THE SOUTHEAST ALLOCHTHONOUS GROUP AND GINGER CULTIVATION: FALAISE-EST BETSIMISARAKA. DISTRICT OF BRICKAVILLE, ATSINANANA REGION (MADAGASCAR)

TELY Abel[1], RAMANANARIVO Sylvain[1,2], RAKOTOARIVELO Marie Laure Ajorque[1,3], RAZAFIARIAJONA Jules[1], RANAIVOARISOA Holy Farahanta[1], RAMANANARIVO Romaine[1,2]

1. *Ecole Doctorale Gestion des Ressources Naturelles et Développement (ED-GRND), Equipe d'Accueil Agro Management de Développement Durable et Territoire (AM2DT), Université d'Antananarivo, Madagascar*
2. *Ecole Supérieure de Management et d'Informatique Appliquée, Antananarivo, Madagascar*
3. *Centre d'Information et de Documentation Scientifique et Technique (CIDST)*

SUMMARY

In Madagascar, as in all African countries, climate change is leading to migration, particularly to rural areas. The high-altitude area of Brickaville in the Atsinanana Region is marked by a strong migration of people from south-east Madagascar. A multi-faceted relationship is forged between this social group and its environment in the production of ginger (sakarivo). Although the ginger-growing area, located in a border zone between the Region of Alaotra-Mangoro (18°56'58.1" S and 48°13'48.3" E) and the Region of Atsinanana (18°8'57.1" S and 49°24'8.4" E), would normally have been an area of inter-ethnic confrontation linked to land, a certain loosening of local land tenure rights on the part of the natives has been observed. At the same time, the ginger-free zone of Brickaville, at low altitude, is characterized by land saturation, and therefore by a scarcity of land for new arrivals. These contradictory realities lead us to formulate the following problem: "How can we present the cultivation of ginger as the only central factor sufficient to attract these migrants from the South-East to settle in the high-altitude areas of Brickaville or on the Betsimisaraka East Cliff? The aim is to define the complexity of the migratory system of the population coming from the South-East. The systemic approach and the commodity chain approach have enabled us to see the choices of crops and the anchoring of ginger. These choices are related to the order of importance of the speculations. The reasons for the territorialization of ginger cultivation in this specific area are linked to the land capacity and the essartage system, which enables these migrants to adopt the appropriate land appropriation system for this cash crop. These elements are the central factors determining this situation, which explains why ginger cultivation is one of the migratory strategies.

Keywords : *Ginger, essartage, Brickaville, Sud-Est, rural migration, migration strategy*

Author contact: abeltely@yahoo.fr ; 032 40 274 40 / 034 53 448 51

INTRODUCTION

Migration is a deliberate strategic choice (Barbieri and Confalonieri, 2011b) and/or strategic investment (Lapage et al, 2007). Sometimes it is a response to persistent climate change when coping strategies reach their limits (IMF, 2017). In other words, it is "a strategy mounted to reduce damage, to take advantage of and/or reduce the adverse consequences of climate variability" (Ambroise et al., 2009). It is a strategy of empowerment, or more precisely, a strategy of adaptation to climate risks (IOM, 1992; Kaezing, 2015; McLeman and Smit, 2006). As a result, rural-rural migration must be directed towards areas where a vital strategy can be developed. Families or communities that remain in the area of departure often work with networks linked to the host area to make migration possible (Geddes, 2012).

Ginger cultivation is territorialized in the communes of Andekaleka, Lohariandava and Ranomafana (Antongombato) (18°49'0" S and 49°4'0" E). We can speak of a ginger territory because the place is "constructed" (Pecqueur, 2009), "appropriated" (Tchekemien, 2008) by these southeastern migrants and has spatial boundaries (Georges and Verger, 2006). The place is constructed because it is a creation of society, but it is delimited by human action (Darly, 2009). Appropriation is the transformation of a space by a group in order to secure production and satisfy vital needs (Lefebvre, 1974).

A territory implies the recognition of limits and is associated with the recognition of borders (Tchekemien, op. cit.). A multi-faceted relationship is woven between the social group identified in Brickaville as the Sud-Est group (migrants from southeastern Madagascar) and its environment in the ginger production activity. Initially, these migrants came for a survival strategy, but over time they have become "migrant actors of change", key players in the development of the host area through ginger production (De Haas, 2010). Growing ginger is taboo, however, according to Betsimisaraka tradition, the ancestral soil cannot be dredged to plant ginger; such action is tantamount to an insult to the ancestors, the owners of the land and the genies of the soil. In fact, this reflects the limit of the right of use given to migrants. In addition, the ginger-growing area is located in a border zone separating the Alaotra-Mangoro Region (18°56'58.1" S and 48°13'48.3" E) and the Atsinanana Region (18°8'57.1" S and 49°24'8.4" E).

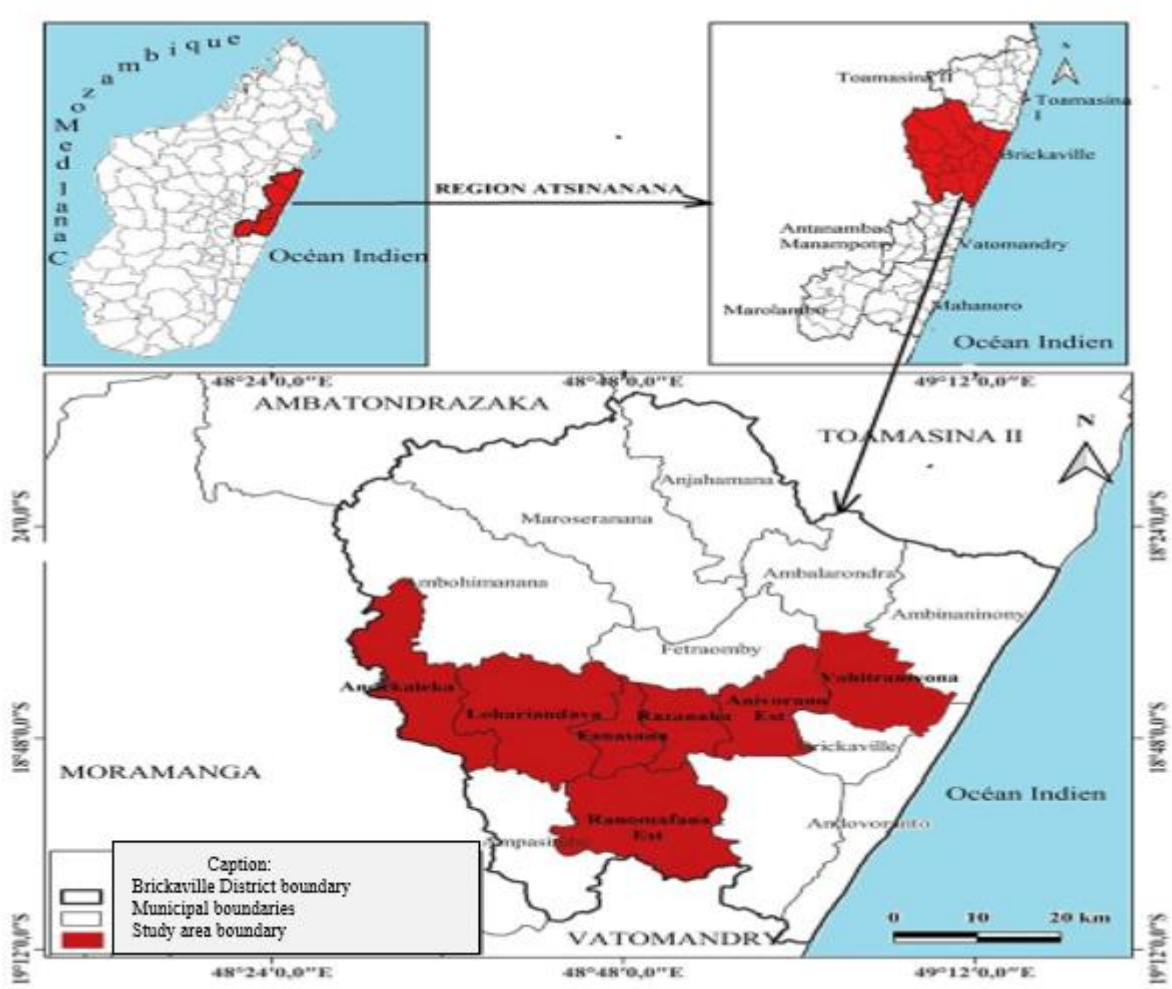
Although this kind of area would normally be a place for inter-ethnic confrontation over land, a certain loosening of local land laws on the part of the natives has been observed. At the same time, the ginger-free zone at the lower altitude of Brickaville is characterized by land saturation, and thus a scarcity of land for new arrivals. These contradictory realities lead us to formulate the following problematic: "How can ginger cultivation be presented as the only sufficient central factor that could attract these migrants from the South-East to settle in these high-altitude areas of Brickaville or on the East Betsimisaraka cliff? The overall aim of the study is to understand the factors influencing ginger production in their current production areas. The specific objectives seek to understand the factors determining the choice of speculation in the selected zones and to apprehend the factors of the anchoring of ginger in its current zone of predilection. Two research questions arise: Are land capacity and natural and forest resources the same for these migrants from the South-East to settle in this specific area, rather than migrating to all the communes in the Brickaville district? And what are the links between migration from the South-East and ginger cultivation and land resources?

1. MATERIALS AND METHODS

1.1. Study area

The Brickaville District is located in the Atsinanana Region (18°8'57.1" S and 49°24'8.4" E), 100 m south of Tamatave. It also lies at longitude 49°04' E and latitude 19°48' S (Map 1).

Surveys were carried out in Antongombato and Andekaleka during the exploratory phase to test and verify the sequence of questionnaires. This enabled the survey sheets to be revised. Particular attention was paid to Andekaleka, Lohariandava and the Fokontany of Antongombato (Ranomafana CR), where ginger production is at the forefront. The study area was then extended to Fanasana, Razanaka and Anivorano, where ginger cultivation has been neglected, and then to Vohitranivona, where the absence of this crop may be of interest to the issues addressed in this study.



Map 1: Location of the study area

With an area of 5,297km2, this district had around 27,865 inhabitants in 2018 (RGPH-3, 2020), representing 1.9% of the population of the Atsinanana Region. The study area is classified in the "East and shady cliff" zones, characterized by a hot, humid to perhumid climate, with a temperature of around 20°C, with rainfall not exceeding 1,600 mm, at an altitude between 300-800 m (ONE/SAGE, 2004).

This temperature of 20°C is favorable to ginger cultivation; ginger requires a tropical or subtropical climate where the temperature is high for at least part of the year, as well as plenty of sunshine and high annual rainfall in excess of 2 m (Maistre, 1964). This climate also favors fruit crops such as lychee, banana, lychee rambutant, pocanelle and pineapple, for which the country is famous. Sugar cane has also been developed thanks to the SIRAMA company, which has been operating here since 1930. Production is reported to be declining, if not fading, since 2000, when the company went into crisis (Vololomboahirana, 2011). This crisis triggered another recent wave of southeastern migration to the high-altitude area of Brickaville, mainly in Andekaleka, where the new migrants are engaged in ginger cultivation. In the livestock sector, cattle rearing is extensive; pig and poultry rearing is also family-based, with little care taken.

In the livestock sector, cattle rearing is extensive; pig and poultry rearing is also family-based, with little care taken.

1.2. Data collection and processing methods

Bibliographical research was used to analyze documents dealing with ginger and to understand the situation of the industry in general. Webography was used to enrich the data on marketing and the international position of this spice.

Participant observation was used. This involved seeing operations in action: (i) on the farm, to see how production units function; (ii) in the transport sector, to see how products are loaded, transported, stored in warehouses and sold on the market. This method enabled to identify the workings of the supply chain, from the agricultural fields through transport to the market. This participant observation was simultaneously followed by interviews with the players involved. Life stories were also collected to understand the family ties between collectors and producers, and the agrarian histories of the communes and villages visited.

It was essential to call on third parties proposed either by the mayors (security agents, commune staff), or by people known to the commune being surveyed. This action enabled us to meet the main informants, insofar as the villagers only proposed important producers from their village.

Table 1: Study population

Communes Rurales (CR)	Number of producers surveyed			Number of collectors surveyed		Number of resource people surveyed	TOTAL
	Survey methods			Survey methods		Methods	
	By card	Focus	Meeting	By card	Focus	Free interview	
CR RANOMAFANA							
CR ANDEKALEKA	28	7	39	3	0	3	
CR LOHARENDAVA	20	6	44	1	0	1	
CR FANASANA	0	10	0	0	3	1	
CR RAZANAKA	0	4	0	0	0	1	
CR ANIVORANO	6	0	0	2	0	1	
CR VOHITRANIVONA	0	5	0	0	0	1	
CR RANOMAFANA (Fkt Antongombato)	24	4	0	2	0	3	
DISTRICT BRICKAVILLE	0	0	0	0	0	2	
DISTRICT TOAMASINA	0	0	0	0	0	4	
Subtotal							
	86	36	83	8	3	15	231

Workforce							
%	37	16	36	3	1	6	100
TOTAL	231						

The 231 respondents were divided into: producers, 86 of whom were interviewed individually (37%), 36 in focus groups (16%) and 83 in meetings (36%); collectors, 8 individually (3%) and 3 in focus groups (1%); and resource persons, 15 in all (6%). The information collected was processed using Excel and SPSS statistical software.

1.3. Choice and order of importance of crops

To assess the choice and order of importance of crops, the following hypothesis was put forward " The disparity in the choice of crops in the three agro-socio-economic zones of the study area can be explained by the rationality of farmers in relation to the order of importance of products for them". This involves analyzing the spatial distribution of speculations, the order of usefulness of agricultural products and the perceived importance of crops.

- **The spatial distribution of crops** is based on the main agricultural productions in the study area. Crops were selected by means of agro-socio-economic zoning.
- **For the order of usefulness of agricultural products,** the aim is to analyze the connection between ginger and existing cropping systems. The approach used was the scorification method to see the production systems practiced and the order of importance of products in the agro-socio-economic zones of the study. In addition, the destination of the products was analyzed: self-subsistence products for food and cash products to improve income. In the case of income, it is then necessary to see how it is broken down, either into basic income or supplementary income. By basic income we mean income obtained from the sale of all production, while complementary income is income obtained from the sale of surplus produce. It therefore concerns the immediate usefulness of agricultural products for food and income security.
- **For the perception of the importance of crops,** the different crops are classified to see the perception of importance in the agro-socio-economic zones of the study by dividing them by dial: A positive perception Commune and District (+, +), B negative perception Commune and positive District (-, +), C positive perception Commune and negative District (+, -) and D negative perception Commune and District (-, -).
- **Historical analysis and territorial anchoring of ginger.** The historical and territorial analysis of ginger was based on the following hypothesis: "the weight of the agricultural history of each commune, as well as land access typologies, influence the territorial anchoring of ginger". Four steps were required: comparison of biological resources used, analysis of the geographical distribution of ginger production, mapping of ginger-growing areas, and analysis of land access.
- **Comparison of biological resources used.** The method used was participant observation and documentation. The aim was to determine whether the territorial anchorage of ginger in the high-altitude zone stems from the differentiation of biological resources used in each zone, as these elements may explain the prioritization of speculations in each zone.
- **Analysis of the geographical distribution of ginger production and mapping of ginger-growing areas**. The aim is to understand the weight of the agrarian history of each commune by means of a survey and documentation to discover former ginger-growing areas, and to discern the systems by which ginger cultivation has been abandoned.

- **Analysis of the typology of access to land:** This involves identifying access to land in relation to the areas where these migrants have settled, through observation, survey and documentation.

2. RESULTS

2.1. Ginger, a crop already territorialized in the Falaise-Est Betsimisaraka Region

2.1.1. Spatial distribution of crops

The study site is classified into three distinct agro-socio-economic zones (Table 2) :

- Zone 1, characterized solely by the strong presence of ginger cultivation (CR Andekaleka and CR Lohariandava)
- Zone 2, characterized by the presence of ginger cultivation and the introduction of new crops such as kola and ravintsara (Antongombato CR Ranomafana-Est);
- Zone 3, characterized by the absence/ disappearance of ginger cultivation, but marked by the strong emergence of turmeric cultivation, market gardening and the introduction of new crops such as kola and ravintsara (CR Anivorano/CR Razanaka/CR Fanasana/CRVohatranivona).

Table 2: Main agricultural products in the study area

Communes	Characteristics of the main speculations							
	Rice	Banana	Manioc and corn	Various fruits	Ginger	Curicuma	Market gardening	Kola and Ravintsara
CR Andekaleka	+	+	+	+	+			
CR Lohariandava	+	+	+	+	+			
CR Fanasana	+	+	+	+		+	+	+
CR Razanaka	+	+	+	+		+	+	+
CR Anivorano	+	+	+	+		+	+	+
CR Vohitranivona	+	+	+	+		+	+	+
CR Antongombato	+	+	+	+	+		+	+

2.1.2. Order of usefulness of agricultural products

The ratings received by the rice and banana crops, without minimizing those received by the ginger crop, are also important. Cash crops are generally intended for basic income, obtained by selling the entire production. Surplus self-subsistence products are also sold (Figure 1).

Ginger, bananas and rice are among the most important agricultural products in zone 1 (Commune rurale Andekaleka et Loriandava). As for Fokontany Antongombato (CR Ranofamana - East), cassava, maize, banana, kola as well as ravintsara are the most exploited. For zone 3, CR Fanasana, CR Razanaka, CR Anivorano-est and CR Vohitranivona, rice and bananas are the most developed (Figure 1).

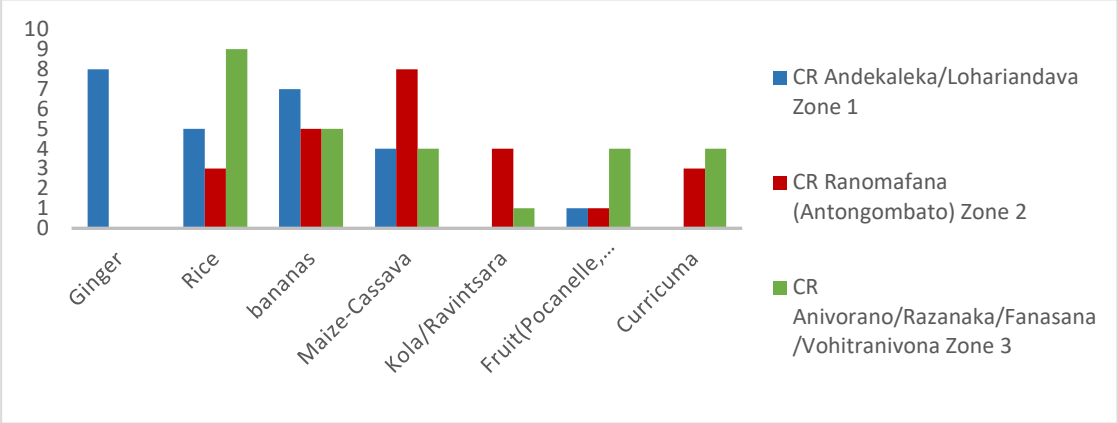


Figure 1: Order of usefulness and importance of products in agro-socio-economic zones

2.1.3. Perception of crop importance

The positioning of each type of crop across the study area and in relation to the Brickaville district as a whole confirms the importance of rice cultivation (R1, R2, R3), banana cultivation (B1, B2, B3), and ginger cultivation (G1), described in the previous table, which is found in quadrant B. The position of fruit (F3) and turmeric (C3) is in the middle of quadrants C and D, but they tend to be located in quadrant D. This shows that these two crops will be important in many communes in the years to come (Figure 2).

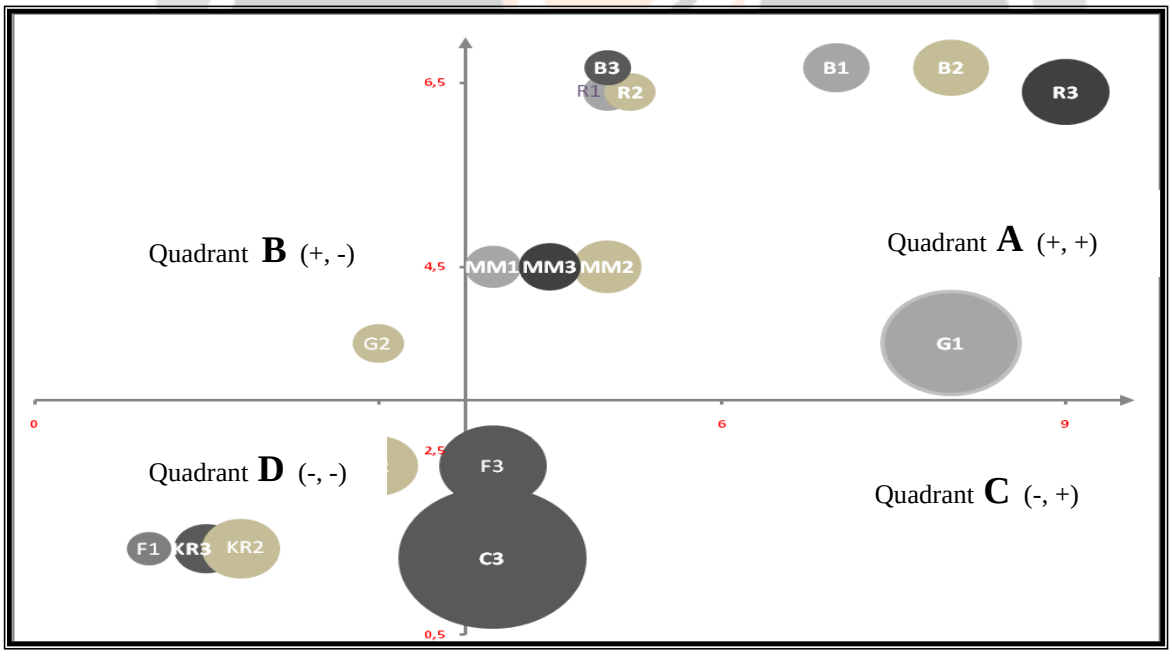


Figure 2 : Product classification and positioning

2.2. Link in agricultural history and access to land to ginger's territorial roots

2.2.1. Comparative analysis of biological resources used by each zone

The biological resources of the three zones are practically the same, and the few differences do not influence the choice or refusal to grow this spice, which does not require a specific soil (Table 3).

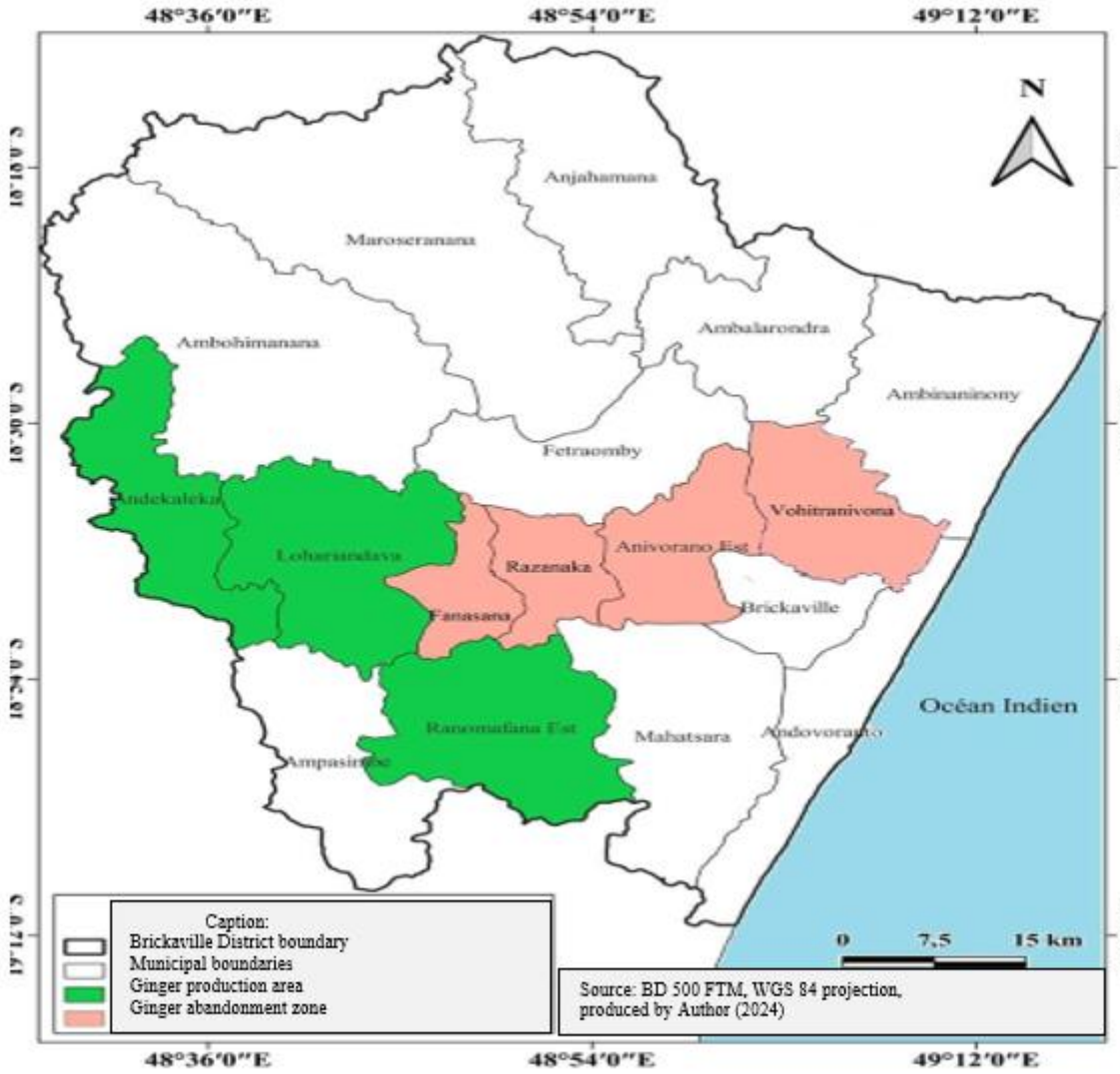
Table 3: Types of biological resources

		Resource type	Soil type
Zone 1	CR Andekaleka, CR Loharendava	Medium-altitude evergreen rainforests	They are composed of yellow/red ferralitic soils and volcanic rocks. Some differentiation can be found in Andekaleka, where the soils are characterized by little evolved and ranker soils.
Zone 2	CR Ranomafana (village Antongombato)	Savannahs and pseudo-savannahs with woody elements and some degraded evergreen rainforests	
Zone 3	CR Anivorano, CR Razanaka, CR Fanasana, CR Vohitranivona	Degraded low-altitude evergreen rainforests	

Source: PRD Atsinanana

2.2.2. Causes of the geographical distribution of ginger production

The historical trajectory of ginger cultivation along the TCE railroad axis confirms that it began in Anivorano in the late 1960s, before moving to higher altitude areas and settling in Andekaleka and Lohariandava in the 1970s. The village of Anivorano is accessible by rail, land and river, thanks to the main river in the Brickaville district, the Rianila, which flows through this crossroads village. As a result, the communes where ginger cultivation has now disappeared are Anivorano (first place of settlement), Razanaka and Fanasana (Map 2).



Map 2: Location of ginger cultivation areas

Nowadays, ginger is only grown in the two socio-agronomic zones of the study area, more specifically in three communes (Map 2). These three areas (CR Andekaleka, CR Lohariandava and Antogombato of CR Ranomafana) were therefore selected as the study area. The fall in demand from Antananarivo markets has driven down the price of this spice for producers. This in turn led to a fall in supply from producers. By the logic of the law of markets, the price rose once the product became scarce. However, such a price-stimulated recovery did not always increase production in areas that had abandoned ginger. At some point, these areas were reconverted, as the seed was unobtainable in these territories, while in other areas its price soared, and the product was thus neglected.

2.2.3. Land access typologies

The study area is characterized by two types of land tenure:

- **Land constraints in the area where ginger cultivation has been abandoned**: Lands are difficult to access, and is sometimes even locked up by local families, who are more numerous in a village. On the other hand, open-access forests are not very extensive, and traces of coffee concessions remain, while on the other, inherited rice fields are shared within the large family.
- **Access to land in the ginger-growing zone is more or less easy.** Migrants are obliged to settle in porous intermediate zones that are easier to access, such as Antongombato (in the RN2), Andekaleka (in the TCE) and Lohariandava (in the TCE). They can develop a farming strategy that easily enables them to appropriate land in order to implement a specific production system.

This system results in three types of fields (Table 4):

- Type I located next to the main village.
- Type II marked by access to loans or leases from secondary forests and long or short fallow land.
- Type III marked by new migrants where access is identical to type II. However, the type III field is more favorable to both new and local migrants, as this type provides a means of easily appropriating land. Foreigners first settle in this area, clearing the primary forests, reclaiming the long fallow land and cultivating ginger, then taking possession of the cleared land with the right of the first axe. Migrants then become landowners.

Table 4: Field typology and operation

CHARACTERISTICS	TYPE I	TYPE II	TYPE III
Distance from the main village	Located next to the main village	Located a little further from the main village	Located a little further from the main village
Existing speculations	Fields of perennial crops (coffee, cloves, fruit trees, bananas, etc.)	Long fallow or savoka fallow recovery fields	Forest-cleared fields
Field size	Small-scale	Quite large in size	Large size
Type of ginger field	Fields of ginger combined with other crops	Monoculture ginger fields under shrubs	Monoculture ginger fields
Age of field	Former cash crop concessions	Main field or old field	New fields
Type of habitat	No settlement (because it is located near the village where the main settlement is)	With individual housing (as it is located a little further from the main village)	With temporary housing

3. DISCUSSION

3.1. Understanding the choice and order of importance of crops

Rice is the dominant crop in the study area, with an estimated 160 working days per year (PCD Andekaleka) for lowland rice cultivation with two cropping seasons and rainfed rice cultivation in the mountains. Rice is the farmers' primary reason for living: if the family lives in a given village, it is to grow rice, which is the staple food and main source of income

Maize, which arrived in the country in the 18th century (Randriambola, 2005), is eaten green (cooked, grilled, in salads, soups, etc.), and is intended for self-consumption, accompanying rice in the rural communes of Ranomafana and Vohitranivona. Following the fiasco of the SIRAMA sugar company in 2000, farmers squatted on the company's sugarcane land to convert it to corn. The promotion of this product has been reinforced by the green revolution since 2008.

Cassava is Madagascar's second most important food crop after paddy (Ranaivomanana, 2007). In the study area, every rural household has at least one plot of manioc cultivated in its fields, but very few grow it for purely commercial reasons, as it is intended for self-consumption and as a substitute for rice, or even for animal feed.

Banana (B1, B2, B3) accompanies rice in the study area, as marketing is more or less organized both in the communes along the "TCE railway" (Andekaleka, Loharendava, Fanasana, Razanaka and Anivorano) and those along the RN2 (Ranomafana and Vohitranivona) (Figure 2). The agricultural history of the eastern region is still marked by coffee cultivation, so bananas are grown in these coffee fields (Blanc-Pamard, 1992). A cash crop favoured by colonization since 1895, particularly along the TCE line (Blanc-Pamard and Ruff, 1992), developed by UCOFRUMAD in 1961 and then by UCOFRUIT from 1967 onwards (Andriamparamanjaka, 2007), the banana sector occupies a prime position. The loss of international outlets for this product since the 1970s is due to the decline in product quality and non-competitive prices (Dewailly, 1970).

Fruit crops (F) (letchi, letchi rambutan, soursop, pocannelle, then banana) take on an important role in further east due to strong demand, especially from the capital and then from other urban centers such as Tamatave (Tely, 2011). Curricuma (Curcuma longa Linné), focused for years in Anivorano, then moved to other surrounding communes such as Razanaka, Fanasana and Vohitranivona, is an emerging product. Its progress, specifically in zone 3, is the result of interventions by public and private organizations.

Cultivation of Kola and Ravintsara (KR): Ravintsara is currently being planted, while Kola is beginning to bear fruit after a few years. Production contributes to producers' additional income.

Ginger (G) is becoming increasingly important as the altitude rises. The choice of this crop is reserved for those who don't have enough arable land, especially rice paddies. This is why in areas with a high concentration of migrants, such as the village of Antongombato (CR Ranomafana), Andekaleka and Lohariandava, this crop is grown by migrants (Table 2, Figure 1, Figure 2, Map 2).

3.2. Understanding the agrarian history and roots of ginger cultivation

Ginger, whose scientific name is Zingiber officinale Roscoe, and whose Malagasy sound is "sakamalaho, sakay tany and sakarivo", is the 5th most important spice (after peppers, capsicum, spice seeds, cinnamon and

blackcurrant) and has been around for 3,000 years (Randriamihajatinamanantsoa, 1995). Brought by immigrant farmers, it arrived around 1960 in the rural Commune of Beforona, then a new variety from Reunion Island was popularized from 1970 onwards by the agricultural services (Zafimahova, 2006). Its establishment in Madagascar is poorly known, but it has long been cultivated on the east coast for medicinal and self-consumption purposes.

The reasons for the neglect of ginger in these three communes (CR Anivorano, CR Razanaka, CR Fanasana) stem from a general drop in price during the 1980s. As a result, farmers lost interest in the crop. Domestic demand for the product began to pick up again around 1993, as a result of a reduction in supply and a widespread harvest. Those who randomly reserved the crop were victims of theft. Faced with this situation, growers adopted generalized harvesting as their only solution, and we witnessed a permanent shortage of seeds due to the sale of stocks.

The revival of the fruit sector in accessible areas due to the opening up of demand from the capital (Antananarivo), the actions of NGOs and then the public sector as well as the revival of turmeric cultivation in Anivorano, the decline of sugar cane cultivation since the closure of SIRAMA, which has given way to maize cultivation, have all contributed to the abandonment of ginger in these areas. Indeed, the monopoly of the Andekaleka and Lohariandava collectors on rail transport networks supports this abandonment; collectors who are not in their group will not have a groupage share in Madarail's weekly loading. In addition, the development of other, more or less perennial, commercialized agricultural activities as a source of income in these areas where ginger cultivation has been abandoned has contributed to the total abandonment of ginger cultivation in favor of other crops that are easier to grow, such as turmeric.

3.3. Understanding the use of land appropriation systems through essartage

These migrants from the South-East like to settle in areas where access to land is easier, and adopt the right-of-first-axe system. In fact, they favor two agricultural activities, tavy to grow rainfed rice and ginger for income. They are also in the habit of rotating rainfed rice and ginger. In order to occupy the land acquired by this right of the axe for longer, after rice, they have sought by all means to grow ginger to appropriate the land already occupied a second time and in a different way, hence the resumption of ginger cultivation in currently producing areas such as Andekaleka, Lohariandava and Antongombato.

Grubbing is an easy way to appropriate fertile land and plots, with a minimum of work and lower labor costs. It should be noted that this same system is used in other places, such as in the south-western region of Madagascar, where "the population, whether immigrant or local, turns to the forest for its agricultural activities, as forest land offers better yields, with little effort and less expense, and yet production is good compared with cultivation" (Mara-Tsirahonanarivo, 2013).

The main ginger fields are located far from the village: 3.3 km in Andekaleka, 2.5 km in Lohariandava and 1.7 km in Antongombato :

- The tendency in the railroad zone is to keep as far away as possible to protect the crops from theft;
- for the RN2, it is to get as close as possible to the village, taking into account that they live in an accessible area, and therefore at the mercy of thieves.

CONCLUSION

The overall aim of the study was to examine the factors influencing ginger production in its current territory, corresponding to the area of high migration of people from the South-East. The high-altitude ginger-producing areas of Brickaville and the East Betsimisaraka cliff are characterized on the one hand by abundant natural and forest

resources to which local families have free access, and on the other by other non-producing areas where land management is more or less strict. The results obtained thus confirmed the first hypothesis: the disparity in the choice of crops in the three agro-socio-economic zones studied can be explained by the rationality of the farmers in relation to the order of importance of the products in their homes.

The central factors that attracted these southeastern migrants were the land capacity of these settlement areas and the possibility of adopting the specific system of land appropriation linked to ginger cultivation. This is an agrarian system based on essartage, enabling access to fertile land with a minimum of work and at a lower cost, because even family labor can carry out all the work stages, starting with clearing, burning, weeding and planting. With this system, a professional migrant ginger planter can have three types of fields at his disposal, and he can then lend or rent two of these to newcomers from the south-east like himself. This situation systematically encourages the promotion of ginger farming in these producing areas, and irreversibly provokes this other rural migration mechanism. Ginger cultivation is therefore a migration strategy. These results confirm the second hypothesis: the territorial anchoring of ginger is influenced by the weight of the agricultural history of each commune, by the typologies of access to land and not by the types of biological resources used.

The results obtained raise a number of questions: What are the circumstances or factors that might prompt these migrants to return home to their areas of origin?

BIBLIOGRAPHIE

Ambroise K, Daze A, Ehrhat C. (2009). *Analyse de la vulnérabilité et de la capacité d'adaptation au changement* climatique. CARE, 52 p.

Andriamparamanjaka. (2007). *Diagnostic et stratégie de développement rural dans la région Antsiranana : cas de la Commune rurale de Brickaville.* Mémoire de Maîtrise ès-sciences économiques, Département économie, Faculté de Sciences économiques et de Gestion, Université de Toamasina, 134 p.

Barbieri et Confalonieri. (2011b). Climate change, migration and health : exploring potential scenarios of population vulnerability in Brazil. In E. Piguet, A. Pécoud et P. de Guchteneire (Eds), Migration and Climate Change, 20p

Blanc-Pamard et Rakoto-Ramiarantsoa. (2000). *Le terroir et son double. Tsarahonenana 1966-1992, Madagascar, Paris, IRD Éditions, 254 p.*

Blanc-Pamard et Ruff. (1992). *La transition caféière côte-Est de Madagascar, Collection « Documents Systèmes Agraires* » N° 16, France, 248 p.

Dabat. (2008). *L'histoire inachevée de la régulation du marché du riz à Madagascar.* Économie rurale, 303-304-305

Darly. (2009). *Faire coexister ville et agriculture au sein es territoires périurbains. Antagonismes localisés et dynamiques régionales de la conflictualité. Analyse du cas de la région de l'Ile de France, . Thèse de Doctorat en Géographie,.* Ecoles des Hautes Etudes en Sciences Sociales, France, 480 p.

De Haas. (2010). (2010). « Migration and development: A theoretical perspective », International Migration Review, 44(1), pp 227-264.

Dewailly. (1970). "*La culture de banane d'exportation à Madagascar"*. dans Madagascar Revue de Géographie n°16, 1970, Université de Madagascar, pp 7-43.

FMI. (2017). "Les effets des chocs meteorologiques sur lactivitee economique : quelles strategies pour les pays à faible revenu?". dans International Monetary Fund. Research Dept. Octobre 2017. p. 292.

Geddes. (2012). "Migration, Environmental Change? and the "Challenges of Governance", Environnement and Planning C: Politics and Space, 30 (6), pp. 951-967.

Georges et Verger. (2006). *Dictionnaire de la géographie. Ed. Presses Universitaires de France, Coll.Quadrige Dicos Poche, 2ème édition (1970), 457 p.*

IOM. (1992). "Migration and the Environment" dans Geneva : IOM and Refugee Policy Group. p. 441.

Kaezing. (2015). *Migrations et changements climatiques : étude de cas dans les Andes boliviennes.* Thèse de Doctorat en Géographie, Université Neuchâtel, 253p.

Kistler. (2003). *De l'importance de la communication dans le monde rural à Madagascar. Le cas de la Falaise-Est, Center for Development and Environment(CDE), Projet BEMA et Bureau d'Etudes DERAD, Antananarivo, 182 p.*

Lapage L.P, Fluet M. J., Rochette A. (2007). *Vulnérabilité des populations et adaptation aux variabilités climatiques au Sahel : acteurs, institutions et dynamiques locales. Rapport des contributions canadiennes au projet ACDI-CILSS : appui aux capacités d'adaptation aux changements climatiques.* Montréal, Canada. 273p.

Lefebvre. (1974). "La Production de l'espace". *Paris, Revue L'Homme et la Société numero 31-32, pp 15-32,* pp 15-32.

Lefebvre. (2017). *Theorie des systemes complexes appliquees à la modelisation, 252 p.*

Maistre. (1964). *Les plantes à épices, Tome I, Paris, Edition Maisonneuve et Larose, 290 p.*

Mara-Tsirahonanarivo. (2013). Relation entre les mouvements migratoires et la dégradation forestière à Madagascar : cas de la Commune Rurale de Beahitse, Région Atsimo Andrefana, Mémoire de fin d'études pour l'obtention du Diplôme d'Études Approfondies, 80 p.

McLeman, R., Smit, B. (2006). Migration as an Adaptation to Climate Change. ... Change 76, 31–53 (2006). https://doi.org/10.1007/s10584-005-9000-7.

Mundler P. (1999). « Agriculture et mobilité sociale. Ces agriculteurs venus d'ailleurs » In Économie rurale. N°253. Emploi agricole, emploi rural. Continuités, ruptures, innovations. pp. 21-27.

ONE/SAGE. (2004). *Analyse diagnostic du littoral Est* (Soanierana-Ivongo, Brickaville), ARSIE (Association du Réseau des Systèmes d'Information Environnementale), Antananarivo. 160 p.

PDC Andekaleka. (2009). *Plan Communal de Développement Andekaleka, Février 2009. 156 p.*

Pecqueur. (2009). *De l'exténuation à la sublimation : la notion de territoire est-elle encore utile ? Géographie, économie, Société 11 (1), 55-62.*

Ranaivomanana. (2007). *Réforme de la politique agricole : évolution et perspectives ; mémoire de fin d'études en vue d'obtention du diplôme de maîtrise ès-sciences économiques (option développement), Université d'Antananarivo.* 79 p

Randriambola Rindraniaina Hanitra. (2005). *Projet de culture et de commercialisation de maïs dans la région de Vakinankaratra,* Mémoire de fin d'études pourl'obtention de Maîtrise, Faculté de Droit, d'Economie, de Gestion et de Sociologie, Université d'Antananarivo, 119 p

Randrianarison Tiana Heriniaina. (2011). *Migrations internes : cas des tireurs de pousse-pousse dans la ville d'Antsirabe, mémoire de Maîtrise,.* Faculté de Droit, d'Economie, de Gestion et de Sociologie. Département Sociologie, Université d'Antananarivo. 163 p

Tchekemien. (2008). *L'impact d'une politique publique agricole européenne sur les acteurs et les territoires ruraux français, Etude de l'application du programme français de développement rural dans six territoires ruraux,* Thèse de Doctorat en Géographie, 559 p

Tely. (2011). *Diagnostic stratégique de la culture de gingembre dans le district de Brickaville Région Antsiranana, Mémoire de DEA, Département Agro-Management, ESSA, Université dAntananarivo, 165p.*

Vololomboahirana. (2011). *Canne à sucre : Pôle de développement de la Commune rurale de Brickaville, Mémoire de Maitrise es-Sciences Economiques, Département économie, Faculté de Sciences économiques et de Gestion, Université de Toamasina.* 134 p

Zafimahova. (2006). Contribution à la valorisation du gingembre de Beforona : cas du Séchage. Mémoire de fin d'études, ESSA, Département Industries Agricoles et Alimentaires, Université d'Antananarivo, 111 p