

Socio-economic Characteristics and Food Security in the Rural Area of the Northern of Côte d'Ivoire. Case of Three Villages: Napalakaha Nibolikaha and Tiagakaha

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Abstract The link between malnutrition and the framework of life has always been established in the literature. So, this present study was carried out in the interest of assisting a better orientation for nutritional's intervention strategies in the rural areas of Korhogo. It is part of project "Operational Strategy for improving the Productivity of Nutrient Crops for Vulnerable Rural Populations in Côte d'Ivoire". The cross-sectional survey, conducted from 11 to 30 June 2018, took place in three villages in the Korhogo region (northern of Côte d'Ivoire) to provide an overview of the socio-economic characteristics of rural communities. Technically, the sampling method was to survey all households in the study area. The results showed that 17.07 % of the interviewed families were single-parent families whose main activity was agriculture. On average, three people are housed in rooms and almost all households use drilling water for their domestic work. The food habits of these rural communities are 98.8 % access on the consumption of cereals (rice and maize). However, it should be noted that there was no latrine in these households, which has a negative impact on the hygienic conditions of the study area. It emerges from this study that the main evils that undermine the populations in this study are a long term lean season, which undermines the availability and accessibility of food. Thus, this study could be a guideline for a better orientation of policies and intervention strategies in the rural areas of Korhogo.

Keywords: socio-economic characteristics, food security, Korhogo region, rural population, Côte d'Ivoire

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1. Introduction

In the recent past, in many sub-Saharan African countries, agricultural growth has been mostly driven by more extensive use of land and reallocation of productive factors, not necessarily oriented to supplying local markets and reducing food insecurity. In rural areas of these countries, agricultural techniques are still rudimentary and do not ensure food and nutritional security. According to the FAO report in sub-Saharan Africa, there has been limited progress in reducing both undernourishment and child underweight [1]. This also suggests that all aspects of food security need to be tackled, including ensuring the

availability of, and access to, more and better quality food, enhanced hygiene conditions and access to clean water.

Defined as a medical condition resulting from the deficiency or excess of one or more essential nutrients [2], malnutrition kills more than 2.5 million children in the world each year [3].

In developing countries, it remains a major public health problem because of rudimentary food diets for infants and young children; which are negative effect on their nutritional status [4]. Indeed, according to WHO report [5], the most common forms of malnutrition are underweight, stunting, wasting and a low body mass index in relation for age. In addition, the prevalence of wasting and severe wasting was 52 and 17 million, respectively, among children under 5 years of age [6]. Thus, undernutrition

causes more than 3 million child deaths per year in poor countries [7].

In northern Côte d'Ivoire, nearly two-thirds of children aged 6 to 23 months suffer from global acute malnutrition, mainly due to lack of food diversification [8]. Thus, it is clear that despite the nutritional policy of governments, malnutrition rates are still unsatisfactory in Africa, especially in the most vulnerable areas [9]. It is therefore necessary for a more effective action to consider the problem of malnutrition globally in order to identify all its contours. Indeed, the relationship between malnutrition and the direct environment is well established in the literature. The difference in health infrastructure, the irregularity of food availability, parental education and that of the mother are determining factors in the child's health, especially when economic conditions are difficult [10].

This study is part of the project "Operational strategy for improving the productivity of nutrient crops for vulnerable rural populations in Côte d'Ivoire". This work is intended to serve as an advocacy for improving the living conditions of the rural populations of Korhogo; based his research on three villages. Specifically, it consisted in identifying data on the living conditions of populations, including socio-economic characteristics, dietary habits, food availability and accessibility.

2. Materials and Methods

2.1. Study Area and Population

The study was conducted from June 11 to 30, 2018 in Korhogo region of the northern of Côte d'Ivoire, specifically in the rural areas of Tiangakaha, Napalakaha

and Nibolikaha. These villages are respectively in the sub-prefecture of Napié and Koumborodougou (Figure 1).

Ecologically, Korhogo region is semi-arid, with fresh and dry winds from december to march, characterized by two great seasons [11]: a long dry season (November - May) and a large rainy season (June - October). The average annual rainfall is between 1100 and 1230 mm, with an average annual temperature of 26.7°C [12]. The vegetation is a grassy, tree savanna characterized by scattered trees and shrubs with a cover density of 25 to 35 % [13].

2.2. Sampling

Due to the lack of useful data to determine the sample size in these communities, our sampling method consisted of the census of all households. In practice, all households in these villages with a major representative at the time of the study were involved in the survey.

There were not concerned by this study:

- absent households;
- households without adult representatives.

Thus, the survey covered 85 households (20 Napalakaha, 39 Nibolikaha, and 26 Tiangakaha).

2.3. Choice of villages

The villages were selected from the database of the Helen Keller International (HKI) Korhogo section. The selection criteria used are:

- The agreement of the village chief to carry out this study;
- The organization of the inhabitants in associative groups;
- The ease of access.

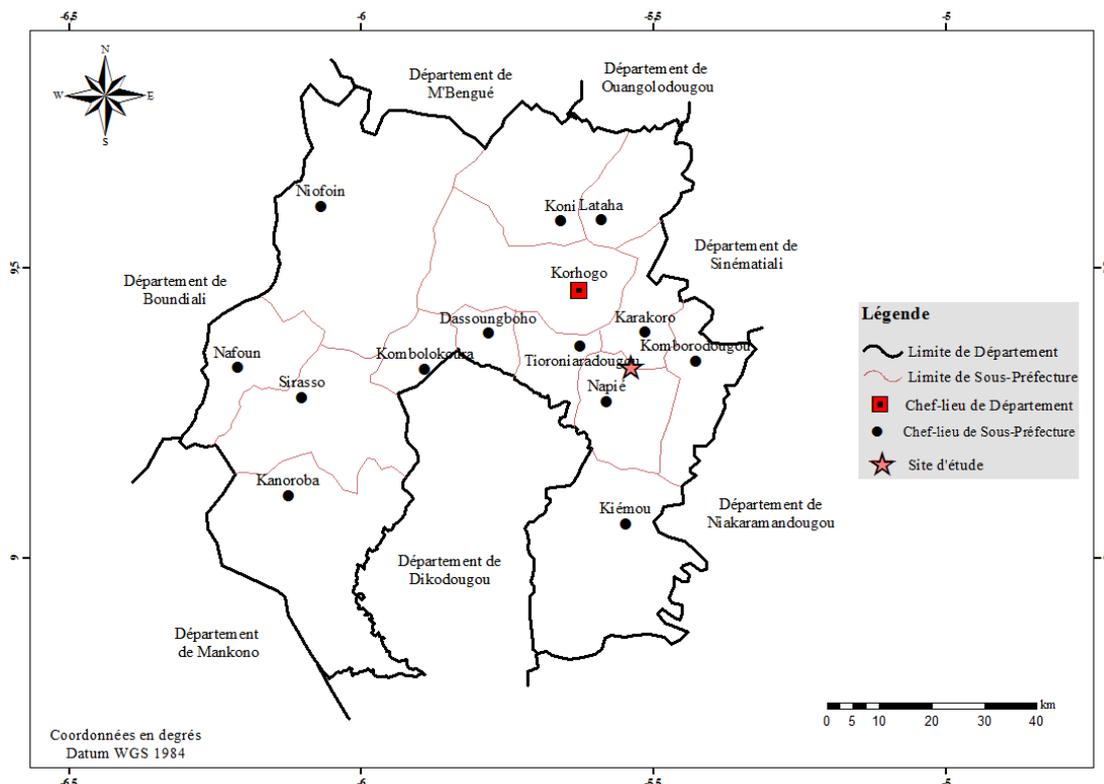


Figure 1. Map of Korhogo region showing the localities where the study was conducted

2.4. Mode of Data Collection

Data collection was done according to Arnaud's modified method in 2004 [14]. Informations were collected from the respondent using a semi-direct questionnaire. The study was conducted in each village by three trained teams, assisted by a locally recruited translator. A general field supervisor ensured the reliability of the data. It should be noted that the information was collected from the head of the household (more than half). However, when this is not available, the information on the survey form is obtained from an adult who is able to provide the household information. This is usually the spouse or a child.

2.5. Data Processing

After the information was analyzed, an input mask was developed using the Census and Survey Processing System (CSPRO) version 7.0 software, which was used to enter the questionnaire. Then, the data was verified before the production of tables by the SPSS software version 21. The various tables produced were exported to the spreadsheet MS Excel for formatting.

3. Results

3.1. Socio-economic Characteristics

The data on the characteristics of households showed

that 17.07% of the families found in these localities were of single-parent type with farming as the main activity at 95.76% (Table 1). There were between 2 and 4 peoples (with mean 3) in the household of the studied localities (Figure 2).

The majority of income came from field activities 95% at least except in Tiagakaha where it was 92% of farm income (Table 2).

The majority of inhabitants (98.73%) of these villages used borehole water for their domestic works with a small proportion of the inhabitants (1.27%) of Tiagakaha who had running water (Table 3). Otherwise, an average of 3 peoples were housed per room (Figure 2) in these households, and 87.1% of cases did not have latrines for their toilet needs (Table 4).

3.2. Food Consumption

The results showing the food consumption of village populations are presented in the form of tables or figures. Indeed, Figure 3 shows that the populations had consumed 98.8% of cereals including rice and corn. However, some foods were highly consumed: leaves (67.1%), fish (78.8%), meat (77.6%), beans (76.8%) and sweet potatoes (54.1%). During the lean season, the villagers consumed only food habits were reduced by the consumption of corn, rice, beans (Table 5) in the form of *kabato* (78.9%) (a local paste of corn meal) diluted in water, dried rice crust (5.3%), porridge (5.3%) etc. (Figure 4).

Table 1. Percentage distribution of households by family type

Family type	Napalakaha	Nibolikaha	Tiangakaha	All localities
Parental (%)	76	87.2	80.58	81.26
Mono-parental (%)	19	12.8	19.42	17.07
Other (%)	5	0	0	1.67
Total (%)	100	100	100	100

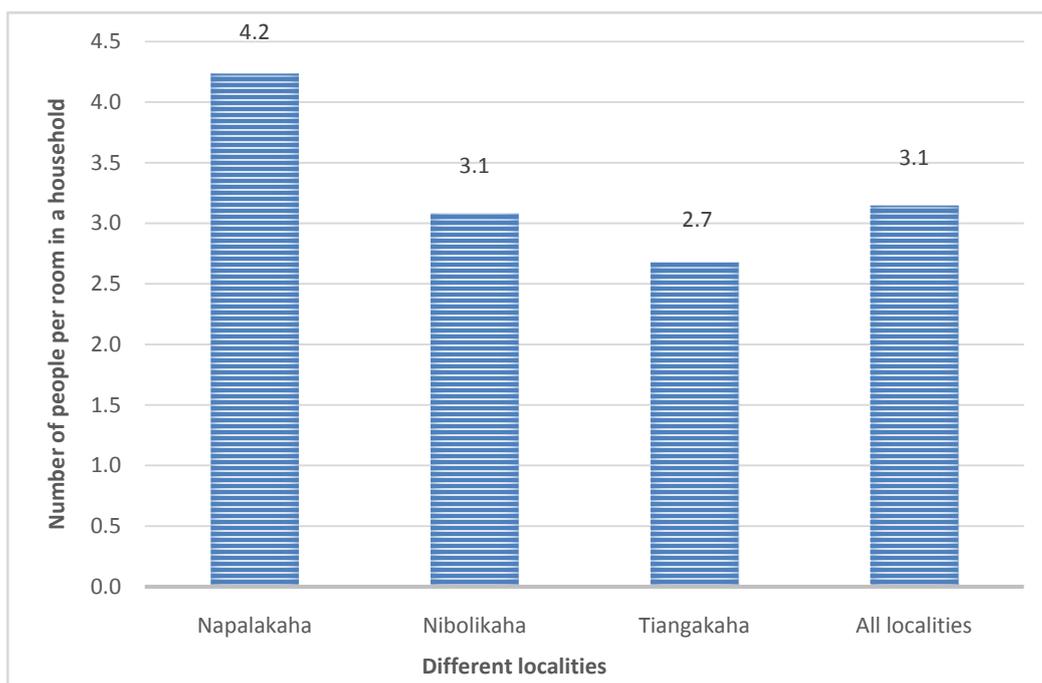


Figure 2. Average number of people living per room in a household

Table 2. Percentage distribution of households by source of income

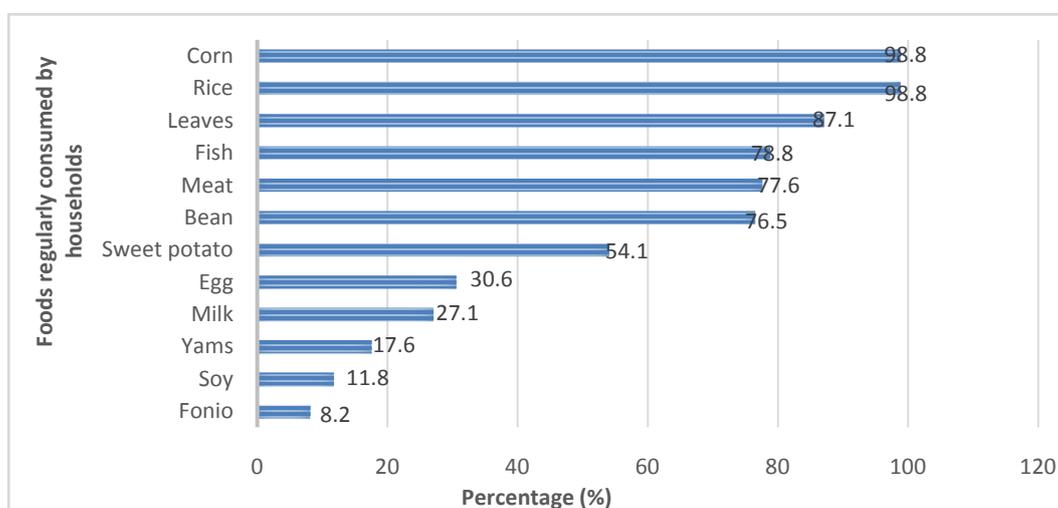
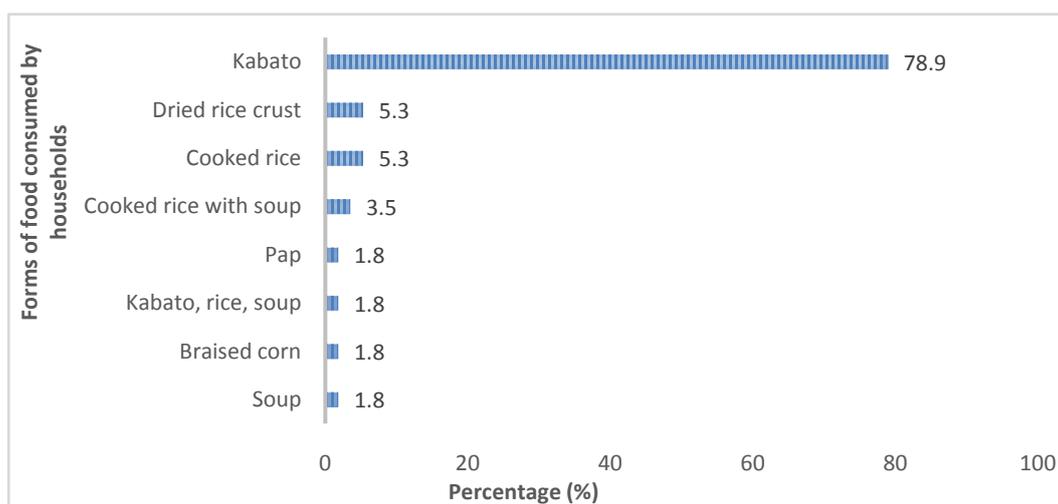
Source of income	Napalakaha	Nibolikaha	Tiangakaha	All localities
Farm income (%)	95.0	100	92.3	95.76
Other source of income (%)	2.0	0	8.70	4.24

Table 3. Percentage Distribution of households by water source

Source of water supply (%)	Napalakaha	Nibolikaha	Tiangakaha	All localities
Water neck	0	0	3.8	1.27
Drilling water	100	100	96.2	98.73
Well Water	0	0	0	0
River Water	0	0	0	0

Table 4. Distribution of households by latrine possession

Latrine in the households	Napalakaha	Nibolikaha	Tiangakaha	All households
Yes (%)	15.0	10.3	15.4	13.57
No (%)	85.0	89.7	84.6	86.43
Total	100	100	100	100

**Figure 3. Foods regularly consumed by households in the study area****Figure 4. Form of food consumed during the lean season****Table 5. Foods regularly consumed during the lean season**

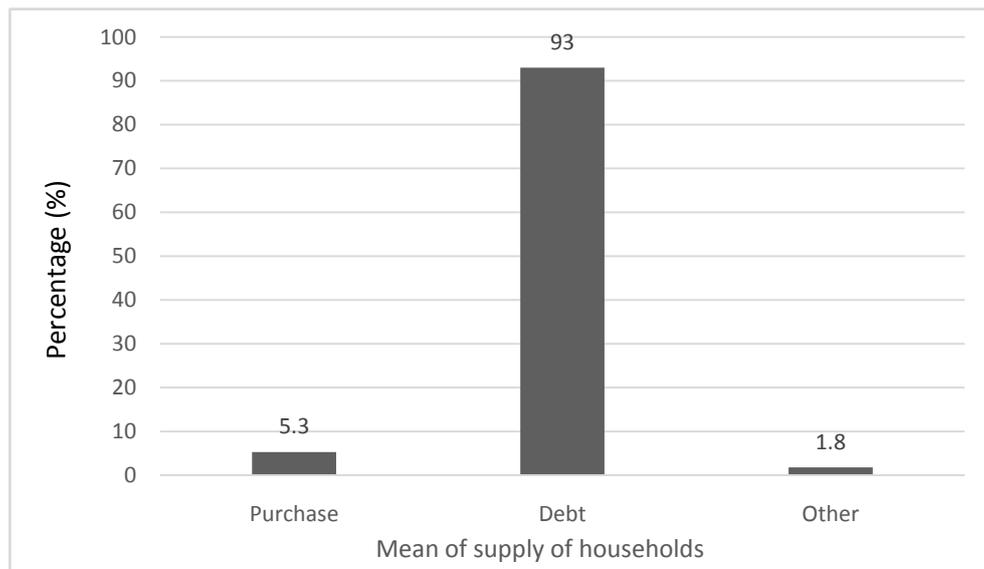
Foods	Values (%)
Bean	1.8
Corn	80.7
Corn, rice	3.5
Rice	14.0
Total	100.0

Table 6. Frequency of annual food availability in target villages

Food availability	Napalakaha	Nibolikaha	Tiangakaha	All the localities
yes (%)	35	5.1	73.1	37.73
No (%)	65	95	27	62.27
Total (%)	100	100	100	100

Table 7. Lean season in target villages

Lean season	Napalakaha	Nibolikaha	Tiangakaha	All the localities
August	38.5	97.3	0	45.26
July	61.5	2.7	85.7	49.97
March	0	0	14,3	4.77
Total	100	100	100	100

**Figure 5. Mean of supply of households during lean season**

3.3. Annual Food Availability

The annual food situations of all studied households were presented in the Table 6. In fact, nearly 62.27% of households did not have food throughout the year with a high proportion (95%) in the village of Nibolikaha (Table 6). This effect was aggravated during the drought period from March to July for the locality of Tiangakaha and from July to August for those of Nibolikaha and Napalakaha (Table 7). Thus, during this period; 93% of heads of households in these localities went into debt to supply households (Figure 5).

4. Discussion

The results of this study make it's possible to highlight the socio-economic characteristics and the food conditions of the three localities studied. It showed that 81, 26 % of the families encountered in these localities were of parental type whose main activity is agriculture. These results are in line with the data of Sylla et al [15] which clearly stated that agriculture is the main activity of rural households. That could be at the root of the difficulty of access to food during the year.

Indeed, according to the report on the analysis of the nutritional situation of Côte d'Ivoire; rural households whose main source of income is agriculture are the poorest [16]. This poverty would result in a continuous

decline in purchasing power significantly influencing household access to food. This fact was observed in the study area with 93 % of heads of households taking on debt to supply households. In addition to this situation, data analysis revealed that 62.27 % of the surveyed households do not have food throughout the year. This could be justified by a long lean period from March to August per year. According to Gbetoenonmon, fluctuating food prices during this period would increase the risk of severe malnutrition for the most vulnerable families [17].

This period corresponds to the time interval between the food stock and the beginning of the new harvest; was extended in regions with very high climatic variability such as that of Korhogo. We are then witnessing a decline or even the non-existence of food stocks and food availability. That is why the Food Agricultural organization recommended improving productivity of agricultural resources through sustainable intensification to increase food availability, food security and nutrition [1].

In addition, the food habits of the majority of populations on the consumption of cereals (rice and corn) at 98, 8 % were affected during periods of lack. Indeed, during this period; more than half of the households (78, 9 %) consumed corn in the form of *kabato* diluted in water. The *kabato* was a local food based on corn meal. This food habit could degrade the nutritional status of the population and therefore increase their vulnerability and food insecurity.

In addition, almost all the inhabitants of these villages use drilling water for their domestic work. However, an

average of three people was housed per room in these households, which in 86, 43% of cases do not have latrines for their needs. This was a hygiene problem faced by village populations.

5. Conclusion

It should be noted that the main evils that undermine the populations in this study are a long term lean season, which undermines the availability and accessibility of food. This situation is aggravated by the low income of heads of households reducing households to rudimentary food habits especially during the lean season. So, the relationship between malnutrition and the environment is unequivocal, the following recommendations are made to assisting a better orientation of policies and intervention strategies in the rural areas of Korhogo:

- Strengthen the financial capacities of households by diversifying income sources;
- Increase agricultural production by improving soil fertility and crop maintenance systems;
- Strengthen the nutritional knowledge of mothers or caregivers of children through nutrition education and cooking practices based on local foods;
- Strengthen the promotion of hygiene in households.

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Conflict of Interest

The authors declare that there is no conflict of interest.

References

[1] FAO, IFAD and WFP, The State of Food Insecurity in the World 2015. Meeting the 2015 international hunger targets: taking stock of uneven progress. Rome, FAO, 2015.

- [2] Abidine, A. A., Evaluation du statut nutritionnel des enfants de 6 à 59 mois des communes de Bamba et de Temera, Cercle de Bourem, Région de GAO, Thèse, Université de Bamako, Mali, 110 p, 2009.
- [3] UNICEF Burundi, analyse de la malnutrition des enfants au Burundi, Rapport, 112 p, 2013.
- [4] Elena, T.B., Predictors for the prevalence of under-nutrition, wasting and stunting of 3 to 12 years school aged children in the Asella Luther Child Development Project Oromiyaa, Ethiopia, *Journal Nutrition Human Health*, 2(2).1-10p.2018
- [5] World Health Statistics 2016: Monitoring health for the Sustainable Development Goals.
- [6] Jalali, A.K., Motlagh, A.D., Abdollahi, Z., Movahedi, A., Minaie, M., Abbasi, B., A Report of Health Related Anthropometric Indices in 2-5 Years Old Children of Golestan Province of Iran in 2015, *Clinical Nutrition Research*, 8(2).119-128p. 2019.
- [7] Gelli, A., Aberman, N.L., Margolies, A., Santacroce, M., Baulch, B., Chirwa, E., Lean-Season Food Transfers Affect Children's Diets and Household Food Security: Evidence from a Quasi-Experiment in Malawi, *The Journal of Nutrition*, 1(5). 1-10p. 2017.
- [8] Sangaré, A., Koffi, E., Akamou, F., et Fall, C. A., Etat des ressources phytogénétiques pour l'alimentation et l'agriculture: Second rapport national, Rapport, 65 p, 2009. <http://www.fao.org/tempref/AG/agp/countryreports/CotedIvoireFinalReport.pdf>.
- [9] Kaboré, N., Optimisation de la production de biscuits à base de patate douce à chair orange, Mémoire, Université polytechnique de Bobo-Dioulasso, Burkina Faso, 76 p, 2012.
- [10] Pooja, G., Shveta, L., Shivam, D., Abhishek, S., Malnutrition and Childhood Illness among 1–5-year-old Children in an Urban Slum in Faridabad: A Cross-Sectional Study, *Journal of Epidemiology and Global Health*, 9(1).19-22. p.2019.
- [11] Beaudou, A. G., et Sayol, R., Etude pédologique de la région de Boundiali - Korhogo (Côte d'Ivoire). Cartographie et typologie sommaire des sols. Feuille Boundiali, Feuille Korhogo. Notice explicative n° 84, ORSTOM, Paris, 48 p, 1980.
- [12] Adja, M., Etude de l'état hydrique saisonnier du bassin versant de la Bagoé dans un contexte de variabilité climatique. Départements de Boundiali et Tengréla (milieux soudano-sahéliens au nord-ouest de la Côte d'Ivoire). Thèse unique, Université de Cocody, Abidjan, Côte d'Ivoire, 170p, 2009.
- [13] OCDE, L'économie locale de Korhogo et de sa zone d'influence : rapport de synthèse, Paris, 7 p, 1999.
- [14] Arnaud, S., Etat nutritionnel et qualité de l'alimentation des enfants de moins de 2 ans dans le village de dame (côte d'ivoire), Mémoire, Université de Montpellier II Académie de Montpellier, France, 96 p, 2004, http://www.museum.agropolis.fr/pages/savoirs/agroalim_ci/Arnau_d_DESS_2004.pdf.
- [15] Sylla M., Affeli W. Côte d'Ivoire – Evaluation de la sécurité alimentaire à l'Ouest et au Nord, Rapport, 26 p. 2012.
- [16] Conseil National pour la Nutrition (CNN), Analyse de la situation nutritionnelle en côte d'ivoire, rapport, 78 p, 2015. http://www.nutrition.gouv.ci/fichier/doc/Analyse_situationnelle_15_08_16.pdf.
- [17] Gbetoenonmon, A., les crises alimentaires en Afrique de l'ouest une conséquence des politiques économiques, *le bulletin de Cotonou*, 1, 13 p, 2012. <https://library.fes.de/pdf-files/bueros/benin/09312-20120925.pdf>.

