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COMMERCIAL FOOD CROP MARKETING CHAINS AND TOWN FOOD SUPPLY IN EAST AFRICAN MOUNTAIN REGIONS

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There is increasing pressure on mountain ecosystems as they provide a variety of resources. The increase in population as well as rapid urban growth and rising urban-rural movements bring new urban-rural dynamics and modes of integration of mountain regions. Mountains can be seen as “open” in exchange systems including at multi geographical scales. Since the collapse of traditional cash crops, mainly coffee, mountain agriculture has shifted to other profitable products. This shift has been in response to the increasing food demand from urban areas, at the local, national and even international levels. Vegetables, for example, have become both a food and cash crop. Mount Elgon and Mount Rungwe (this latter is included in the Uporoto Mountains²) are respectively located in Eastern Uganda and in south-west of Tanzania. Their ecosystems supply large quantities and quality foodstuffs for the rural inhabitants of the highlands as well as the numerous lowland urban areas which can be far off. We will use the mountains under study as a starting point to understand agricultural marketing chains and how they constitute production basins in between the countryside and towns through a dialectic process (Vaudois, 2000)³. This contribution deals with the interactions between production areas and the urban market. How do mountains contribute to the food supply of nearby and distant towns? What are the modalities of exchanges within mountain areas and distant urban markets? The central hypothesis assumes that in an imperfect market environment, agricultural chains contribute to an imperfect integration of mountain actors and mountains to the national territory. An imperfect market is a material and an immaterial device through which the flows of non-standardised goods and information are fragmented. In addition, the many stages in the market chains restrict producers’ access to the market. An imperfect market is a defective market i.e. it is characterised by many failures and obstacles such as lack of credit and information asymmetries; distortion of competition and inertia of production factors (Lipchitz A., 2008) as well as lack of effective transport infrastructure. This study focuses on bananas (plantain) and round potatoes⁴ which are the main commercial food crops. They are highly visible in the landscape and in market places. The geographical approach adopted in this contribution is partly based on agricultural marketing approaches, i.e. emphasis is given to the different stages along the chains. However the focus will not be on the economic analysis rather the objective of this paper is to show some geographical interactions induced by agricultural flows, at the mountain level. The first part concerns the productive dimension of

¹This contribution is inspired by Racaud S., Cazenave-Piarrot A., Bruneau J.C. (2010) “Vegetable marketing chains and town food supply from East African mountains”. Paper presented at the “*Global Change and the World’s Mountains*”, Conference, Perth, Scotland, UK, 26-30 September 2010.

² The expression « Uporoto Mountains » refers to the geomorphological whole, « Uporoto Highlands » refers to higher altitude zones and Mount Rungwe is the name of the dormant volcano (2960 m).

³ Vaudois Jean (2000) « Les dynamiques spatiales des productions légumières : l’évolution récente des bassins endiviers du Nord Picardie ». In *Revue Méditerranée : Dynamiques spatiales des cultures spécialisées*, tome 95 n°3-4, pp 65-74.

⁴ Round potatoes are locally called Irish potatoes, it refers to *Solanum tuberosum*.

the chains, the second section looks at the commercial exchange places and their accessibility, and the last point covers the actors and the price fixations of the food crops.

1 DYNAMICS OF FOOD CROP PRODUCTION IN TWO DYNAMIC MOUNTAINS

1.1 The environmental context

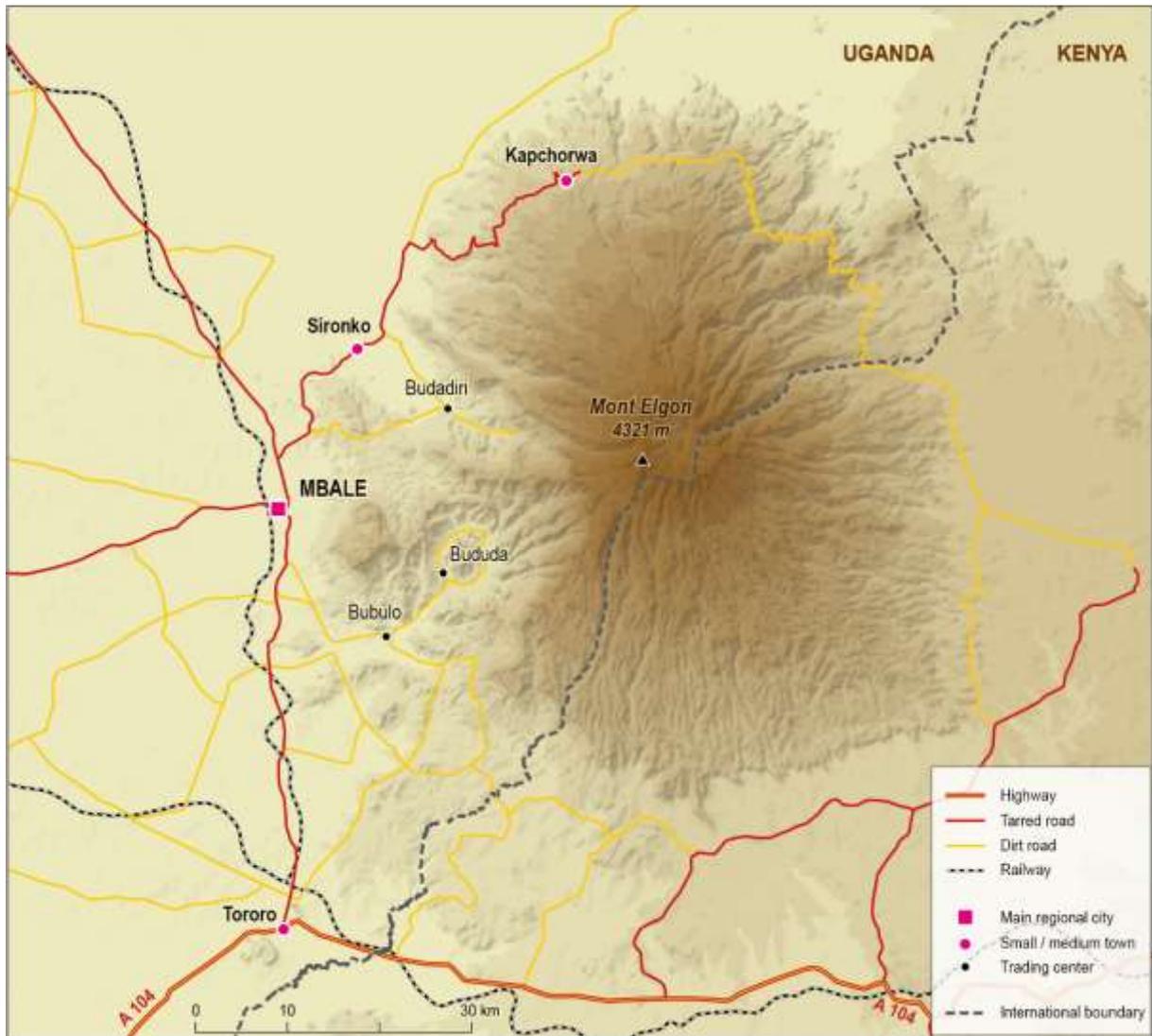
Uporoto Mountains are located in Tanzania, at the junction of the Eastern and Western rifts; a complex geomorphological whole which combines the rift system and volcanism. Mount Rungwe is a stratovolcano in this system, and rises to 2960 m above sea level. Mount Elgon is also a stratovolcano located in Uganda, west of the eastern rift valley. The mountain's highest point is named "Wagagai" and rises up to 4321 m above sea level. These two mountainous regions are peripheral to their national territories. Mbeya Region is bordered in the south-east by Malawi and in the south-west by Zambia whereas Mount Elgon is crossed by the borderline between Uganda and Kenya. Mbale and Mbeya towns act as outlets for local agricultural products and as go-between with more or less distant markets. Mbale town is 230 km from Kampala and is located 50 km north to the corridor Nairobi - Kampala. The railway crosses Mbale and links this latter with the lowlands. The location of Mbeya city is strategic with regard to the sub-region. The city is about 850 km from Dar es Salaam. Mbeya is a busy commercial centre linked to Dar es Salaam and to southern African countries by both the Tanzania-Zambia highway and the Tanzania-Zambia railway. Being a border city, the position of Mbeya makes it special as it constitutes a "business gateway to the neighbouring land-locked countries of Zambia, Malawi, Zimbabwe, as well as the south-eastern part of the Democratic Republic of Congo" (Foecken and al., 2004: 34). Besides fulfilling commercial functions, Mbale and Mbeya towns are administrative headquarters. Mbale is the capital of Mbale district and Mbeya city is the headquarter of Mbeya region.

Mount Elgon and of Mount Rungwe are dormant volcanoes, their ecosystems present some similarities: they offer favourable conditions for agriculture. The soils are mainly fertile volcanic ash soils (andosols). Rainfall is higher in Mount Rungwe than in Mount Elgon. From Mbale (1150 m) to the upper part of the cropland areas, rainfall ranges from 1000 to 1800 mm/year. Rainfall is very high in Mount Rungwe located 50 km north-west of Lake Nyasa due to orographic precipitations. From Mbeya (1700 m) to the top of the crop belt, the rainfall ranges from 1000 to 2600 mm/year. In the research area, the foodstuffs under study are mainly situated at altitudes between 1300 m and 2300 m above sea level. The natural conditions of temperate climates, the considerable rainfall and the rich soils give the two sites structural advantages to mountainous environments for agricultural production.

Fig. 1. Mbeya and Uporoto Mountains



Fig. 2. Mbale and Mount Elgon (J Buosi, 2015)



In addition to natural conditions, human factors also explain the valorisation of mountains. The two sites are old densely populated areas. In Mount Elgon, the Bagisu settled since the sixteenth century on the southern and the western slopes of the mount, while the Sebei colonised the northern part. In Uporoto highlands and in Mount Rungwe, the two main tribes are the Nyakyusa and the Safwa. The Nyakyusa came from the shore of Lake Nyasa and the south-western ridge of Uporoto Mountains. They have progressed towards the Mount Rungwe and nowadays they represent 95% of the population of Rungwe district. The Safwa took refuge in the Uporoto to protect themselves from the raids of the Wasangu in the middle of the nineteenth century. The Safwa are the original inhabitants of Mbeya town, but nowadays the Nyakyusa are more in the city. The table below presents some indications about the population in the two mountains.

Table 1. Population Features on Mount Elgon and Uporoto Mountains

MBALE (2002) ⁵					
Districts population		Area (Sq.kms.)	Headquarters' population		District Pop. annual growth rate, 1991-2002
Mbale	718240	2466	Mbale	71130	3,1
Kapchorwa	190391	1738	Kapchorwa	8747	4,2
Sironko	283092	1090	Sironko	11193	2,5
TOTAL	1191723	5294	TOTAL	91070	
MBEYA (2002) ⁶					
Districts population		Area (Sq.kms.)	Headquarters		District Pop. annual growth rate, 1988-2002
Mbeya Urban	266422	214	Mbeya town	266422	4,1
Mbeya Rural	254069	2432	Mbalizi ⁷	29768	2,8
Rungwe	306380	2211	Tukuyu	15941	0,9
TOTAL	826871	4857	TOTAL	312131	

The two research areas are highly populated. The total population of Mount Elgon is higher than that of Mbeya area but the population of the major town of Mbeya is three times more than that of the major town in Mount Elgon. This is mainly due to the weight of Mbeya city which is almost four times more inhabited than Mbale. The urban centres in Uporoto area are much bigger than those in Mount Elgon. There is an imbalance between the two sites, and also inside the two sites where the regional urban centre strongly dominates the secondary centres. The population annual growth rates are important and uneven among the two areas. The two capitals are absorbing more and more inhabitants and rural populations still rapidly increase although rural areas are saturated. Despite their population's increase, Elgon witnesses emigration, the district's migratory balances are negative⁸, and the population is sustained by high natural growth. In Mbeya, population rise is sustained by a relatively high natural growth and by the attractiveness of urban areas for which one third of development depends on immigration (Muzzini, Lindeboom, 2008).

Population densities are very high, especially on the slopes of Mt Elgon. According to the national census, average density is 533 inh/km² in Mbale district (including Mbale town), 266 inh/km² in Sironko district and 111 inh/km² in Kapchorwa district. It can be as high as, 1000 persons per km² in the Manafwa valley (Charlery de La Masselière and al., 2009, François, 2006). In Rungwe, the number of inhabitants per km² is lower, the average is 150 inh/km². We have higher values in Ukukwe area, close to Tukuyu with 372 inh/km²⁹. Although the demographic pressure is an old phenomenon, it is heavily felt on lands. In Rungwe and in Elgon, the land is traditionally divided between all the children of a family. This has led to extreme

⁵ Uganda Bureau of Statistics, 2002 National Census. Since this census, three districts have been created in the formal Mbale, Sironko and Kapchorwa districts: Manafwa, Bududa, and Bukwa. 2002 ward limitations have been chosen because of the availability of population data which are provided by the 2002 census and for facilitating the perspective put between the two sites.

⁶ URT (2003), 2002 population and housing census-General report, Dar es Salaam.

⁷ Mbeya town has the triple function of Regional, Urban and Rural headquarters. Mbalizi is mentioned in this table as the second urban centre, it is located in Mbeya Rural, 10km west of Mbeya town.

⁸ The rates are -3,2 in Mbale district, -2,7 in Sironko district and -0,6 in Kapchorwa district. Uganda Bureau of Statistics, 2002 National Census. This report indicates « recent migration ».

⁹ URT, Rungwe District Council (2010) *Rungwe District Investment Profile*. 33p. Data from the Population National Census of 2002.

land fragmentation. This situation of land scarcity is less in Rungwe due to emigration, especially youths leaving for “greener pastures” in Mbeya city or in smaller urban centres. Most of the population is rural, urban population does not exceed 10% in Mbale district and 15% in Mbeya area (without considering Mbeya Urban district). The population is mainly engaged in agricultural activities.

The population depending on agricultural activities is very high in both rural and urban areas. Indeed, according to official data, more than 80% of Ugandans depend on agricultural activities and even more in Elgon. In the Rungwe, 90 % of the population depend on agriculture. 40% of Mbeya metropolis inhabitants are engaged in agriculture and petty trading (Foecken and al., 2004). The economy of the two sites is structured on agriculture which has adjusted to recent modifications of economic environment.

1.2 The adjustments of agriculture to the market environment

The shifts of agricultural productions

Agricultural features of Elgon and Uporoto are in a transitional phase, from a formal model of traditional cash crops and food crops, to more complex farming systems characterised by a wider opening to the market. East African Mountains have been drivers for national economies since the colonial period. They produced coffee and tea (among the more important crops) which contributed to the construction of mountain societies and integrated them to the market (Charlery de La Masselière, 2005). Since the 1980s, Uganda and Tanzania have experienced several structural adjustment plans encouraging the disengagement of the state in many sectors, agriculture among them. This meant the end of state support to the sectors leading to market uncertainties and as a consequence agricultural rents collapsed.

In this context of liberalised markets, with regard to the increase of urbanisation, mountain areas engaged in commercial food crops. Traditional food crops (e.g. banana) became both a food crop and a cash earning crop. In addition to this evolution, horticulture developed. Those movements are some responses to modifications of the economic environment and to the peasants’ need of obtaining money. Coffee did not disappear in Mount Elgon. It is the main traditional commercial crop that effectively developed in Gisu land from the 1920s. For the last three decades, its cultivation varies according to the market price fluctuations. In Uporoto Mountains, the evolution of coffee is quite different as official figures show a rise of production. According to the Mbeya Regional Office of Agriculture, the area of coffee production decreased by 7% between 2003 and 2010. The general trend is the abandonment of coffee production although the coffee trees are not always removed: in the slopes of Mount Rungwe, the planted area is stagnating but the production has decreased by 48% from 2002 to 2010.

Tea is the second traditional cash crop in Mount Rungwe region. It was introduced in the early 20th century by the Germans at the Kyimbila mission and its production also fluctuates with the market prices. According to the same official source, planted areas reduced but production increased in the last 11 years. This can be understood with the improvement of the industrial sector. In the Uporoto highlands, pyrethrum’s production has strongly declined during the past decade because of marketing problems; nevertheless in 2002 Tanzania is the world’s second producer and Uporoto Mountains used to produce more than 90% of the national pyrethrum production. 95% of local crops were sold to Mafinga factory in the Iringa Region. The National Pyrethrum Board ceased functioning in the 1990’s and private businessmen were not able to buy the products. As a consequence, farmers started growing round potatoes

intensively because in response to a rising urban demand. Planted areas of pyrethrum decreased by 46% from 2002 to 2011. This spread of agricultural change takes place partly through a phenomenon of reproducing the “neighbour’s success”, i.e. if a neighbour cultivates a new crop which performs well in terms of yield and revenue, the surrounding peasants adopt the same model. Peasants have adapted their farming system to the modification of the economic environment by shifting to more profitable crops (Mwakalobo, 1997; Ponte, 1998; Sokoni, 2001). Peasants can adopt intensive and costly crops using chemical inputs if there is a market, and if there is no other commercial opportunities. For example, round potatoes and cabbages have been adopted in Uporotos highlands though they require many inputs. Agricultural shifts are processes responding to the increase in urban demand and to marketing opportunities providing potential new sources of income. It is worth noting that shifts do not mean the end of traditional cash crops. It is rather a diversification strategy in order to reduce risks. In Mt. Elgon, coffee trees are replaced by young plants that are intercropped with annual crops. In Mt. Rungwe, although the majority of the peasants do not care anymore about their coffee trees, the plants remain in the field. *Coffea* is still visible in the landscape contrary to pyrethrum (*tanacetum cinerariifolium*) which is an annual crop. Producers follow market conditions, peasants’ agricultural strategies are defensive, and they are in a wait-and-see position (Charlery de la Masselière and al., 2009).

The shifts of the farming systems

Farming systems in both mountains present some similarities in practice of intercropping. In Mt. Elgon, coffee is planted with banana, cassava, beans, vegetables and fruit trees. In Mt. Rungwe, main crops are banana, maize, beans, sweet potatoes, cassava, fruit trees, and tea is found at altitudes ranging from 1000m to 1600m. The horticultural areas with round potatoes, cabbages, carrots, tomatoes, peas, beans and onions are above 1600 metres. Maize is the major crop in Mbeya area (in terms of tonnage and of planted area), the cereal *zea mays* is used to cook the traditional staple food called *ugali*¹⁰. A Shift in agriculture is a relevant indicator of urban-rural linkages and of changes for the conditions of access to markets.

The farming systems refer to peasant agriculture, i.e. small units of production mobilizing mainly family labour working on a small cultivated area and using limited inputs. The peasant agricultural model is based on an “organisation of ways of life and of production characterised by close ties between social and economic activities and within the family structure and local conditions” (Courade, Devèze, 2006: 5). However, the modifications of the economic environment and of conditions to integrate to the market have led to processes of individualism. The agricultural model is forced to adjust to the liberal and uncertain economic environment. In other words, the agricultural model is in a transitional phase. In Uganda, peasant households have 1.5 ha (Uginet, 2005), whereas in Rungwe the average planted area per household is 0.9 ha (2,27 acres) (Charlery de la Masselière, Racaud, 2012). According to the field works realised from 2008 to 2011, in Uporoto Mountains, 44% of the peasants owns 1 acre¹¹, 39% owns 2 to 3 acres, 12% owns 4 to 6 acres and 5 % owns more than 6 acres. More than three quarters of Uporoto farmers work in scattered small plots: 39% work in 2 to 3 plots, 27% work on 4 to 6 plots, 12% works in more than 12 plots and 22% work in only one plot. These figures compared to the figures concerning the number of acres per household indicate that the sizes of the plots are very small. Ancient agricultural collective tasks are declining since

¹⁰ *Ugali* is a dish of maize flour (cornmeal) cooked with water to a porridge- or dough-like consistency.

¹¹ 1 acre is 0,40ha, i.e. a 63mX63m square (4000m²).

the intensification of the insertion to the market. Cosmas Sokoni (2001) analysed how the traditional terraces used to control land erosion in the Uporoto highlands and have been abandoned as a consequence of the decline of collective tasks; processes of individualism in working organisation indirectly produce land erosion (Sokoni, *Id.*). 30% of Uporoto peasants use paid labour. This figure indicates the penetration of the cash economy in the rural areas, diminishing traditional collective action and changes in crop type.

Spatial consequences of the agricultural shifts

Changes in farming systems have led to some processes of production zone specialisations such as Mount Elgon, the sub-county of Wanale specialised in horticulture. This zone took advantage of the very good natural conditions and of its proximity to Mbale. Horticulture (carrots, cabbages, tomatoes, etc) became the new main type of agriculture; it exports an average of 24 tonnes per week to Kampala via Mbale, (Charlery de la Masselière and al, 2009). In Uporoto highlands, Iwalanje is specialised in carrot production, Simambwe in cabbage production whereas Ndaga and Ntokela became the main supply centres for production of potatoes. During the peak of the harvesting season, about 150 tonnes of round potatoes are supplied by Ndaga and Ntokela per day¹². Production of potatoes has radically changed the landscape which is continuous. Because of the proximity of the main road, the demand for land greatly increases. Many investors from urban centres compete to hire some pieces of land. This represents some opportunities for peasants with less capital to grow potatoes. From a status of patrimony, land becomes a resource and can be sold as a last resort (Charlery de la Masselière, Rcaud, 2012). Specialisation and competition increased the prices of land. There is a strong difference of prices of lands between remote areas and fields close to the asphalted road: one acre costs 400 000 Tsh¹³ in Umalila whereas one acre costs 2 000 000 Tsh in Ntokela. The difference is even more when hiring a land, it ranges from 16 000 Tsh in Umalila to 100 000 Tsh in Ntokela. Umalila is located 30 km from the tarmac road whereas Ntokela is situated on the tarmac road. The proximity to the main infrastructural networks can modify the land management practices, the farming systems and the conditions for the integration of the production areas into the markets. This current phenomenon sets some imbalances between the production zones according to their accessibility (Rcaud, 2013).

Relatively inserted to the market through traditional cash crop, the farming systems adjusted to modifications of the market environment. The adopted changes are some responses to the modifications of the economic environment. Changes appear to be more results of forced adaptations rather than innovative strategies. In a context of state disengagement, commercialisation of means of production, of the liberal economy, etc. peasants have no alternative but to follow the new rules imposed by the market. The transformations of the farming systems led to mutations of the landscapes and of the status of the land. Changes result in the insertion of a wider variety of actors, among more and more places.

2 COMMERCIAL EXCHANGE PLACES AND FOODSTUFFS CARRIAGE

¹² This figure has been calculated from the number of lorries and paid taxes on the 4 august 2010. I collected the number of lorries and the amount of paid taxes from the road check point located on the B345 road crossing Mount Rungwe. Each bag of 100-120 kg is taxed up to 1000 Tsh. On the 4th august 2010, the total amount of collected taxes was 1 286 000 Tsh, this means 1286 bags, considering an average of 110 kg per bags, we deduce 141 460 kg. Taxes are collected for the district which gives back 15% to the village and 5 % to the ward.

¹³ 400 000 Tsh = 186 EUR; 2 000 000 = 931 EUR; 16 000 Tsh = 7 EUR; 100 000 Tsh = 46 EUR.

The modification of agricultural models disrupted the flows between the production areas and the actors of the exchange systems. The recent organisation involves widened interactions between places and actors. The exchange system has become much more complex and access to market issues arises.

2.1 Commercial exchange places

Jean Louis Chaléard (1996) points out that market places are privileged places of peasant-trader contacts in rural areas, and places for food supply in towns. He defines a marketplace as “any form of exchange concerning all commercial surface [], it is above all a physical place for exchange” (p. 493). It is interesting to state that the market is a mechanism for interlinking demand and supply. The meeting between supply and demand takes places in different types of exchanges places.

Roadside markets

The roadside selling places are more or less structured according to the number of vehicles which determine the number of potential customers. The traffic is more important on major roads, consequently the more structured roadside markets are located on asphalted roads. The roadside markets are mainly permanent, but some less structured markets are located along roads with periodic markets on market days (*gulio* in Swahili). The increase of traffic due to the market days increases the number of potential customers. Some farmers bring their products to these informal markets in order to take advantage of the rising traffic. Permanent roadside markets are usually more important when they are located at road junctions. Sometimes, some shops are adjacent to the displays of foodstuffs. This gives a more formal picture to the market but in the majority of cases, there are no “hard-shell” structures. The products are packed in bags, in buckets or in piles. Sales are mainly carried out by youngsters and by women who are both small traders and farmers. They share their time between the field and the roadside market. In Ntokela roadside market, during the harvesting season, they sell on average three to four buckets of potatoes per day. Roadside markets reflect the local production of the fields of the surroundings, as is the case on the road B345 for Iwalanje and Simambwe that are specialised in carrots and cabbages respectively. Other “secondary” selling places are located at police checkpoints where many sellers, principally women and youngsters try to sell some produces to the passengers of the vehicles. The district office of trade does not manage and does not collect any taxes from this type of markets that are not formally regulated.

Structured marketplaces

The structured market places are spots of exchange equipped with built structures and ruled by a formal organisation. Many market places are found in East African Mountains. They play a determining role for the urban-rural linkages, for the integration of the mountainous agriculture to the market and for the opening up of the mountain. “The geography of town food supply and of town food distribution in Africa is also the geography of market places” (Hatcheu, 2006: 49). They have different positions in the foodstuff market chains. There are seventeen weekly markets in Sironko and Kapchorwa districts, ten and seven respectively¹⁴. Data for Mbale district were not found, nevertheless, arguments may be made that in Mbale district there

¹⁴ Mukwaya P., (2008) Field report, CORUS 6165 Programme - MOUNTAINS AND MEDIUM TOWNS IN EAST AFRICA. Unpublished.

would be a dozen of weekly markets. In Mbeya Urban, Mbeya Rural and Rungwe districts, there are thirty nine periodic markets. These markets are registered by the districts which collect taxes. There are also several unregistered small periodic markets. Daily markets are located in urban areas, for example Mbeya town counts twelve registered daily markets. It may be noted that some daily markets can have a special market day during which there is an increase of activities (Mbalizi, Inyala in Mbeya Rural district). Most of the markets begin early in the morning (around 5-6 am) to the middle of the afternoon. There are also evening markets, located in urban areas in Mount Elgon.

The spatial organisation of the markets varies in function to their history, to their environment and to their importance. Older ones were built during the colonial period (in Mbeya town: Sokomatola in 1955, Uhindini in the 1950's; in Sironko district: Budadiri in 1944) or just after independence (Santilya in 1963 in Uporoto Moutains). They are characterised by a geometrical layout of brick buildings. The semi-permanent stalls built with wood planks and with corrugated iron roofs. Generally all the markets are divided in different parts specialised in a type of product such as: fish, vegetables within which there are some subdivisions, part for cereals and dry starchy food, etc. Some markets have a roof that covers almost the entire space. The foodstuffs are sold in some stores (for daily markets), tables, or displayed on the floor, packed in buckets, in baskets or in bags. The number of tables is higher than the number of stores, for example there are 606 tables and 138 stores at Uyole market in April 2010. Globally, the centre is more structured than the fringes, the markets' outer fringes have less formal displays. There is a kind of concentric organisation of business, informality increasing with the distance from the centre.

Fig. 3. Kiwira market (left) and Ibililo market (right), (Racaud, 2010)



The management of the markets consists mainly of maintenance and tax collection. Taxes are collected by the sub-counties in Uganda and by the districts in Tanzania. In Mount Elgon, the market controllers are assisted by the sub-county in the management of the organisation of the markets, whereas in Mount Rungwe, district trade officers confessed that it is up to the local leaders to manage the markets. For example, there is no regulation of the market day planning and there are no specific rules for organising periodic markets. The most common organisation for the periodic markets is a committee composed by a chairman, a secretary, a treasurer and 3 to 8 members, all elected for 3 to 5 years by farmers and traders involved in the market. In the absence of a political regulation the market depends solely on market forces organising the food supply of towns. Rising urban demand is a major factor for supply of foodstuffs and it is a driver for the structuring of market networks.

The increase in number and in physical size of markets can be understood as an indicator to shifting agricultural models, in other words as responses to market opportunities. Marketing activities vary with the seasons. The contrasts of marketing activities between the harvest and the low seasons are very high¹⁵. In Uporoto Mountains, six markets have been created since 1998, far in the countryside and along main roads. The Ibililo market place started in 1998. Before its creation, the farmers and the traders used to do business in the nearby important market located in Kiwira. This latter, with regards to the amplification of its activities, moved in 1985 from the ancient site occupied since the 1950's to a larger site. This place of collection and of redistribution is very closely linked to the Rungwe production zones, with the Rungwe markets and with some distant markets. This hub of exchange plays a structuring role in the market system of the local production regardless of its level in the urban hierarchy. Kiwira market has about 1000 agents (with about 700 local farmers); it is five times more than Tandale market located in Tukuyu, the headquarters of Rungwe District. Other markets are new, such as Isuto in Uporoto (Umalila zone), located far from the main road, or such as the second market in Mbalizi close to Mbeya. In both rural and urban areas, the market system is growing and becoming more complex. The organisation of the markets system is hierarchical. Its different stages depend on the volume and type of exchange between the markets. Some markets have local influences whereas others are directly linked to Dar es Salaam markets such as Mabibo, Tandika, Buguruni. In Mount Elgon, Kamus is a village with 3000 inhabitants. During market days which take place on Wednesdays and Saturdays, they can have a population of 10000 people. Consequently, authorities had to set a branch in Kibanda four kilometres from Kamus because the original market site was saturated. Market places are some go-between in a larger hierarchical market system. They promote the rural and they allow the opening up towards the urban.

In addition to the evolution of markets, some processes of market specialisation are under way and market places reflect their hinterland. In Mount Elgon, Chebonet (1800 m) is a specialised collection centre for cabbages while an informal sugar cane market is held at the Moroto-Kapchorwa crossroad (1100 m). In Uporoto Mountains, Kiwira (1400 m) and Ibililo (1350 m) are specialised collection markets for bananas. Kiwira is located on the main road and is the more important market of Rungwe. In those markets, traders come from distant areas to collect their products coming from the surrounding areas. Major markets as Kamus in Mount Elgon, Kiwira, Uyole and Mbalizi in Uporoto Mountains are important collection and redistribution grounds. Their importance in the network of market places is based on their attractiveness. The latter partly depends on the availability of products and on their physical accessibility. Infrastructures such as road networks are a key factor which contributes to the attractiveness of a market. As mentioned above, specialised production centres developed in Uporoto, as a result, they became specialised collection areas of round potatoes. The evolution of production and the structuring of market networks contribute to the redefinition of the identity of mountain areas. Some mountainous territories are associated to a product which influences their integration to the market and the entire territory. This is not contradictory to the previous model. The current phenomenon is a continuation of the former model of integration although the economic, politic and social environments have changed. In other words, mountain agriculture is still embedded in the global economy but through more complex interactions. The transitional period indicates the capacity of farming systems to adapt to fluctuating situations. The functions of markets are not only commercial as other things are exchanged during market days.

¹⁵ The contrast can be measured by the difference in the volume of flows: for example the number of lorries can vary from 1 to 7 according to the season for a rural weekly market in Uporoto Mountains.

Weekly markets also make up major exchange sites. They are also points where social exchanges take place. The functions of the market are not limited to commercial, the social function is as important as the commercial function (Chaléard, 1996: 495). Farmers coming from the surrounding areas meet each other during the market day. They sell their products (coming from their own fields or bought in rural areas) and then they purchase the goods they need for the household. When the market activities are over, they can take advantage of some urban services (like administrative services if provided in the urban centre) and/or “maximize their displacement”, for example by beer drinking. Local brewed beer drinking has been observed in several periodic markets in rural areas, especially when the market day is on Sunday. *Pombe* quench the thirst and give strength to people before they go back home. This short example illustrates the social functions of the markets which are also places where people exchange news, receive and transmit information.

Densification and specialisation of market places and networks are indicators of the integration to the market of mountain areas. The emergence of new market places facilitate urban-rural linkages, those hotspots of interactions are both causes and results of their constitutive dynamics which is based on the amplification of agriculture within the context of urbanisation.

2.2 Access to physical markets and collection processes

The modifications of interactions between production zones and the market have brought raising issues about the flow of foodstuffs. From farmers’ point of view, it is an issue of access to market; from traders’ view point, ensuring collection of produces is at stake. Tacoli (2002) notes that access to the market is a critical issue especially in a context of state withdrawal in agricultural production and commercialisation. Access to markets change according to farmers’ choices/opportunities of market outlets and according to farmers’ capacity to have access to the “physical infrastructure (road network and affordable transport; storage and processing facilities), to the market relations especially power relations between different actors (producers, traders and consumers), and access to information on how markets operate” (Tacoli, 2002: 3). This section presents the conditions of agricultural products’ collection and carriage, the issues of access to information is treated in the part 3.3.

Market places play a structuring role for facilitating foodstuff flows. Transaction hotspots are spaces where some complex varieties of actors meet. They have a key role because the mountainous road networks do not facilitate flows; foodstuff collection is heavily dependent on road networks which are in very bad state. Access to rural areas is time consuming whereas the distances are short. The poor roads increase the risk of the quality of vegetables. During the rainy season, movements are even more difficult, some vehicles get stuck in the countryside and foodstuffs can perish on the way. The road networks in the two mountains are quite similar with very limited number of asphalted roads. In Elgon, the asphalt road goes up the mountain and ends at Kapchorwa. The other roads are rough roads linking high altitude villages. In Mbeya, the Tanzam¹⁶ road crosses Uporoto horizontally whereas the tarred road (B 345) links Mbeya to Malawi; the latter lies along the slopes of Mount Rungwe. In mountain areas, transportation of people and products circulate on the rough roads networks more or less connected to the asphalt road. Transport means change according to the location, to the capital and to the volume of the products. The different modes observed are by foot, by bicycle, by handcart, by old pickup, by local collective transport (i.e. small buses) or by lorries: mainly 7.5

¹⁶ Tanzam is the highway linking Dar es Salaam to Lusaka.

tons “canter”, 15 tons “fuso” and heavy trucks able to carry up to 30 tonnes. The latter only circulate on the tarmac road.

In the mountain areas, the foodstuffs are brought to the market by farmers and by local traders. Peasants going to a weekly market come from the surrounding area; generally they bring their products by foot. Some of them wait along the road for collective transport vehicles which can be small buses (called “daladala” in Tanzania) or some lorries playing the role of transport of people and of goods.

Fig. 4. Lorry transporting some goods and people from Mbalizi to Santliya (Racaud, 2010)



Products brought by local agents are carried by foot, by bicycle or by vehicle, depending on the quantity, the capital, the location and distance. Some local agents employ local transporters who bring the products from rural areas to market places. There is hierarchy in the organisation of foodstuffs chains: local traders bring from farms to local markets from where more important traders collect and export to urban markets. The table below presents some indications concerning the variations of flow in two specialised market of the Rungwe.

Table 2 Variation of flows according to product’s specialisation for weekly markets in Uporoto Mountains

Market	Major produces	High season, Nbr. fuso ¹⁷	Low season, Nbr. fuso
Ibililo	Banana	5 to 7	1 to 5
Tandale	Avocado	6 to 8	0

Banana is harvested all year round while avocados are exported during the harvesting season. There is a strong link between the local crops, specialised markets and the amount of flows. Variation in the flow of banana could be explained by its more or less commercial characteristic. Furthermore, several national production areas compete; the geography of

¹⁷ A “fuso” is a lorry with a capacity of 7 to 15 tons.

traders is the geography of the availability of foodstuffs. The issue of attractiveness is a central point for participating to the exchange system, i.e. to integration to the market.

Weekly markets represent a major opportunity for local farmers to get direct access to the market. Ibililo is not located on the asphalted network but this village attracts traders from distant areas (Mbeya, Iringa, Dodoma, Dar es Salaam and even from other countries) in search of cheap prices. Prices are higher in the nearby major market called Kiwira that is located on the tarmac road. Some traders also come at Ibililo in search of specific local products: one of the four main banana varieties grown here is directly sold in Dodoma. The destination and the type of marketing chain change according to the type of banana. Six banana varieties are found at Ibililo: *Uganda*, *malindi* and *mshale* are sold in the Tanzanian market; *mzuzu* and *mkono wa tempo* varieties are exported to Zambian biscuit factories and *haradoni* type is processed in Botswana distilleries.

The lack of accessibility is a key constraint for weekly markets located on rough roads; consequently food prices are lower because of excess supply. The majority of farmers have no access to other markets because they don't have capital to transport their produce, as a consequence, they are forced to sell with limited possibilities of bargaining. Traders take advantages of the accessibility problems. They have capital to transport and to store produces whereas the majority of farmers do not have enough capital to sell at a more profitable distant place. Middle traders usually shared the transport costs. For example, some traders from Mwanjelwa market in Mbeya town share by five to seven the transport cost between Ibililo and Mbeya. Lorries coming from distant areas such as Iringa or Dar es Salaam are generally rented by one or several traders. Those traders have capital for moving themselves from one market to another to load the requested amount. Meanwhile farmers are not collectively organised to bring their harvests to the market. Location affects more farmers than traders for access to the market.

If weekly markets are major centres of collection and redistribution, they are not exclusive collection points and a significant part of the exchanges are done on the farms. Many important traders collect directly on farms after supply agreements. Access to the market and the balance between costs and revenue, influence the farmer's choice for the commercial outlet. The lack of capital is a major constraint to access to the market. According to the market chain within which a farmer is engaged, he has to carry out a certain number of marketing functions: packing, transport, physical handling, storage, financing, risk-taking, information, experience, negotiation and payment (Dijkstra, 1999). Each function has a cost, sales on the farm reduce costs, sales at the nearby market or at a distant urban market have varying costs. Some are constant and others vary according to the volume of goods. In the research areas, farmers sale on their farms, along roads and structured market places. On the farm sales are the cheapest and the simplest way of marketing. This option is not really chosen, it is adopted by farmers with limited finances which hinder them from performing further marketing functions such as packing, storage or transport which could increase their profits. For small scale farming systems this option can be the most profitable. We tested this assumption with Tjalling Dijkstra through a cost-revenue analysis with small scale farmers in Kinangop (100 km to the north-west of Nairobi) who sell on their farms to wholesalers rather than taking their products to Nairobi (Dijkstra, 1999). In some cases, there can be some costs of transport from the field to the farm. Fields are generally nearby the farm but as shown above, many farmers cultivate several fields and sometimes the parcels are not located in the same zone. Nevertheless in most cases, the fields are far from each other. "Packing" consists of gathering products and rendering them visible on the field or in front of the house. Onions, cabbages, carrots and potatoes are cleaned or brushed in order to be attractive. For highly competitive crops, transactions are often done

before harvesting. Some buyers prospect in rural areas before the harvesting period. In Uporoto, some buyers proceed by paying in advance to secure supply; it is the case for potatoes and cabbages. The money is used to pay part time labourers for the harvesting.

Characterised by the wide range of varieties, market places remain hot spots of exchange despite the defective transport network. The network of the market places becomes denser as a process of adjustment to the economic environment and to the market opportunities. The specialisations of the market places are indicators to the market integration. The difficulties for accessing the market represent a constraint to flows, and they consolidate the inequality in terms of power relations between the different actors. These aspects are representative to an imperfect market.

3 Fluctuating exchanges modalities: rising uncertainties about integration?

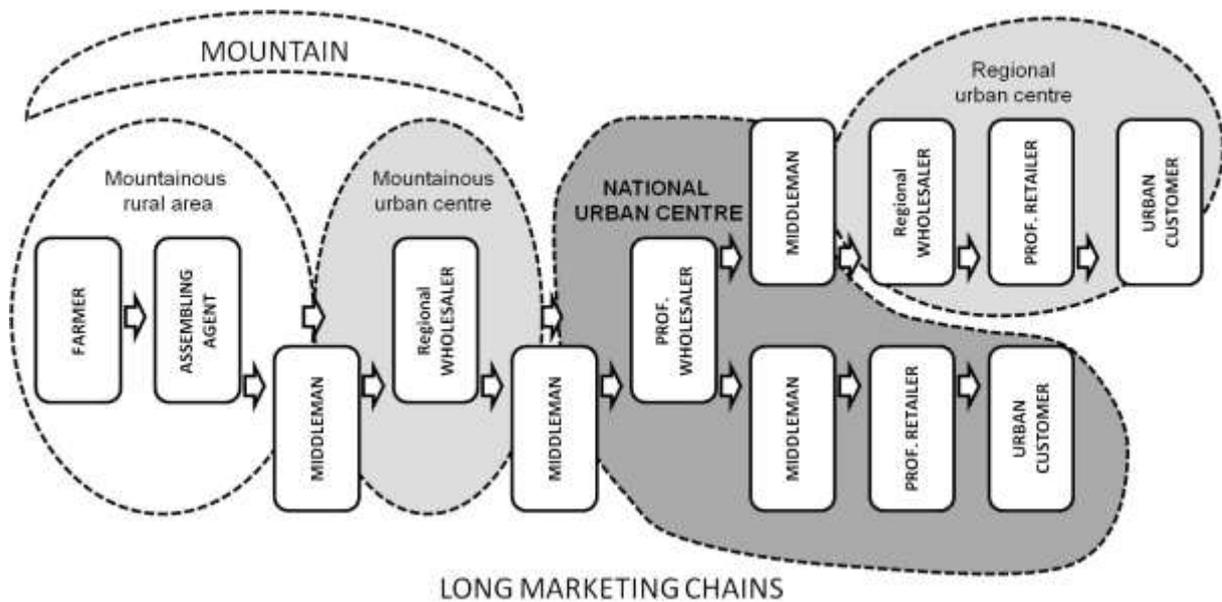
The commercial food crop market chain is fragmented with different forms and actors. Price determination illustrates uncertainties of an imperfect market that provides ample scope to the private sector. Moreover, the defaults of the market result in the prices volatility of non-standardised produces.

3.1 Plethora of marketing chains forms and of stakeholders

Multiple fluctuating forms

Marketing chains are more than commercial food crops, for the same product. There are several chains which change according to the market opportunities which are very unstable in the liberal economic environment. « Markets in Africa are highly fragmented. Food products are sold in small quantities, and there are many steps in the value chain between the producer and the consumer ». (RTI, IIRR, 2008:11). Short marketing chains coexist with a wide range of chains changing according to the number of actors and stages involved in the marketing process. Short chains have limited transactions in local weekly markets where some producers sell directly to the local consumers. A second type of chain includes the farmers and retailers. There are several types of chains with larger or smaller number of stakeholders. The sketch below presents what could be the more complex form.

Fig. 5. Long marketing chains of commercial food crop (*e.g.* potatoes, banana, etc.)



This sketch can be divided in simpler forms, according to many factors such as the products, the places, the season, the market conditions and the household's conditions. Each of those factors is variable. Note that, this sketch shows the longer chains¹⁸ and that there are several shorter chains within the mountainous urban centre. What is important to note from this sketch is the impressive number of stakeholders between producers and consumers.

Round potatoes in Uporoto Mountain aroused much interest among producers and traders. This commercial crop is sold to distant markets like Dar es Salaam, Lusaka, etc. Commercialisation processes involve many stages. Farmers in the Uporoto highlands grow potatoes twice a year. Most of the times, before the harvesting period, many agents investigate in production areas in order to ensure the supply. They are commissioned either by a middleman, or by a wholesaler, both of them generally located at Uyole, but some can be located in distant town such as the Tanzanian capital. Potatoes are collected on the farms and stocked in one of the numerous stores at Uyole. Then, the potatoes are transported to a professional wholesaler in Dar es Salaam, generally located at Mabibo market who distributes to professional retailers. From Mabibo, potatoes are also transported to other regional urban centres and to Zanzibar. This example shows that not less than seven stakeholders exist between the producer and the consumer located in Dar es Salaam. This form, characterised by many stages also applies to banana, beans and maize.

Banana chain can also be long when supplying distant urban areas. Generally, local collecting agents investigate on the farms in order to fulfil an order given by a wholesaler, or a middleman. This latter links the urban distributing wholesaler located in the mountainous urban centre such as Mbeya, to wholesalers located in the regional headquarter such as Dodoma, Iringa, or some wholesalers located in Dar es Salaam. This list is not exhaustive; one can add that a middleman located in the mountainous urban centre can be connected with foreign traders. As mentioned above, the number of possible shapes of chains is important. To get back to chains crossing Dar es Salaam, bananas reach Mabibo market and from there they are

¹⁸ This means that the chains “mountainous rural area - mountainous urban centre - regional urban centre” is not presented here.

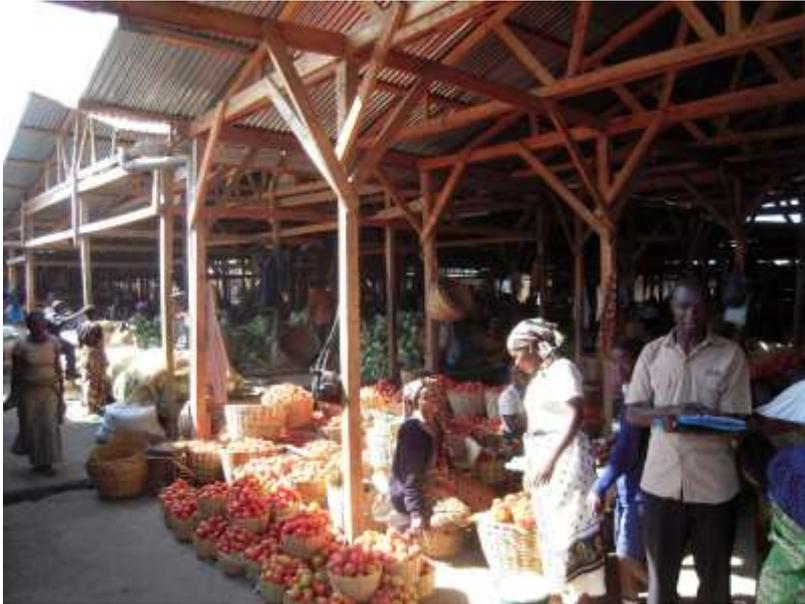
distributed to the markets of the capital city, to other regions or to other countries (*e.g.* Comoros, Seychelles).

In Mount Elgon, there are many vegetable chains. A carrot chain operates between the production zone and the Ugandan capital. The carrots are collected by some local traders, then they clean the carrots in a small stream along the Mbale-Bufumbo road, and next they load the bags in a lorry. It is to supply Kampala, more precisely Nakasero market and Udino market 250 km away. Traders collect early in the morning on Sundays, Tuesdays and Thursdays. There is a cabbage chain between Sipi (nearby Kapchorwa) and Juba located in South Soudan 530 km distant. Within the mountain area, many commercial food crops chains fits together in an exchange system involving several places and actors. Those examples concern chains of perishable goods which have to be sold quickly, thus reducing the length of the chains. Concerning maize and beans, chains can be longer because of speculation which is very important. Crops can be stocked in the mountainous urban centre or in the major urban market. Brokers stock huge quantities in order to increase the prices in urban areas. Additional complexity refers to uncertainties about the flexibility of the chains' shapes.

Changes in a chain illustrate the uncertain nature of the market; as a consequence, the exchange system is very flexible. Changes occur within households and within market places. Within a same household, several ways of marketing a produce can coexist. The change is possible if a producer has a capacity to choose. This means he must have some capital to transport the production, or to move to meet traders out of the farm gate and out of the village. This is also possible when farmers are not in urgent need of cash. The decisions vary according to the prices proposed by the assembling traders and according to available resources. This illustrates the issue of access to the market; *i.e.* to the physical market and to information. To be able to take such decision, a farmer needs to know the market price. Otherwise he/she takes the risk. Proximity to the market and transport constraints influence decision making. Farmers' choices also depend on the market situation; with their forecasts based on the number of collecting agents looking for foodstuffs.

Seasonality is also a factor influencing chains. In Mbeya, tomato supply change with the seasons: from May to October. Farmers look for market opportunities, to the Uyole collection centre in Mbeya or they announce to the Uyole traders that harvests are ready. Farmers can't sell directly to consumers because they are not allowed to have stands in the market. The market organisation prevents direct contact between the producers and the urban consumers.

Fig. 6. Vegetable sector in Uyole market (Racaud, 2010)



From November to April, Uyole traders look for tomatoes, they go to production areas to collect. The demand for banana in Dar es Salaam increases in Rungwe from September to December, as a consequence the number of traders looking for the produce grows in remote areas such as Ibililo. In addition to the multiple forms of the commercial channels, there are extensive and varied actors.

Myriad stakeholders' types

Different stakeholders interact in the commercial food chains illustrating the complexity of the exchange system. Flexible and plural characteristics of the channels can be explained by the liberal economic environment. In the absence of a formal institutional structure of regulation, it is up to private actors to manage exchange. The farmers undertake the productive function while many individuals try to take advantages of the increase of the commercial food crop business. Some play a key role for linking the produce to the market. Two examples of businessmen are presented to show the diversities and the complementarities of those key actors of the commercial channels.

The small scale local assembling agents are individuals originating from the production basins. They have the knowledge about the local environment; they know where to find products in the remote areas. They link the peasants to the market by making commands on behalf of middleman, or wholesaler. They exchange average quantities of products, *e.g.* some are able to collect about 150 banana bunches per week. They promote to local development by encouraging exchange; *i.e.* incoming flows of money. Their status is fragile: their function is based on the market condition. If there is a high demand, the urban wholesalers use them, but if the demand is low, they are jobless and they confine themselves to their farmer's status. Indeed, most rural assembling agents are also farmers. They have been selected because they are farmers and they have knowledge on agriculture and on the local area. Mr. E. lives at Ibililo, he used to cultivate bananas, coffee on one acre and beans on one quarter of an acre. In 2008, a trader from Dar es Salaam came to the village in search of bananas. He needed to be guided and thus he employed Mr. E. like an assistant. They collected together, and trust has grown between them. Then the business man assigned Mr. E. to be his assembling agent. A local agent can work for several traders: in 2010, Mr. E. worked for nine traders. He used to collect on average 150 bunches of banana per week. There is no exclusive contract as there is no formal

contract, thus no guaranty. The relationship is based on trust. Generally, he has two days to collect bananas after being contacted through the mobile phone. He investigates, and then he buys the bananas paying cash. Bunches of bananas are harvested the day before the periodic market. On that day, he pays some local transporters to bring the produces to the market, generally by bicycle or by foot. A lorry is sent from Kiwira (where a periodic market hold too) by the trader who pays Mr. E. cash while the lorry is being loaded. The demand fluctuates according to the season. During our fieldwork, (April 2011), Mr. E. had not been yet contacted by any trader. This activity is a seasonal one and it involves about fifty small scale assembling agents.

The second example concerns urban middlemen linking distant urban wholesalers to local wholesalers, or to assembling agents, or traders with transporters. These types of middlemen are “multi-functional”. They are not specialised in a particular crop, they deal with what provides money. They are located at the collection and redistribution major centre in mountain areas. In Mount Elgon, they are located at Kamus and Mbale, in Uporoto Mountains they are found at Mbalizi located on the Tanzam and at Uyole they are at the crossroad between the Dar es Salaam-Zambia and Mbeya-Malawi road. Mr. L. is born in Morogoro, he came to Mbeya in 1999 and he was attracted by the dynamism of agricultural business. He is the connection between important wholesalers located in Dar es Salaam (or other major towns) with under-middlemen, *i.e.* assembling agents. He has no stock and no store; he is the link between individuals situated upstream and downstream of chains. He organises the transportation of the crops. He works with his network of local agents who are his suppliers. He works daily with three to four wholesalers and he sends two to three lorries¹⁹ per day. From April to December he sends up to five lorries, and he is jobless from January to March. More important middlemen are able to dispatch up to ten lorries per day. There are about eighty to one hundred middlemen at Uyole. Their number increases, it may be a sign of the growth of the agricultural business called “boom” by some local actors. These middlemen used to have an office at Uyole but they don’t any more, their office is the mobile phone as they say. Many of them are located along the Tanzam, in front of numerous bars. They know each other and according to Mr. L., they use to collaborate²⁰. Their customers are traders from Dar es Salaam, Morogoro, Moshi, Arusha, Mwanza, Nairobi, Uganda, Zambia, Malawi and D.R.C. Potatoes and banana are the most demanded products from mountainous zones, followed by rice, maize, groundnuts and millet from other districts. They adapt according to the market opportunities, their activities fluctuate at an irregular rate.

3.2 Fluctuating prices

“Space”, as a factor of price fluctuations

Location of transaction places has a direct influence on prices. It is needless to say that prices increase with distance of transaction space from production zones. The distance can be measured by the number of kilometres and the conditions of accessibility, and it can also be seen as the number of stages in the chains, in other words the length of the chain. In the first stages of the chains, the physical accessibility and the distance to the transaction place partly

¹⁹ Those vehicles are 30 tonnes lorries, they can carry 300 bags (around 100-120 kg each) of maize, of potatoes; or 600 bunches of bananas.

²⁰ Two interviews have been done with Mr. L., the first one was led in a bar, the second took place on a bench around which many middlemen went assisting the interview. Obviously there was a good mood among them but the responses were less natural compare to the first time. One can add that the first time the “mood of the bar” and the drinks taken stimulated the communication...

influences the relation between supply and demand. In some remote villages, demand can be less important because of high transport costs and accessibility. As a consequence, prices of local products are lower in remote areas. Meanwhile, 100 kg of round potatoes of *alika* variety costs between 15 000²¹ to 18 000 Tsh in Mwakaleli that is located in a remote area, the same bag costs between 22 000 to 23 000 Tsh²² in Ntokela crossed by the B 345 tarmac road. A 30 km long rough road provides the link between Mwakaleli and the B 345. Remote production places are less attractive because of accessibilities constraints; however, demand/supply ratio is more profitable to demand, *i.e.* to the traders. On the other hand, in easily accessible production villages, there are more traders who come and they have to compete to obtain produces, as a consequence the producers' selling prices are more profitable.

It is obvious that prices increase with the stages of the marketing process, lower prices are in the production zones and higher prices in the final market. The following figures give an insight of the different prices and profits. On the slopes of the Mount Elgon, at Bukumi village, 100 kg of carrots is sold at 35 000 Ush²³, the same bag cost 70 000 Ush in Kampala, the Ugandan capital which is about 250km away. In Uyole, one of the main potatoes wholesalers makes a profit ranging from 1000 Tsh to 2000 Tsh per 100 kg. Along the chains, there are substantial price differences between the production place and the consumer place, the highest difference observed is 65 000 Tsh for a bag of potatoes (15 000 Tsh in Mwakaleli-Uporotos, 80 000 Tsh in Mabibo-Dar es Salaam). The commercial margins are highest for actors found at the end of the chain. One can conclude that the added value increases with the distance from the production basin. In Ntokela, about ten women sell potatoes along the tarmac road. They sit together; they display the potatoes in buckets, the selling unit. They spend the whole day along the road, otherwise they can go to their farms or collect in the environs; their customers are travellers. As soon as a vehicle stops, they rush proposing the produces to the potential customers; although only one or two of them succeed to sell, they keep on sharing a kind of good mood. In July 2011, the demand was higher than supply, as a consequence prices are "better" for them. They buy the bags in the surroundings about 22 000 Tsh and sell them in seven buckets of about 17 kg. One buckets costs 3500 Tsh, consequently they make in principle a profit of 2500 Tsh per bag. The gross margin is low and those retailers complain about the low level of profitability of this business. They confess that the prices fluctuate very often according to the prices in Dar es Salaam "*masoko ya Dar es Salaam ndiyo yanapanga bei ya viazi katika soko la Ntokela*"²⁴. This affirmation indicates that they are subjected by the instabilities of the market. In Tandare market which takes place twice a week in Tukuyu, one avocado costs 200 Tsh to farmers and it is sold at 300 Tsh in a retail market in Mbeya. According to some local traders, during the low season, 100 kg of avocado is bought about 20 000 Tsh on the farm and sold between 50 000 to 60 000 Tsh to traders from Mbeya. Later, it is sold at 80 000 Tsh in Iringa about 300km away. The collecting traders make more profits during the low season. The low offer and subsequently the high demand increase prices. Location is an important factor to determine exchange; the variations in space complement with variations in time.

"Time", as a factor of price fluctuations

²¹ In May 2013, exchange rates are: 10 000 Tsh. = 4.6 EUR (6.15 USD). A 50cl bottled beer costs from 1300 to 1500 Tsh., a basic meal as rice and beef meat (*wari na nyama*) is about 1200 Tsh., an urban "transport ticket" is about 300 Tsh.

²² Field work led in 2011.

²³ Fieldwork led in 2008. In May 2013, exchange rates are: 35 000 Ush = 10.5 EUR (13.6 USD).

²⁴ The market in Dar es Salaam controls the prices of potatoes in Ntokela.

There are very important variations of foodstuffs prices between the high and the low season. Agriculture in such production systems is strongly dependent on the weather: bad harvest (low quality, low quantity) has an impact on supply and consequently demand. For a production basin, the high season is the period during which this zone is the main supplier of foodstuffs for the market. For example, Mbeya supplies bananas from September to December and potatoes from July to December in Dar es Salaam. During those months, the number of traders increases with production. The different natural conditions and particularly the altitude, influence the durations of cultivation and harvests. As a consequence, many agro-ecological zones are complementary and they extend the duration of the high season, *i.e.* the high supply period. The complementarities play on the mountain scale between the different production zones and at the national scale, between production regions. For example, bananas supply in Dar es Salaam is ensured by Mbeya from September to December, by Morogoro from July to September, by Moshi from March to June and by Kagera from June to September. As a result, the varying relation of supply and demand in a production zone cause price changes in all the production regions. Table 3 shows the prices of bananas in Ibililo (Rungwe) during the high and low seasons. The differences of the prices are very wide, for example, it ranges from 1 to 10 times for the *malindi* type! During periods of high supply, traders at Ibililo come from Mbeya while during the low season, demand from Dar es Salaam increases competition between more traders thus increasing prices.

Table 3 Prices of bananas bunches, in Ibililo village (Rungwe) in 2010-2011²⁵

Types of bananas in Ibililo (Rungwe)	Prices during the low season in Tsh	Prices during the high season in Tsh
Mzuzu	12000	3000
Uganda	8000	2000
Malindi	5000	500
Mchale	6000	3000

It is worth noting that the high season does not go hand in hand with high price. Increase in demand raises the selling prices for the peasants. This mechanism depends on supply and on the situation at the final market, particularly the one in the national capital. If the market in the Tanzanian headquarter is saturated, the prices in the Uporoto Mountains are low. Figure 7²⁶ presents the rates of change of bananas and potatoes prices between January-February-March and September for the years 2006 up to 2010 in the Rungwe district. The bar chart shows that the variations are irregular according to the crop and to the year. Those variations illustrate the intensity of competition between the traders. This competition was particularly high in 2011 during the severe maize shortage in Kenya and in Tanzania. The price of maize doubled, one bucket (about 18kgs) cost 3500 Tsh in 2010 and it cost 7000 Tsh during the peak of the demand in 2011. Prices dropped to 5000 Tsh after the Tanzanian government prohibited exportations of maize. The demand and supply ratio is visible in the market, the number of traders and lorries indicate the demand. Mabibo market is the main fresh food market in Dar es Salaam, 100 kg of potatoes costs 35 000 Tsh if there are about one hundred lorries. The price rises to 65 000 Tsh if there are about ten lorries. Figure 8 illustrates the general trend of price increase, but this evolution is very unstable. Moreover, price increase in Tanzania follows the inflation trends.

²⁵ Sources: interviews led with some traders in Ibililo in 2011. The prices indicate an average.

²⁶ Datas collected in 2011 in the Rungwe District Office of Agriculture.

The average annual inflation rate was 7.7 % during the 2006-2010 period²⁷. A bunch of bananas which cost 500 Tsh in 2001, can cost 5000 Tsh ten years after. Nevertheless, as illustrated on the graph, prices of potatoes declined during the last two years. This shows the instability of the market. Moreover, prices can change according to the type of foodstuff. The two graphs demonstrate that the variations of prices are irregular.



Fig. 7. % of price variations

Fig. 8. Price evolution

Like in most market places of the world, there can be price changes on the same day. Generally prices of fresh foodstuffs are lower at the end of the day when the buyers are leaving: the decrease of the demand means the decline of the opportunities to sell. This variation is more intense for produce which can't be stored and for sellers for which the market day represents the major means to access the market and the main alternative to meet the demand. The time, grasped at several scales is a fundamental factor to understand price fluctuations.

One can say that several factors come to play in price determination. Uncertainties of prices appear to be structural, and at the same time they are influenced by changing situations. For most products, the quality and quantity also influence prices.

3.3 Accessibility to market rules point out a contrasted integration

Transactions present high levels of informality and reveal power relations of actors. These links can be seen through access to information and to credit. Focus on the basis of transactions highlights problems of non standardised products which characterise an imperfect market. In such economic environment, the middlemen play a key role for connecting the agricultural producers and the market.

Who is this Mr. Price?

From interviews with respondents, it appears that a mysterious big man, certainly located in Dar es Salaam is the one who decides the prices. Everybody agrees that he is

²⁷ Worldbank, 2013.

extremely powerful and invisible... This image of an invisible hand pulling the strings illustrates that price determination of foodstuffs is very obscure. Since the 1980s, several agricultural economic reforms have been implemented. The agricultural market liberalisation was set up, in several stages, in favour of the private sector. Field surveys show that traders appear to be in a dominant position in the marketing chain. 28% of peasants reveal that they get price information from traders who supply from them at the farm gate. Information is provided directly or indirectly during negotiation, by other producers who have already sold their crops. In weekly market places, there are no indications; on the contrary, information is noticed locally through exchange with some traders and with other peasants. 49% of the peasants declare knowing the prices once they inquire in the market place. There is an inequality of force concerning access to price information between actors of the agricultural marketing chains. Access to the physical market implies access to information: the number of lorries and traders is an indicator of demand. Mobile phones play a role for linking consumer and producing places, but this channel is not commonly used by the agricultural producers. The field survey shows that only 10% of them use mobile phones to get price information. The non-possession of telephone, the lack of network, the lack and or absence of electricity in rural areas can explain this low rate. In addition, one can say that getting such information requires appropriate contacts and the peasants may not have the mobile phone number of “Mr. Price”... On the contrary, the traders are very accustomed with mobile phone, the latter being their main working tool. As mentioned above, the power relationships change according to the seasons, prices are less profitable during the peak season, supply is higher than in the low season during which suppliers have to compete and bargain. The prices are “market oriented” following the standard formulation and the expression “the market dictates the prices” is sometimes used by governmental officers. As a consequence, knowing the prices of the market is fundamental to strengthen the capacity of negotiation of an actor. Mr. Price is incarnate in transactions and owes his well-being to the lack of public regulation. Local governmental agents declare that the market is not organised. This means that the state does not interfere²⁸, that is, there are no price control boards. Nevertheless, since 2002, Mbeya and Rungwe districts collect information three times per week, and then the information is communicated to the central administration, but not in the rural areas. People looking for this information have to come to the district office of agriculture (or in the Minister of Agriculture) to get it. According to the officer we met, both producers and traders do not use this system. The example of price awareness is very characteristic of the global problem of agricultural market regulation.

The high informality of contracts

Agricultural production in East African Mountains is deeply characterised by the informality as the contracts are mainly oral and they depend on trust. These contracts are agreements between two actors, *e.g.* between a producer and a trader, or between a collecting trader and a wholesaler. They aim at ensuring the supply of foodstuffs. In order to guarantee the supply, traders make advance payments, which are generally used to buy farm inputs. Other accords are done during the high season just before the harvest, while many collecting agents compete to secure the provision of potatoes and/or cabbages. To achieve this, they finance the harvesting process, *i.e.* the labour costs and they provide the bags. Traders do not pay cash

²⁸ During the field survey, up to 2011, interviews led taught that a project for creation of a board for grains and mixed crop was plan. The existing boards deal with cash crops (pyrethrum board, coffee board, cotton board, cocoa board, etc.) but their efficiency is controversial or at least limited. The information is communicated through the TV, he radio, the newspapers, but there are accessibility problems... One can rightly be circumspect on the effectiveness of this measure, and on the capacity of the government for providing information. At last but not least, prices are only indicative and not restrictive.

systematically, they can pay a part of the total agreed amount, and the balance is paid later, after the collecting traders have received payment from their customers. Credits depend on trust between the two contractors and they reveal the weaker position of the farmers for negotiations. Without denying that traders encounter some constraints from such marketing channel relationships, the farmer is in the most vulnerable position (Van der Lann, 1999). Indeed, once they agree on a forward contract or a pre-harvest credit with a trader, they are trapped into this unique channel of selling their goods. The outlet being limited to one, the power of negotiation is weak. In such marketing chains, in the absence of alternatives, in structural shortage of capital, those contracts represent the main way for accessing to the market for the agricultural producers; however a default choice. Those oral contracts concern all the stages of the marketing chains.

Despite the large quantities and the money at stake, oral commands are done by wholesalers from big urban centres and it triggers the attitude of range of actors. The following example gives a representative picture of contracts between several actors. Mr. D. is a trader who lives in Dodoma, some 700 km away from Rungwe. He supplied banana at Kiwira weekly market for five years. He comes twice or thrice a week during the high season. During each trip, he loads about 600 bunches of bananas (about 15 tonnes). He supplies one big wholesaler regularly in Dodoma without any formal contract. The wholesaler sells to retailers in Dodoma. A typical command concerns a variety of banana, quantity, time limit and price. For example, three days before the interview held on Tuesday (which is one of the two market day of Kiwira), the wholesaler called Mr D made a command of 600 bunches of bananas of the *uganda* variety. According to the oral deal, Mr D. has to deliver the order on Wednesday. Once Mr D. gets his goods, he contacts the local agents by phone with whom he works and he gives instructions to bring the required amount to the market day. Mr D. pays his local agents cash, who buy on credit from farmers or traders. Mr D. is paid after delivery in Dodoma. All these transactions are carried out without any written contract. Despite the informal character of this business, the relations between the agents are often regular, not secure and with no guarantee. The main reason that can break the relation of trust between Mr D. and his agents is bad quality of goods or non-conformity of the variety of the bananas delivered. Other local agents in Kiwira are directly contacted by phone by some wholesalers in some urban centre as Dodoma, etc. The local agents collect the banana in the surroundings, then they load a lorry during the market day and they give the references of the lorry and of the driver to the wholesaler. Once the latter recovers his delivery, he pays his local agents by money transfer under *M-PESA* system²⁹. In such cases, all the transactions are done by phone. In order to ensure the regularity of the supplying, the relations between the actors of the chain are regular, despite the fact that there exist no formal contracts. Moreover, all the types of buyers use differed payment.

The lack of access to credit

Very few actors have the capacity for obtaining capital. Field surveys reveal that less than 10% of producers have access to credit through a bank or a micro-credit structure such as

²⁹ M-PESA system is a system using the mobile phone device to transfer, to withdraw and to deposit money. The M-pesa system has been launched in 2007 in Kenya and in 2008 in Tanzania, it is strongly developing and it appears to be a practical alternative for facilitating flows of money as the remittances and payments without depending on access to bank offices. It contributes to modify linkages between urban and rural areas. See "Morawczynski, Olga; Pickens, Mark (2009). *Poor People Using Mobile Financial Services : Observations on Customer Usage and Impact from M-PESA*. © World Bank, Washington, DC.

a saving and credit cooperative society (SACCOS), which is a micro finance association based on participative management. Although this model of association is encouraged by the government and remains the main structure of micro-finance, many people are sceptical about cooperatives. Their resentment is a result of several scandals in the previous decades. It also illustrates general bitterness against corruption at all scales of power. Another hindering factor to credit is the lack of money and collateral security. In 2011, only 31,319 members were registered in SACCOS in Uporoto³⁰. A SACCOS was created in 1995 in Ntokela, but it closed ten years after because the population did not trust it. Nevertheless, it is a success story in Simambwe, a few kilometres away. The Mkombozi (“Redeemer”) SACCOS that was created in 1998 by a dozen of inhabitants, had 499 members in 2011 and the average contribution of the members is 50 000 Tsh per months. It got several loans amounting to 69.5 millions of Tsh in 2009, and they were expecting more than 100 millions³¹ in 2011. The Mkombozi association provides loans with 3% interest whereas banks provide loans at more than 10%. Although this example is encouraging, many peasants still have no access to capital apart from their own income because of mistrust in cooperative and because they don’t have savings.

The lack of standardisation

Food crops’ marketing in Africa is characterised by the lack of standardisation at several levels: quality, weights and packaging (Van der Lann, 1999). For perishable crops, we have the quality and its use, *i.e.* the way to cook it. Banana gives an idea of the different criteria: quality mainly depends on the size of the bunch and the size of the fingers. The taste is also an important criterion: the *malindi* variety goes best with fat meat rather than the *mshale* that goes best with the offal (intestine, stomach); the *bukoba* is soft and less tasty whereas the *mshale* is stiff but tastier.

For food crop marketing chains, the majority of the measurements use the volume rather than the weight, at all stages of the chains. This represents an essential imperfection of the market and it opens the door for many kinds of fraud. In addition, it complicates research. Measurement units are bunches, heaps, buckets, baskets, bags, land-rovers, and lorries (7.5, 15 and 30 tonnes of loadings). The use of weight machine is very uncommon and none has been observed apart from the one provided by some street vendors (commonly called *machinga*³²) who check the weight of people for a few coins. Both in Mount Elgon and in Uporoto mountains, the bags are commonly used for important volumes and a full bag is supposed to weigh about 100 kg to 150 kg, depending of what is inside. There exists two sizes of bags, there are characterised by the number of buckets they can contain, there are either the *debe sita* (in principle about 110 kg) or the *debe nane* (in principle about 145 kg)³³. The bags are usually overfilled through a process that consists in increasing the size of the bag using another piece of a bag sewn on the top; this is called *lumbesa* in Tanzania.

Fig. 9. Avocado trader and lumbesa bags in Tandare (left) and potatoes traders in Ntokela (right), (Rcaud, 2010)

³⁰ Source: Mbeya Regional office of Cooperative. 31319 members = 12168 in Mbeya City, 9536 in Mbeya Rural, 9615 in Rungwe district.

³¹ 69,5 millions of Tsh = 33 000 EUR = 42 000 USD ; 100 millions of Tsh = 47 000 EUR = 61 000 USD

³² This term derive from “marching guys”.

³³ *Debe* means « bucket », it contains about 18kgs to 20kgs. *Debe sita* means 6 buckets, *debe nane* means 8 buckets.



As seen on the plate, the content juts out above the top of the bucket in a pyramid form, it is a common technique used for packaging potatoes and avocados. Moreover, some crooked traders cheat their customers using buckets with a double bottom, reducing the capacity of the bucket. There are different levels of standardisation in packaging, more or less elaborate. Governmental authorities try to curb this phenomenon by pasting official posters forbidding *lumbesa* but it is still largely practiced. The lack of standardisation does not favour transparency of the exchanges and reinforces dominant positions in the chains.

The commercial food crop marketing system is characterised by many intertwining of chains. The positions of the numerous actors vary according to market's opportunities and to the capital available while prices fluctuate. The forms of access to the market present some defective features which points out the inconsistency of economic integration.

CONCLUSION: THE ECONOMIC AND TERRITORIAL FRAGILITY OF INTEGRATION

The integration of the two peripheral mountains to their respective national territory and to the market partly rests on a model of integration based on commercial food crop marketing chains characterised by uncertainties, irregularities and informality. This model is controlled by the private sector and presents a structural dependence to the external urban demand; the forces of this system look for economic interests rather than the territorial development. As a result the driver of this model is also its weakness in such economic environment for which the public regulation has a poor effect. This flexible organisation is the anchor system of rural areas to some urban dynamics like the town food supply and it can be considered as a default choice.

The environmental and social environments of Mount Elgon and of the Uporoto Mountains give them comparative advantages for the towns food supply. The farming systems of those production basins adjust to the liberalisation of the market environment initiated since the 1980's. Shifts in agriculture are the expression of the insertion of market economy in rural life. This latter led to the specialisations of some production zones. The adjustments to the markets make the exchange system increasingly complex, *i.e.* there is a wide range of actors and places dealing with the commercial food crop marketing chains.

Several types of more or less structured markets coexist in the network of markets which are developing. Moreover, some market places specialize in some particular produce, for example bananas. The market places are hot spots of exchanges, in addition there are quite interesting for research that focus on trade of agricultural products. Nevertheless, market places are not the only exchanges spots, a significant part of transactions is done out, *i.e.* in the villages, at the farm gates or at some strategic places like some road junctions. The densification and the specialisation of market networks are indicators to the integration of the mountainous society to the market and links peripheral mountains to the national territory. However, the flow of agricultural products and actors of the chains are limited by the transport infrastructures which represents an important obstacle to exchange, especially during the rainy season.

Fluctuations, informality and flexibility characterise the commercial food crop marketing system and point out inherent uncertainties. Middlemen play a key role for connecting the producers to the market and for facilitating exchange between the rural and urban areas. Prices are very unstable, they change according to time (principally the season) and to the space (location of the transaction place), and moreover, price determination is blur. Measurement units depend on the volume rather than the weight, blurring the hypothetic transparent market. In addition the weak standardisation also concerns the produce themselves. Furthermore, there is inconsistency with access to information, particularly concerning the price awareness. These imbalances reflect in negotiation processes for which traders are the prices makers. The transactions are mainly informal and they rest on the trust plus or minus constraint, changing according to the panel of opportunities. The lack of accessibility to the market, to information, the deficiency of standardisation and the dissymmetry of power relations are features of an imperfect market.

The defectiveness of the commercial food crops marketing chains are grasped with regards to the integration of the mountainous society to the market and to the national territory. Integration is a dynamic that establishes closer relations between parts of a whole, it supposes the cohesion of the different elements. Exchanges develop, linking more and more actors, more and more places; this system organises some interdependences among the urban areas and the rural areas. Nevertheless, it appears that the cohesion is weak and strongly dependent on the market economy which is based on competitive logics and not on territorial integration logics. The objective of the market is not the territorial development. The domination of the private sector is flagrant and it addresses the weakness of such model of integration. It is obvious that the rural economy is more and more inserted to the market, and more and more dependant to external logics like the urban demand which is structuring for rural areas and moreover for the one well connected to exchange networks. Mount Elgon and the Uporoto Mountains currently face integration processes which are mainly expressed through shifts in agriculture and the densification of market places. Nevertheless, those two production basins appear to be more dependent to external logics (urban demand, foreign demand, international agricultural policies, world commodity prices fluctuation, etc.) and in the same time their dependences rest on their comparative advantages, *i.e.* their internal structural environment. The structural uncertainties of mountain agriculture (particularly the strong dependence of the climate) and the market forces (notably the high instability of prices, the high fluctuation of the relations offer/demand) do not give guarantee in terms of durability of such mountainous economic model. The more crucial weakness lies in the exogenous control of flows. Nevertheless, in that political and economic environment, the economic orientation of Mount Elgon and of the Uporoto Mountain seems to be a default choice, in the absence of other alternatives.

Instead to conclude with the classic litany of recommendations as “better organisation of the market” (information, infrastructure, coordination), “development of the quality”, “better organisation of the chains”, etc. it appears more challenging to confess the unpleasantness of the adopted position in this chapter and especially the characteristic of the universality of the integration to the market. The aim of this contribution is to point out some interactions between the model based on the commercial food crops with regards to its territory. To this end, although this paper does not focus on the economic efficiency of agricultural marketing chains, the approach is partly inspired by the agricultural marketing approach and it is based on the idea that market forces are the main driver of agricultural production and of the relations in societies where the agricultural activities are the principal source of income. This position would ensure the primacy of the economy above everything else. It would express the hegemony of the economic laws in the explication of social relations (Rist, 2010). Moreover, it would promote the axiom that access to the market would be the panacea for development. Integration to the market is one of the drivers of social change in East African Mountains, but it is worth repeating that other means, as the consolidation of citizenship are brought into play, and certainly on more sustainable foundations.

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