Full length Research paper

Qualitative assessment of Food insecurity of Agricultural households in Madagascar

Dr. Zafitody C[1*], Pr Sylvain R[2]and Pr Romaine R[2]

[*1]Lecturer, University of Toamasina, Higher Regional Institute of Technology of the East Coast.
[2]Full Professors, University of Antananarivo, Higher School of Agronomic Sciences,

Madagascar is highly exposed to major climatic risks, which is why this research focuses on the qualitative assessment of the level of food insecurity of agricultural households in rural Madagascar. The goal of food crop agriculture is self-sufficiency. All the conditions for production are met. Rice is the principal food of the population, given that every farmer grows rice. Rice cultivation even becomes a custom because a growing season without rice is a blank year. However, it is rare that a farmer can cover his need for rice with his own production. Food insecurity remains permanent, about 95.5% of the cases, and its manifestation varies from one household to another. The objective of this study is to propose a tool to qualitatively assess food insecurity in rural areas in the Atsinanana Region. The results have led to a tool called the food insecurity scale that classifies the level of food insecurity of producers. With this scale, the following food insecurity level ranking was obtained: 69% severe, 23% moderate and 8% acceptable. The methodological principle chosen was, in addition to the literature review, a survey toward 150 people and a total of 6 focus groups in the locality of the producers. The particular interest of this work is the fact that such a tool would allow managers to better understand the realities before elaborating a development project.

Key words: food security, household, food insecurity, food availability, food accessibility

INTRODUCTION

Madagascar's agricultural productivity depends on farming practices, climatic hazards and the volatility of market prices for certain cash crops. But all these aspects are exposed to major climatic risks, which is why Madagascar remains a poor country.

The Atsinanana Region, in the middle of the country's east coast, is the most affected due to its geographical location.

In this Region, 85.2% of the population lives in rural zone (Atsinanana Region, 2005; WDI, 2009).

Agriculture is of the food and family types with the objective of food self-sufficiency.

It would have formed the source of food and constituted the first source of income because all the conditions for agricultural production are met (Ramanoelina P.A.R. at al., 2010; Oumar D. 2006).

Certainly, rice is the principal food of the population. Therefore, every farmer still grows rice. Rice cultivation even becomes a custom in the area because a planting season without rice cultivation is a blank year.

However, it is rare that a farmer can cover his rice needs from his own production.

Food insecurity remains permanent, about 95.5% of the cases (Zafitody C., 2012).

It should be said that, food security consists of ensuring that everyone has physical and economic access to the food they need at all times (FAO, 1983).

So, how then can the farmers resist chronic food insecurity? The objective of this study is to propose a tool to qualitatively assess rural food insecurity in the Atsinanana Region.

The hypothesis put forward is that there are different levels of food insecurity among producers.

A tool to classify the level of food insecurity of farm households is expected from this research.

A survey toward 150 people followed by a total of 6 focus groups in the producer's locality was undertaken after a literature review.

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*Corresponding Author's Email:cozafitody@yahoo.fr

MATERIALS AND METHODS

Study area

The study took place in the Atsinanana Region of Madagascar in 2018. Geographically, it is located between 20° 27' 48.6066" and 17° 32' 7.2666" South latitude and between 47° 38' 45.2112" and 49° 34' 14.2638" East longitude. Its linear interface measures approximately 285 km with an average width of 75 km over an area of 22,382 km². It is composed of 7 Districts (Marolambo, Mahanoro, Antanambao Manampontsy, Vatomandry, Brickaville, Toamasina I and Toamasina II) and 84 Communes. The Region presents a diversity of productions characterized by crops that includes cereal (maize and rice), rental and industrial crops (sugar cane, coffee, cloves and little vanilla), tubers (cassava, sweet potato), vegetables, and fruits (liches, pineapple and banana) (Atsinanana Region, 2005).

Questionnaire and Interview Guide

Two tools, a questionnaire and an interview guide, were developed to collect the necessary information. These focus mainly on the household food situation, socio-economic characteristics and the population's lifestyle.

Sampling

Six rural villages, one per district, were randomly selected as research sites. One focus group per site was formed, for a total of 6 focus groups. Each focus group was composed of the 25 heads of households whose main activity was agriculture. An individual interview was then undertaken with these 150 heads of household.

Information collection: focus group and survey

During a research project in 2018, there were favorable circumstances to use the Participatory Rural Appraisal and brainstorming during the focus group to obtain the information expected in the interview guide and to fill in the gaps left by the interviews (Gueye et al., 1991; Khon Kean University, 1987). The questions asked during the interviews were of the closed and semi-open type. This strategy was accepted because it falls between formal research, which is expensive and slow, and informal research, which is too short to give reliable results (Groupe URD, 2002).

Triangulation

All these qualitative methods helped to understand the farmers' ideas about their way of life and more specifically about the standard of living of rural people. During the last days in the villages, after the field data collection, restitutions were organized with the interviewed people and the local populations to present the preliminary results of the work and to cross-check all the information.

Development of the food insecurity level scale

The epistemological work on the design of a model was indispensable as it allows the literature review and the points surveyed to be taken into consideration. This phase was divided into three phases.

Listing of variables

In this first phase, each focus group was asked to list the properties of food security in daily life. The properties listed should allow the qualification of the level of food insecurity of the zone. The goal of this approach is to obtain the properties, which become variable and relevant according to the perception of the population.

Sorting of selection criteria

During the second phase, the properties listed were sorted by the same people. The sorting was done in order of importance by vote of the participants after a long discussion among them. As a result, each group established the selection criteria for each variable. Another participatory method used was the preference matrix (Cunningham, 2001). It should be noted that the first two phases were carried out in a single brainstorming session of the same group.

Restitution

The third phase, restitution, took place a few weeks after the first two. During this phase, each group finalized the ranking of the variables that the participants judged useful and necessary. The objective was to assess the variables after weighting so as to rank them in order of importance according to participants' perceptions by district.
Finally, based on the results of the restitution, the survey was conducted to find justifications for the participants' perceptions using references frequently used and/or recognized in the current context.

RESULTS

Scale of level of insecurity

Variables of the insecurity level scale

Four variables were selected. They are the quantity of consumed rice, the daily consumption of rice, the consumed food, and the hunger gap. The synthesis of the restitution's results shows that the variable quantity of rice consumed is the most weighted (48%), for the 6

focus groups. Next come the nature of the food consumed (19%), the frequency of daily rice consumption (18%), and the hunger gap (15%). Participants in the six districts had the same point of views.

Characteristics of the variables

According to the literature review and the opinions of the population, the 4 variables are characterized as follows: (i) the quantity of rice consumed per person per year, (ii) the number of times the household eats rice during the day, (iii) the nature of the food consumed, and (iv) the average length of the hunger gap. Details are given in Table 1 below.

Table 1 : Food insecurity variables

Dimension of food security	Selected variables	Code	Scoring 1 to 3
Availability	Quantity of rice consumed	QC	1 if 00 kg ≤ QC < 48 kg 2 if 48 kg ≤ QC < 97 kg 3 if 97 kg ≤ QC ≤ 145 kg[1]
Accessibility	Daily consumption of rice	DCNP/ DCHP[2]	1 if DCNP< 3 times and DCHP < 3 times 2 if DCNP = 3 times and DCHP < 3 times 3 if DCNP = 3 times and DCHP = 3 times
Use	Food consumed	FC	1 if Unusual food products 2 if Usual food products 3 if Rice
Stability	Hunger-gap Period	HP	1 if 8 < HP ≤ 12 months 2 if 4 < HP ≤ 8 months 3 if 1 ≤ HP ≤ 4 months

<u>**Source:**</u> Author

So, this Table 1 sets out the characteristics of the variables following a particular survey of reference values, frequently used and/or recognized, on which the research was carried out.

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[1] 145kg: Average quantity of rice consumed per capita per year; reference to Atsinanana
[2] DCNP/ DCHP :Daily consumption of rice*:* **Normal period / Hunger-gap Period**

Presentation of the food insecurity levels scale

From Table 1 above, at the end of its 4th column, the scale of levels of food insecurity can be constructed.

Simply add up the totals of scores obtained per household interviewed. Then, the scale consists of the 3 levels, Severe, Moderate and Acceptable, as shown in Figure 1 below.

Rice: 3 times a day at 145 kg/capita/year	**Acceptable** 8 < SO* ≤ 12	< 4 months of hunger-gap
Rice: twice a day with 97 kg/capita/year	**Moderate** 6 < SO* ≤ 8	4 - 8 months hunger-gap with usual food products
Rice: 1 time per day with 48 kg/capita/year	**Severe** 0 < SO* ≤ 6	+ 8 months hunger-gap with unusual food products

Figure 1: Scale of levels of food insecurity
Source: Author
(*): Scores Obtained

According to this scheme, based on the scores obtained (SO), a household is at the Acceptable level of food insecurity if SO∈] 8; 12], Moderate if SO∈] 6; 8] and Severe if SO∈ [0; 6].

Assessing the level of food insecurity

Using the food insecurity scale, the summary of the results of the level of food insecurity is as follows: 69% severe, 23% moderate and 8% acceptable. The details are shown in Table 2 below.

Table 1: Level of Food Insecurity (FI) in %

Districts	Level of FI Severe	Moderate	Acceptable	Total
Marolambo	71	21	8	**100**
Mahanoro	70	22	8	**100**
Antanambao Manampontsy	70	23	7	**100**
Vatomandry	68	23	9	**100**
Brickaville	68	25	7	**100**
Toamasina II	67	24	9	**100**
Average	**69**	**23**	**8**	**100**

Source: Author

This table shows that, the situation over all the districts is similar in terms of the food security. In general, the major part of people, 69%, are at the severe level. The 23% are at the moderate level and only 8% are at the acceptable level, i.e., family members eat well all year round.

DISCUSSIONS

Scale variables

The 4 variables selected match to the 4 main dimensions

of food security. Hence, the quantity of consumed rice matches to availability. Daily rice consumption is linked to accessibility. The food consumed is corresponding to the use and the hunger gap sounds with stability (FAO, 2006).

Quantity of rice consumed

It is the permanent availability of the sufficient quantity of rice consumed, i.e. 145kg per person per year. In this study, it is corresponding to the dimension of food availability. This refers to the sufficient quantity and appropriate quality, which is supplied by national production or imports, including food aid (FAO, 2006).

Daily rice consumption

It is the permanent access to food resources. It is the daily consumption of rice or other suitable food at a frequency of 3 times a day. This is the accessibility dimension. It refers to the access of all people to adequate resources (rights) to acquire appropriate and nutritious food. Rights are defined as the set of goods to which a person is expected to have access because of the legal, political, economic and social context of the community in which he or she lives (FAO, 2006).

Food consumed

It is the possibility to use food products appropriate to the customs and habits of the place ones is living. Usually, the principle food is rice, but it can be replaced by common food products. This is the use dimension. It is about how the body optimizes the different nutrients in foods. Good care and feeding practices, food preparation, dietary diversity, and food distribution within the household result in adequate energy and nutrient intake (FAO, 2006).

Hunger-gap Periods

It is the ability to live with the non-interruption of adequate food all year round, that is, zero hunger-gap. This is the stability dimension. To achieve food security, a population, a household or an individual must have permanent access to adequate food. This access to food must not be threatened by the emergence of sudden shocks or cyclical events. The concept of stability can therefore refer to both the availability and access aspects of food security (FAO, 2006).

As a result, Figure 2 below is a simplified way of illustrating the relationships between the approaches.
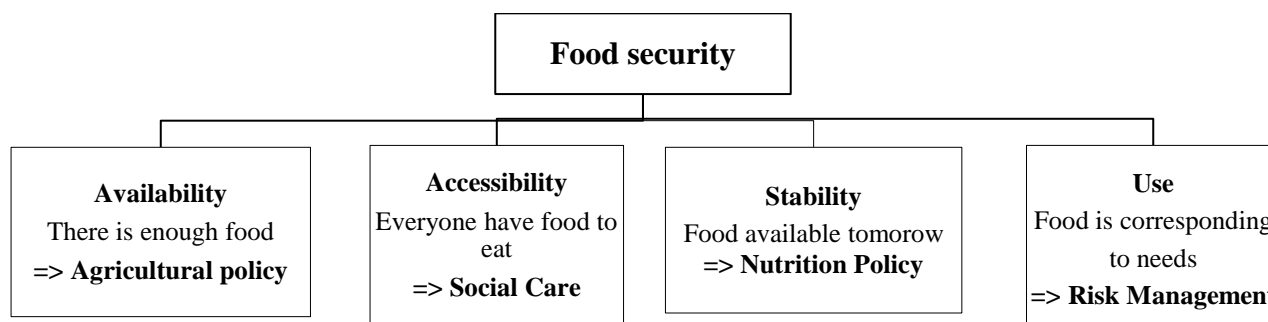

Figure 2 : Dimensions of food security
Source: Author, 2020

It uses the internationally agreed conceptual framework, which bases food security on four dimensions (availability, accessibility, use, stability).
Social care policies for food security are mainly related to the dimension of access to food, while agricultural policies are more concerned with food availability.

Classification of the level of food insecurity

There is an analogy between the present classification and the one set out in the FAO's report in 2019 entitled "The State of Food Security and Nutrition in the World: Safeguarding Against Economic Slowdowns and Down turns". This report distinguishes between two levels:
- Severe food insecurity, which refers to the concept of hunger, affecting more than 700 million people, or 9.2% of the world's population, and
- Moderate food insecurity, defined as people with out access to safe and nutritious food, affecting 1.3 billion people, or 17.2% of the population (FAO, IFAD, UNICEF, WFP and WHO, 2019).

Here, according to the survey and analysis, with the scale, the results 'summary of the food insecurity level ranking is as follows: 69% severe, 23% moderate and 8% acceptable. These ratios tend to be similar for the producer in each district (Zafitody, 2012).

Severe level

It concerns the most precarious household, which suffers from a chronic hunger gap (more than 8 months), where unusual food products become an alternative. Its family members eat rice less than 3 times a day, all year round, with a consumption of less than 48 kg per person per year. The major part of the population of the Atsinanana Region, 69% of the cases, is in this classification of severe food insecurity.

Moderate level

Poor Households, average level, which bears an annual hunger gap (4 to 8 months) during which usual food products are provided, on the one hand, and members eat rice less than 3 times a day on the other hand. Rice consumption is between 48 to 97 kg per person per year. 23% of the population is in this moderate level of food insecurity.

Acceptable level

Households, perceived comfortable, which do not experiment hunger gap period. Members eat rice well 3 times a day with a consumption of 145 kg per person per year. Only 8% of the population is in this acceptable level of food insecurity.

CONCLUSION

The objective of the study is to propose a tool to qualitatively assess the food insecurity of producers in the Atsinanana Region. The resulting scale of the level of food insecurity reflects the reality of the current living conditions of the region's population. With the scale, the results' synthesis on the ranking of food insecurity level is as follows: 69% severe, 23% moderate and 8% acceptable. The 4 variables selected correspond to the 4 main dimensions of food security defined by the FAO. They are: the quantity of consumed rice (availability), daily rice consumption (accessibility), food consumed (use) and the hunger gap (stability). In general, producers in all districts show almost identical situation in terms of the level of food insecurity. It would then become possible to classify households using the scale and correctly identify household food situations.

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