

# Food Security and Livelihood of Rural Households of Songololo Territory in Kongo Central Province, Democratic Republic of the Congo

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**Abstract:** The survey was conducted from May to July 2012 on security, food consumption and livelihoods of 172 rural households in three administrative districts of Songololo territory, located about 200 km to the West of Kinshasa. From these investigations, we considered several food insecurity indicators namely the determining access scale household food insecurity and the household dietary diversity score. Data analysis showed that food security in a rural area highly depends on the socio-demographic and economic profile of the household head, the level of education, the facilities, the gender, the livelihood used, henceforth the need to know the household profile of these households. Songololo rural household food access is mainly done through their own agricultural production (physical access), buying from the small rural local market or through the sale by means of labor power (economic access). The more educated is the household head, the more the household is well equipped and high is the food diversity, therefore the chance is less to face food insecurity. Moreover, households headed by men vary their source of income outside of agriculture are less affected by severe food insecurity (25%) than households headed by women (50%). Last, more a household is searching for strategies of living less it is affected by food insecurity.

**Keywords:** Food Security, Dietary Diversity Score, Rural Households, Livelihood, Socio-economic Profile, Kongo Central, Songololo, DRC

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## 1. Introduction

Livelihood insecurity is a *re*-emerging issue in rural development. In the 1980s, the food security literature tried to identify cyclical and acute food insecurity (seasonality and famine respectively) as main features of rural poverty in tropical regions [18]. Food insecurity The hungry, poor and victims of food insecurity often produce food and practice farming on small plots of land. Sometimes, they rear animals and do what they can to feed their families and sell their

products in local markets but they barely own their own land [1] that makes that only very few people can collect all their income from only one source, hold all their wealth as any single asset or use their assets just in one activity only [20]. Although in recent decades, poverty has declined in certain regions of the world around 1.9 billion people still live in extreme poverty. Approximately 780 million people are undernourished worldwide and thus live in developing regions. South Asia has the highest number of rural poor, and Sub-Saharan Africa, where the incidence of rural poverty is

high, and these regions are really hit by poverty and hunger [1] and it is also where the food security lost its definition. Thus, food security may be defined when all people, at all times have physical and economic access to sufficient, secure and nutritious food in order to meet their dietary needs and food preferences for an active and healthy life [21-22]. The Democratic Republic of the Congo (DRC) is not spared to this global scourge. About 70% of Congolese live in rural areas and 90% of national agricultural production is provided by the family farm peasantry [2]. Agriculture is the staple activity of 92.6% of rural households and contributes to 64.4% of the food consumption of rural households [3].

In DRC, poverty affects over 70% of the population, of which 46.5% are in extreme poverty, particularly in rural areas and nearly 80% of the rural population lives on less than one US dollar a day. In fact, about 30% of the population eats once a day and 60% do not eat more than twice a day, mostly monotonous meal of cassava roots and leaves. Chronic malnutrition is most acute in rural areas (43%) than urban areas (29%), with no significant gender differences. And almost 73% of the population lives with food insecurity, the situation remains very worrying for rural households in DRC [4, 15].

In Songololo, the population is more rural than urban. To meet their basic needs, most (87%) of rural household heads of Songololo practice agriculture as their main income generating activity and 13% is engaged in other activities, including small business, crafts, fishing, hunting, harvest, and wage labor. Chicken farming is the most spread of all types of farming

practiced in Songololo. Though at a low scale, the rearing of goats and sheep constitutes savings and hardly used for household consumption. The power of households is mainly based on the consumption of vegetables and tubers often harvested in the field, in the forest and/or purchased on the local market. The meat is rare in the plates of rural households in Songololo and it is due to the higher purchase price compared to the low income of less than one US dollar (US \$ 0.39) per capita/day [2, 5-6]. Therefore, the main source of animal protein is exclusively from imported mackerel fish. This study aims to know the socio-demographic and economic profile of rural households in the territory of Songololo vulnerable to food insecurity, but also to identify their livelihoods.

## 2. Material and Methods

### 2.1. Study Area

Songololo territory extends from 5° 45' South and 14° 02' East and has a covering area of 8 507 km<sup>2</sup>. It is the largest territory of Kongo-Central [7], three times larger than Luxembourg in the surface term. It is limited to the east by the territory of Mbanza-Ngungu, to the west by the city of Matadi and the territory of Seke-Banza, to the north through the territory of Luozi and to the south by Zaire province in Angola [6]. With a population of 232 858 inhabitants and a density of 26 hab./Km<sup>2</sup>, the territory Songololo is made of 5 administrative districts, 13 groupings, 510 villages and two cities [8]. The location of the study area is shown in Figure 1.

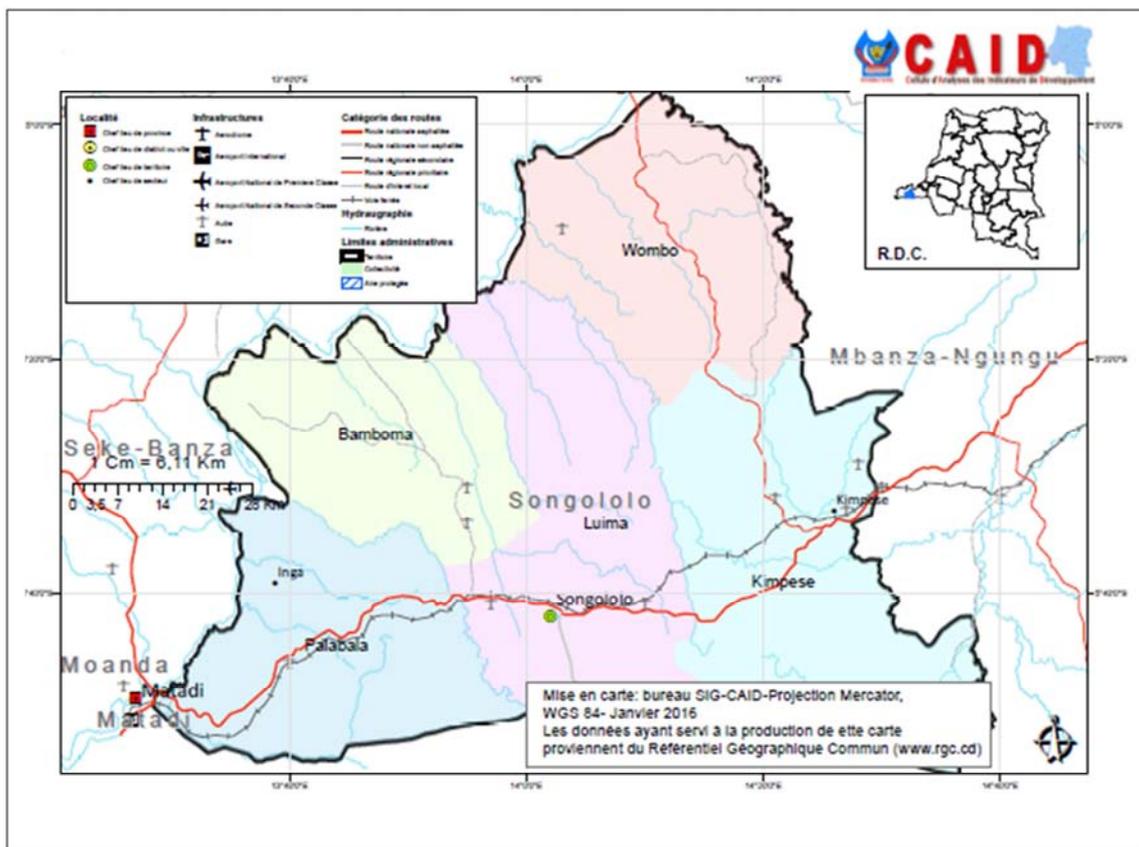


Figure 1. Administrative map of Songololo territory.

The vegetation is diverse. We can find fragments of colonizing rupicolous forests, aquatic forests, marshy, grassy steppes and secondary forests commonly known as "Nkunku" located around villages, in order to protect the villages from wildfire as well as provide edible fruits and firewood. But under human action, forests are being replaced by savannas of *Chromoleuna odorata*, *Imperata cylindrica*, *Mucuna pruriens* and other grasses [9]. The relief consists of plains and plateaux through the hills. The most famous mountain is the mountain crystal "Mongo a bangu." Several rivers irrigate the territory of which are emblematic: Mpozo, Sanzikwa, Kwilu, Lunionzo, Lungezi and Lufu.

As for the climate, Songololo is located in the tropical climate type AW according to Koppen classification with two seasons [10] and a long rainy season between 7 and 8 months i.e between September/October and April/May. The soil is sandy clay, fragile and infertile [11] conducive to perennial and food crops. It has precipitations of an average height of 130 mm, with a maximum exceeding 200 mm. The annual average rainfall varies between 900 mm and 1500 mm. Moreover, the average annual temperature hovers around 25°C. The sunshine is particularly low around 50% between 7 and 17 hours [12].

## 2.2. Investigation

The fieldwork was conducted using a questionnaire adapted from questionnaires on food consumption diversity (FAO) and wide access to household food insecurity in order to know the profile of rural households in the territory of Songololo vulnerable to food insecurity, describe their diet and at last identify their livelihoods. The study was conducted in the three administrative districts of the territory of Songololo (Kimpese, Luima and Pala bala) and it covered 172 rural households. The sample is based on a draw at three levels (district, village and household). The sample size was distributed in proportion to the demographic weight. The technique used to collect data was a direct interview with the head of household, his wife and other members of the household present on the day of the survey.

The survey was based on the identification of the household head, household composition, description and location of housing, socio-economic profile, the wealth index or household assets, the food consumption score, food diversity, measuring the scale of determining access to household food insecurity and livelihoods. Data were recorded using Epi data 3.0 that were exported to SPSS 19.0 and Microsoft Excel 2013 for processing by sorting flat and folded, production of tables of results following the absolute and relative frequencies (%) of basic statistical characteristics and graphics.

## 3. Results and Discussion

### 3.1. Profile of Songololo Rural Households

The food security of rural households is heavily reliant on

household socio-economic and physical conditions, henceforth the need to comprehensively describe the profile of the surveyed households. The access of rural households to food, is mainly through their own agricultural production (physical access), help from relatives and friends, but also in buying from the small rural market (economic access) or through the sale of labor power, commonly called "coup de main or Djimea" in Songololo where the person is paid and can afford food (economic access). Nevertheless, the exchange for food is also possible by selling the labor power (physical access).

We note that in rural areas, agriculture and related activities cover most of the food and non-food requirements of households.

The socio-economic variable of the rural household head in Songololo is presented in Table 1.

*Table 1. Profile of rural household head in Songololo.*

Variables	Songololo (n=172)
Gender of household head (%)	
Man	78
Woman	22
Education (%)	
Illiterate	04
Primary	18
Secondary	74
University	04
Major activities of households (%)	
Agriculture and related	87
Other activities	13

From the above table, it can be observed that majority of Songololo rural households (78%) is a charge of men, only 22% are led by women. These results go along with the one found by [13] at the national level and [17] for Bas-Congo (Kongo Central) province that 90% and 89% of rural households are in charge of men. As for education, the results in Table I show that illiteracy affects only 4% of heads of households, 17% of men versus 83% of women. In developing countries, illiteracy strikes particularly women. The results corroborate with, who reported that 757 million adults are illiterate in the world of which two-thirds (63%) are women. Thus, 44% of women versus 19% of men are illiterate in DRC. [13] reported that illiteracy affects more women than men, with 67% versus 18% respectively and women in rural areas were the most affected group. Moreover, at the provincial level, only 71.2% of literate (educated) are women cons 28.8% of men. Agriculture is the main activity of subsistence and purveyor of the majority of jobs (87%) of rural households in Songololo cons 93% of rural households at the national level.

### 3.2. The Land Capital

The possession of the land for agricultural practice is an important asset for providing food and non-food needs of rural households. The percentage of ownership of agricultural lands by rural households in the three areas visited is shown in the figure below (figure 2).

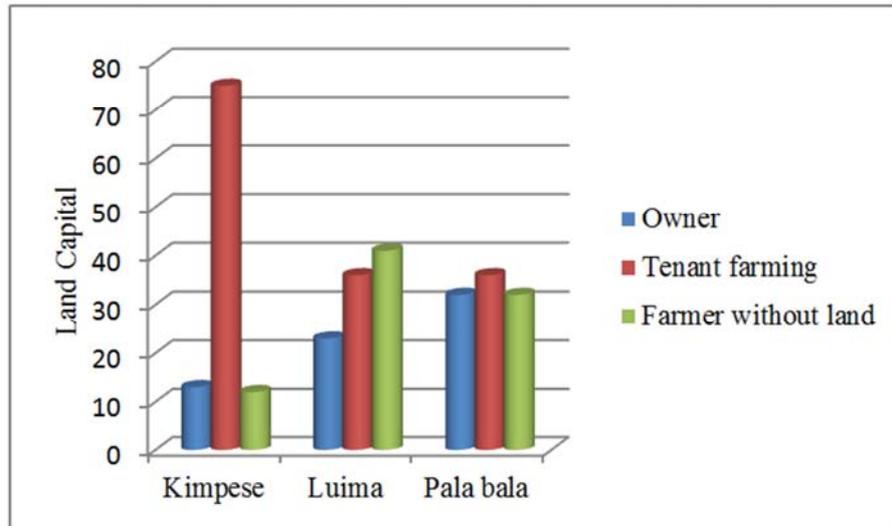


Figure 2. Access to the land capital of households for agricultural practices.

[4] showed that 14% of the rural population of Kongo-Central is tenants of agricultural land and this rate is the most important found at the national level. As it can be observed in the figure above, the agricultural land is held by a minority of farm households either less than a quarter representing 19% (owners). More than three-quarters of surveyed rural households (81%) do not own agricultural lands. Due to the lack of access to land, many households only farm in very small areas of roughly 0.5 ha. [1] reported that people experiencing food insecurity often produce food and practice farming on small plots of land. They rarely have their own land. Furthermore, it should be noted that the problem of food insecurity continued to persist in a country as many rural households have lost their means of livelihoods due to recurrent drought and crop failures [24], knowing that differential access rights to land are often the key determinant of distinct livelihood strategies [19].

**3.3. Level of Wealth of Rural Households of Songololo Per Household Head Gender**

The level of assets of households by the household head gender is given the figure below (figure 3).

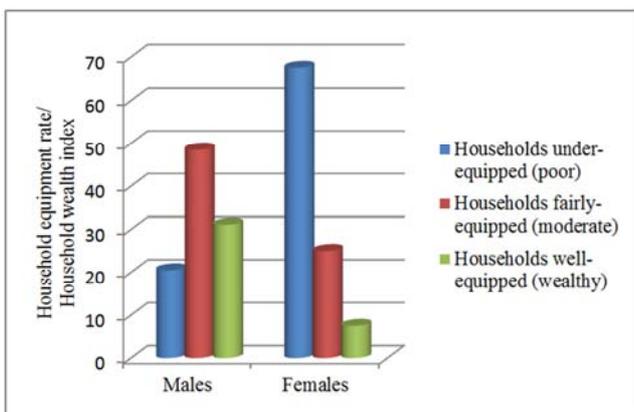


Figure 3. Asset level of households (%) by the household head gender.

Seeing the figure above, in the category of under-equipped households (poor), it can be observed that almost three-quarters of poor households (77%) are headed by women against less than a quarter (23%) of which heads of households are men. Furthermore, more than two-thirds (66%) in the category of moderately equipped households are headed by men against 34% of households whose women are in charge. Last, the majority (81%) of households in the rich or well-equipped category is led by men against less than a quarter (19%) having women as household heads. This confirms the report of [1] that households whose heads are women were poorer than those headed by men.

**3.4. The Number of Meals the Day Before the Survey**

The average number of daily meals taken by surveyed rural households per district and gender of the household head is presented in the table below.

Table 2. Average number of meals per households.

Gender of the household head	Average of meals taken
Man	2.55
Woman	2.36
Overall Average	2.49

The results given in the table above show that rural household of Songololo consumed on average 2.49 meals per day per household the day before the survey. But several reasons can be the cause of this phenomenon, of which rural households headed by men have had on average more activities (1.55) against those headed by women (1.21). Then, rural households headed by women have an illiteracy rate of 83% against only 17% for those headed by men. In the end, households headed by women have a level of sub-equipment of 77% against those headed by men (23%). Although the average meal in Songololo seems to be slightly higher than the national average, this finding goes along with [1].

### 3.5. Households Food Diversity Score

#### 3.5.1. Classification of Households into Three Levels of Food Diversity Score

The classification of household diet in three levels of food

diversity was made, considering an average score of food diversity in 6 food groups. Data analysis reveals that 73% of rural households of Songololo have a diverse diet with 51% of them have a high food diversity (score > 6) and 22% moderately diverse diet (score = 6).

**Table 3.** Diet Classes diet according to the score of food diversity of households consumed at least in half of the households.

Variables	Low food diversity (<6)	Middle food diversity (=6)	High food diversity (>6)
Number of concerned households	46 (27%)	37 (22%)	88 (51%)
Mean and standard deviation Household food diversity score	4.6±0.7	6±0.0	7.5±0.8
Food Group	Roots and tubers	Roots and tubers	Cereals
	Oils	Fish	Roots and tubers
	Vegetables	Legumes	Fish
		Oils	Legumes
		Vegetables	Oils
			Vegetables
		Sugar	

The household classes made from the food diversity score show averages of 4.6, 7.5 and 6 food groups respectively. These averages are significantly different (Student test at 1%). The moderately diverse diet contains almost the same food groups as the high food diversity plan. On the contrary, the diet "weakly diversified" does not include cereals, legumes, sugar, and fish. The overall average of 6 food

groups consumed by households of Songololo is higher than of Manica and Sofala, which had 4 food groups [4].

#### 3.5.2. Relations Between Food Diversity and Socio-economic Characteristics

Table 4 shows the relation that exists between food diversity of rural households and socio-economic characteristics.

**Table 4.** Relations between categories of food diversity and some socio-economic indicators (%) in relationship to the head of household.

Variables	Distribution of classes of Household Food Diversity Score (%) at Songololo			
	Low Food Diversity (1-5)	Average Food Diversity (6)	High Food Diversity (7-11)	
Household head gender	Men	20	22	59
	Women	34	27	39
Education	Illiterate	63	25	13
	Primary	38	26	55
	Secondary	19	24	57
	University	12	11	77
Main activity	Agriculture	30	28	43
	Other activities	24	30	49

This finding indicates that more the level of education of the household head is higher more the diet in the household is various. It was observed that households with high food diversity increased between 13% for the heads of illiterate households and 77% among household heads with a higher educational level. Several factors may be responsible for this disparity. It may be noted that households whose heads are illiterate are mostly run by women and almost live primarily with one income generating activity while households whose heads have higher education diversify a lot their sources of income and these households are headed by men. Low food diversity is strongly present in households headed by illiterate (63%) against only 12% for those headed by heads of households with a higher level of education. It was observed that 39% of households with high food diversity is conducted by women than these households led by men (59%). Finally, among the households living mainly from agriculture as generating source of income, 30% have low food diversity and 28% have an average food diversity, proportions slightly higher than those of households that practice other activities (24 and 27%). These last diversify their income generating activities and also practice

agriculture (99%) as a second source of income for their households. So, to feed properly the people, we need to recognize that food security is not only about increasing production but also improving household incomes and diets [23]. From the above, we see that the diet of households in Songololo is dominated by the consumption of cereals, roots, tubers, legumes and red palm oil. The general trend of this regime is the same in all the districts visited.

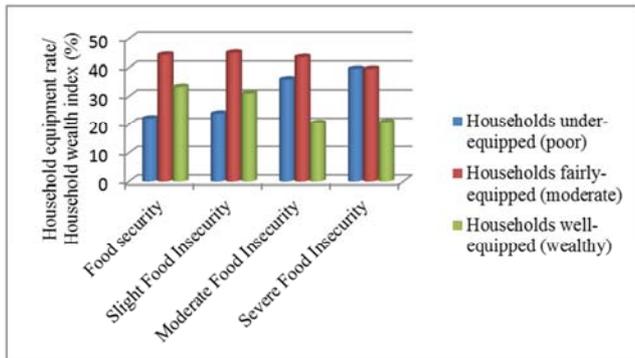
Furthermore, there is a combination of education and gender of the household head on the consumption of certain food groups: meat, sugar, milk and fish. Therefore, more the level of the household head is increasing more the consumption of these products is also increasing. In addition, households headed by men have a consumption rate of fish, meat, milk, sugar and fruits are slightly higher than those headed by women.

### 3.6. Food Insecurity Felt

#### 3.6.1. Level of Food Insecurity Felt by the Level of Household Equipment

More a household is well equipped (rich), the less it is affected by food insecurity. The figure below shows the

possible link between the level of food insecurity felt by rural households of Songololo and the level of possessions of material goods (figure 4).

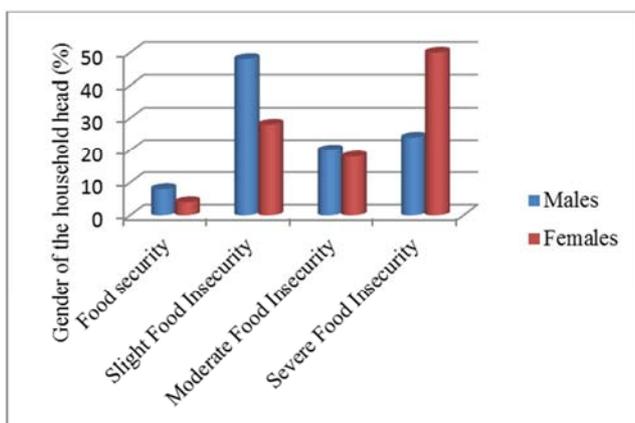


**Figure 4.** Level of food insecurity felt (%) compared to the level of household equipment.

With regard to figure 4 above, we see that the more households are equipped are the least affected by severe food insecurity or 20% against 40% of households under equipped and moderately equipped are affected by serious food insecurity. The moderate food insecurity affects 36% and 44% of under and moderately equipped households against nearly 20% of wealthy households. Furthermore, although the level of food security of the most equipped households (33%) is higher than in under equipped households (22%) but a contrast is observed at the level of moderately equipped households of which 44% amongst them have a food security, this value is higher than the one of well-equipped households (rich).

### 3.6.2. Experienced Food Insecurity Level (%) Compared to the Sex of the Household Head

The gender of the household head is a discriminating factor in living, including food security in rural areas. Figure 5 below shows the association that may exist between the level of food insecurity experienced by rural households of Songololo and gender of the household head.



**Figure 5.** The level of experienced food insecurity compared to the gender of the household head.

As shown in figure 5, severe food insecurity affects more

households headed by women (50%) than those headed by men (24%). Households headed by women are under-equipped and practice on average a reduced number of income generating activities (1.21) than those headed by men who exercised on average 1.55 of activity per household. As for slight food insecurity, it affects more households headed by men (48%) than those headed by women (28%). It is observed that the rate of moderate food insecurity is slightly higher among households (20%) headed by men than those headed by women (18%). This can be explained by the fact that households headed by men are more populous than those headed by women. [14] reported that the size of poor households is greater than that of the affluent and the number of their dependents is often higher. More households are headed by men; these households have on food security (8%) than those headed by women (4%), because the household male head varies their source of income and generally have a higher level of education compared women.

## 4. Conclusion

The aim of this work was to know the socio-demographic and economic profile of rural households in the territory of Songololo vulnerable to food insecurity. The field survey using a semi-structured questionnaire allowed us to characterize the different rural households according to their livelihoods, gender, education level and wealth of households. Three indicators for food security were used in this study: Scale of determining access the food insecurity experienced by households, food diversity score household calculated from the callback method of 24 hours and the food consumption score calculated from the return of 7 days. For practical, economic and time reasons, it would be desirable to use the FAO method based on the 24-hour recall, because it is easier to household members to remember the food consumed the day before during the last 7 days. Further studies are required in order to consider other aspects that were not addressed such as the amount of food, food consumed by women and children, the influence of the household head income on the safety and food diversity.

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