012).
- ISAACS, J. R. (2012). *Organic farming keeps carbon out of the atmosphere*, <http://news.mongabay.com/2012/1128-isaacs-organic-carbon.html> (accessed December 12, 2012).
- KISSINGER, G., M. HEROLD AND V. DE SY. (2012). *Drivers of Deforestation and Forest Degradation: A Synthesis Report for REDD+ Policymakers*. <http://www.decc.gov.uk/assets/decc/11/tackling-climate-change/international-climate-change/6316-drivers-deforestation-report.pdf> (accessed October 25, 2012).
- MAKENI ETHANOL AND POWER PROJECT (MEPP), <http://www.addax-oryx.com/uk/> (accessed November 28, 2012).
- NATIONAL SUSTAINABLE AGRICULTURE DEVELOPMENT PLAN 2010-2030 (NSADP). (2009), http://typo3.fao.org/fileadmin/user_upload/fsn/docs/NSADP_CAADP_discussion_paper_for_Compact_double_sided.pdf (accessed November 15, 2012).
- OAKLAND INSTITUTE. (2011). *Understanding Land Investment Deals in Africa*, http://www.oaklandinstitute.org/sites/oaklandinstitute.org/files/OI_Addex_Brief.pdf (accessed November 29, 2012).
- POVERTY REDUCTION STRATEGY PAPER II (PRSP II). (2007). *An Agenda For Change: Second Poverty Reduction Strategy 2008-2012*, http://unipsil.unmissions.org/portals/unipsil/media/publications/agenda_for_change.pdf (accessed on November 14, 2012).
- RURAL PRIVATE SECTOR DEVELOPMENT PROJECT (RPSDP). <http://www.worldbank.org/projects/P096105/rural-private-sector-development?lang=en> (accessed November 28, 2012).
- SCHIFFMAN, R. (2012). *Only Organics Can Feed the Hungry World: Here's Why*. <http://truth-out.org/opinion/item/12018-only-organics-can-feed-the-hungry-world-heres-why> (accessed November 1, 2012).
- SIERRA LEONE GOVERNMENT (SLG). (2012). *The APC Manifesto 2012: Transformation for National Prosperity*, <http://www.state-house.gov.sl/index.php/component/content/article/34-news-articles/573-the-apc-manifesto-2012-transformation-for-national-prosperity> (accessed November 12, 2012).
- SPANDA FOUNDATION. (2010). *Moving On: Sierra Leone Report 2009*. (The Hague: Spanda Publishing).
- . (2011). *A Mantra for a Green Earth*. (The Hague: Spanda Publishing).
- SUSTAINABLE NUTRITION AGRICULTURE PROMOTION (SNAP). (2012), [http://www.acdivoca.org/site/Lookup/SierraLeone-SNAP/\\$file/SierraLeone-SNAP-USAID-branding.pdf](http://www.acdivoca.org/site/Lookup/SierraLeone-SNAP/$file/SierraLeone-SNAP-USAID-branding.pdf) (accessed November 27, 2012).

- SUSTAINABLE TABLE. *Animal Welfare*, <http://www.gracelinks.org/274/animal-welfare> (accessed December 10, 2012).
- . *Environment*, <http://www.gracelinks.org/265/environment> (accessed December 10, 2012).
- . *Food and Personal Health*, <http://www.gracelinks.org/271/food-personal-health> (accessed December 10, 2012).
- . *Sustainable Livestock Husbandry*, <http://www.gracelinks.org/248/sustainable-livestock-husbandry> (accessed December 12, 2012).
- UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP). *National Youth Commission Strategic Plan, 2012-2016*, http://www.sl.undp.org/5_jobs/TOR_strategic_planIC_Aug%202011.pdf (accessed November 12, 2012).
- UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP), Global Programme of Action of the Protection of Marine Environment from Land-based Activities (GPA). *PCBs*, http://www.chem.unep.ch/gpa_trial/19pcbs.htm (accessed December 11, 2012).
- UNITED NATIONS MILLENNIUM DEVELOPMENT GOALS (MDGs). *Goal 1: Eradicate Extreme Poverty and Hunger*. <http://www.un.org/millenniumgoals/poverty.shtml> (accessed December 6, 2012).
- US DEPARTMENT OF STATE. (2012). *Sierra Leone*, <http://www.state.gov/outofdate/bgn/sierraleone/194935.htm> (accessed November 16, 2012).
- US ENVIRONMENTAL PROTECTION AGENCY (US, EPA). *The EPA and Food Security*. <http://www.epa.gov/pesticides/factsheets/security.htm> (accessed October 10, 2012).
- WALKER, P. AND R. LAWRENCE. (2004). “American Meat: A Threat to Your Health and to the Environment” in *Yale Journal of Health Policy, Law, and Ethics (IV):1*, <http://awellfedworld.org/PDF/American%20Meat%20A%20Threat.pdf> (accessed October 15, 2012).
- WEST AFRICA AGRICULTURAL PRODUCTIVITY PROGRAM (WAAPP). <http://www.worldbank.org/projects/P117148/west-africa-agricultural-productivity-program-apl-waapp-1b?lang=en> (accessed November 28, 2012).
- WORLD FOOD PROGRAMME (WFP), <http://www.wfp.org/> (accessed November 29, 2012).
- . (2012). *In Sierra Leone farmers rehabilitate their lands*. <http://www.wfp.org/stories/sierra-leone-farmers-rehabilitate-their-lands> (accessed November 29, 2012).
- WORLD SOCIETY FOR THE PROTECTION OF ANIMALS (WSPA). *Why livestock and humane, sustainable agriculture matter at Rio+20*. http://www.wspa-international.org/Images/Policy%20doc%20-%20Why%20livestock-Final-sm_tcm25-21763.pdf. (accessed December 11, 2012).





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