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Institutional determinants of rural youth transitions: insights from a long-term analysis in Senegal and Zambia

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Abstract: *In sub-Saharan African countries, the on-going demo-economic transition results in an unprecedented population growth in the world history. Given the importance of rural population and agricultural activities in SSA countries, this situation especially calls into question rural youth transitions. This paper seeks to identify main institutional determinants theses transitions. For this purpose, the paper combines a theoretical framework in institutional economics and a historical and comparative methodology. The research is based on the collection of original data in four rural areas of Senegal and Zambia that make it possible to build the modalities of transitions of successive generations of rural youth. By mobilizing a such long-term analysis, the paper identifies the main institutional determinants that explain youth transitions and demonstrates that these determinants differ according to agricultural and socio-economic contexts and gender.*

Keywords: *Institutional Economics, Youth, Rural, Africa*

JEL Codes: *B52, J11, O18, O55*

Introduction

In sub-Saharan Africa (SSA), the working-age population will grow by more than 450 million people by 2040 (UN-DESA, 2019), and most of this population will continue to depend on rural areas for income generation (Losch, 2016; Yeboah and Jayne, 2018). This massive influx of rural youth questions the capacity of current production structures to ensure the material and social conditions for young people in a rural environment under increasing demographic and environmental pressure.

In the literature, the diversity of rural livelihoods patterns is now well known. But researches that analyse the activity and mobility of rural youth are more scare. First of all, youth is often associated with individual characteristics that tend to forge an essentialist representation and to isolate young people from the social structures within which they operate (Ripoll *et al.*, 2017; Sumberg et Hunt, 2019). Secondly, activities related to youth transition are often considered in a cross-cutting way[1], which does not make it possible to follow individuals through their complete transition period (Yeboah *et al.*, 2020). Thirdly, the few studies that focus on rural youth transition do not necessarily analyse it according to the institutional context in which the young people operate (Chort *et al.*, 2014 ; Mwaura, 2017). When it the case (Locke and Lintelo, 2012; Sumberg and Okali, 2013; Berckmoes and White, 2014), the transition process is focused on the situation of today's youth cohorts. Since the long time span is neglected, these researches are not able to inform in a satisfying way key institutional determinants of rural youth transitions.

Therefore, the objective of this article is to highlight the determinants of rural youth transitions in some rural areas in SSA. The demonstration is based on theoretical and methodological originalities. The theoretical one is developed in the first section of the article. It consists in adopting an institutional

[1] We refer to Labour Force Surveys (LFS) implemented by the ILO and Living Standard Measurement Surveys (LSMS) from the World Bank.

approach to analyse youth transitions. The methodological one is detailed in the second section. It explains how we use successive cohorts, covering about 90 years, to build a long-term analysis of youth transitions. We collected longitudinal data in four rural areas of Zambia and Senegal and focused on data on activities and mobilities of youth during their transition.
Based on the elaboration of a typology of youth transitions, the third section highlight generational changes in youth transitions. By linking these generational changes with institutional changes, section 4 identifies institutional determinants of youth transitions in relation to different agricultural and socio-economic contexts in rural Africa.

Analysing rural youth transitions through institutions

Rural youth transition and economic activity in rural Africa

In SSA, the overwhelming majority of rural households are still heavily engaged in agriculture. The agricultural sector including upstream and downstream activities is likely to be the sector that can provide the most activities for rural youth in the coming decades.(Losch, 2016; Allen *et al.*, 2018; Jayne *et al.*, 2018; Kafle *et al.*, 2018). In most rural areas, agricultural and livestock activities are still the backbone of household socio-economic reproduction. Nevertheless, numerous studies demonstrate the importance of rural non-farm incomes and the growing dissociation of land, capital and labour, which are the basic means of household production (Bryceson, 1999; Ellis, 2000; Haggblade *et al.*, 2007; Bernstein, 2010; Losch *et al.*, 2012; Davis *et al.*, 2017; Djurfeldt *et al.*, 2018). The literature also indicates that this process of diversification sometimes goes along with multi-location of households' activities when the migration of household members to cities or other rural areas contributes to maintain the rest of the family in their village (Boyer et Mounkaila, 2010; Cross et Cliffe, 2017; Mercandalli et Losch, 2017; Steel *et al.*, 2019).
Hence, rural households organize their economic activity and generate income across different sites of the social division of labour - urban and rural, agricultural and non-agricultural, wage employment and self-employment - to ensure their socio-economic reproduction. This long-term dynamic calls into question youth transition in rural areas: in what type of income generating activities do young men and young women engage for getting their economic independence? What are the determinants institutions governing access these activities?

Youth transitions and institutions

Youth is a period of transition where individuals gradually emerge from a situation of economic dependence to access a relative typical adulthood autonomy (Antoine *et al.*, 2001). During this phase, young people act, depending on their economic, social and cultural capital, in a set of institutions that constitute both a framework of constraints and incentives for individual action but which can also take on a collective dimension (Vercueil, 2013).
This article suggests that a combination of five key institutional components governs the modalities of rural youth transition. The first three concerns institutions that determine how young people access to land, capital and knowledge. Indeed, given the historical dominance of family farming among economic activities in rural areas, institutions related to land and capital access are a major factor in the organisation of the production process. Moreover, given the increasing enrolment in formal education and engagement (Barro and Lee, 2013) in labour markets and migration (Mercandalli *et al.*, 2019), access to knowledge and know-how may be an essential component of youth transitions. The fourth component involves institutions governing the sharing of value resulting from the activity generating by

young people: it includes family institutions as well as labour market or agricultural market institutions. The last institutional component of youth transition relates to the social protection[2] related to the commitment of youth in income-generating activities.

Hence, the objective of the paper is to identify and prioritise the main institutions governing rural youth transitions. The central hypothesis of this paper is that institutional determinants of rural youth transition depend on the context and the gender and they change over time. To test this assumption, this paper analyses youth transitions of successive cohorts of young men and women in four rural areas in Senegal and Zambia.

Building a long-term approach by manipulating rural youth cohorts

A comparative approach between rural areas discriminating by their agricultural potential

The comparative approach aims to identify differences and similarities in the modalities of rural youth transitions depending on the type of rural area. Based on existing databases and surveys with local stakeholders, we selected rural areas in Senegal and Zambia[3] according to the importance of farming activities. Study areas are located in the communes of Ronkh and Wake Ngouna in Senegal, and the districts of Mpongwe and Choma in Zambia (see Appendix 1 for the details on study areas).

The reconstitution of youth transitions on the long-term

For building the evolution of youth transitions over the long-term, we analyse the transition of a succession of cohorts of men and women in all study areas. Indeed, the unit of time of each cohort taken separately is too short for identifying key institutions that determine youth transition on the long-term. Therefore, the succession of cohorts makes it possible to reconstruct a long period of time and to identify the main determinants of youth transitions.

For informing the transition, we implemented biographical surveys in order to collect data about activities and mobilities of men and women between 15 and 35 years old. The aim of the biographical questionnaire is to interview individuals to retrace the different sequences of their economic, residential and family life (Courgeau, 2009).

By implementing biographical surveys with 525 households in four areas between June 2017 and May 2018, we collected 471 rural men transitions and 499 rural women transitions. In each administrative area, the commune in Senegal and the district in Zambia, a limited number of villages were surveyed. They were selected according to the representativeness of their socio-economic dynamics compared to those of the commune or district. Among these villages surveyed, the sampling rate was about 10% in order to have a representativeness of all the villages surveyed. The choice of households surveyed is based on a stratified random sampling in order to respect the sampling frame for each village. In each selected household, the head of the household and his wife (or one of his wives if the husband is polygamous[4]) was surveyed. In case of single woman headed household (rare in Senegal but frequent in Zambia: 16% in Choma district and 20% in Mpongwe district), only the woman was interviewed.

[2] Social protection of workers provide indirect redistribution of value through collective mechanisms that mitigate individual risks. These risks include situations that could compromise the economic security of individuals or their families, causing a decrease in resources or an increase in expenses: old age, illness, disability, unemployment, work injury or pregnancy.
[3] The choice of countries, Senegal and Zambia, is related to the funding of this doctoral research.
[4] The choice of the woman to be surveyed was left to the husband, which constitutes an individual selection bias (most often the first woman was chosen). However, we preferred to have this type of bias rather than to face a potential tension from the head of the household by imposing the choice of the woman to be surveyed, which would then constitute a much greater bias, or even affect the whole survey.

Building of a typology of youth transitions

Based on the biographical data collected, we elaborated two type of transitions for each people surveyed: a transition as a succession of “activity state” and a transition a succession a “mobility state”. (see Appendix 2 and Appendix 3 as well as Appendix 4 for an example of young men transitions in Wake Ngouna area – Senegal).

Then, we implemented a sequence analysis, more precisely an Optimal Matching Analysis (OMA), for elaborating a typology of activity transitions and mobility transitions in each study area by differentiating men and women. More exactly, we used the Dynamic Hamming Distance (Lesnard, 2010) and we implemented the OMA with Stata and the SADI plugin (Halpin, 2017).

A qualitative analysis of institutions

We completed our quantitative approach with a more qualitative analysis of institutions related to the different types of youth transitions identified. First, in supervising the implementation of biographical surveys, we participated in approximately one-third of the interviews. Then, in each area, we conducted interviews with customary and municipal authorities, extension services, farmers' organizations and managers of large-scale farms.

Generational changes in rural youth transitions

The aim of this section is to relate the diversity of successive cohorts of rural men and women transitions in study areas.

A relative diversity of rural youth transitions depending on the area and on gender

From the sequence analysis process, we identified six types of activity transitions and five types of mobility transitions. These types are differently present according to the study area and gender (see Figure 1 and Appendix 5). Regarding activity transitions, we identified six types:

- *The type "Family worker transition*" includes young people who did not have access to their own income between the ages of 15 and 35 and continued to depend on their families for their livelihood.
- *The type "Farming transition"* includes young people who started their own farming activity (which includes cropping and livestock activities) and who exclusively maintained this activity until the age of 35.
- The type “*Non-farm pluriactivity transition*" includes young people who combined their own farming activity with a non-farm activity (either as a self-employed or wage worker).
- The type “*Farming pluriactivity transition*" includes young people who combined their own farm and another activity related to the agricultural sector (either as a self-employed or wage worker)
- The type “*Non-farm transition*” includes young people who engaged a non-farm activity, either as self-employed or wage worker;
- The type "*Long schooling transition*" includes young people who, between the ages of 15 and 35, have been mainly at school.

Regarding mobility transitions, we identified:

- The type "*Rural transition"* includes young people who mainly remained living in the district or department in which they were born without being involved in particular forms of migration between 15 and 35 years old;
- The type *"Rural-urban circular transition"* includes young people who migrated to urban areas on a seasonal basis (within or outside their district or department of residence) during several years between 15 and 35 years old;
- The type *"Urban to rural transition"* includes young people who migrated "permanently" from an urban area to a rural area (within or outside their district or department of residence) between 15 and 35 years old;
- The type *"Rural to urban transition"* includes young people who migrated "permanently" from a rural to an urban area (within or outside their district or department of residence) between 15 and 35 years old;
- The type *"Rural to rural transition"* includes young people who migrated "permanently" from one rural area to another rural area (outside their rural district or department of residence) between 15 and 35 years old.

We used the types of mobility transition for characterizing each type of activity transitions (see Table 2 and Table 3).

Regardless of the cohort and the agricultural potential of the study area, the diversity of type of transition is lower for women than for men (see Figure 1). Indeed, between 80 and 90% of women access to income only through farming activity during their transition whereas 10% of them access to incomes through pluriactivity by combining farming with services related activity in their village. The same dynamic can be observe for mobility transition: women mainly move within their district or department from a village to another village during their transition (especially when they get married and they join their husband in a neighbouring village). On the contrary, both activity and mobility men transitions are more diverse and we will try to explain this difference in relation with institutional context in section 4.
At the same time, in terms of mobility patterns, *"rural transitions"* prevail for all types of activity transitions for men as well as for women (see Table 1 and Table 2). This fact reflects that rural areas are more and more places for a diversification of economic activity. It also appears that rural-urban circular migration is always related pluriactivity transitions for men.
The diversity of men transitions depends on territorial resources that are various depending on study areas. For instance, in high agricultural potential areas, the importance of *"farming pluriactivity transitions"* is firstly related to seasonal employment opportunities in large-scale farms for young people in addition to their own farming activity. In Zambia, *"non-farm pluriactivity transitions"* often combine farming and charcoal production. In studied Senegalese areas, forestry resources are quite scare and many young men are involved in services activities in their village or in more or less big cities (see Table 1 the high proportion of circular migration in Wake Ngouna area for instance).

	Farming				Family work		Non-farm pluriactivity				Farming pluriactivity			Non-farm		Long schooling	
	Mpongwe	Ronkh	Choma	Wake	Ronkh	Wake	Mpongwe	Ronkh	Choma	Wake	Mpongwe	Ronkh	Choma	Mpongwe	Wake	Ronkh	Choma
Mobility transition																	
Rural	41	100*	88*	61	94	79*	57*	82	92*	38*	63*	93	17*	10*	25*	64*	67
Rural to urban	5*	0*	0	2*	6	7	7*	18	0	10	5*	7	0	59*	25*	36*	0
Urban to rural	30*	0	0	0	0	0	7*	0	0	0	16	0	0	24	0	0	0
Rural to rural	24	0	0	0	0	0	29	0	0	0	16	0	0	7*	0	0	0
Circular rural-urban	0	0	12*	37	0	14*	0	0	8*	52*	0	0	83*	0	50	0	33

Table 1. Mobility dynamics of activity transitions of young men in the four study areas (% of mobility transition contributing to activity transition). *N.B : * indicates cases where the contribution of the mobility transition is significant for the type of activity transition compared to others types of activity transitions (Proportion test between transition i and others transitions * if p-value<0.05). Source: surveys*

Mobility transitions	Farming				Family work				Non-farm pluriactivity				Farming Pluriactivity	
	Mpongwe	Ronkh	Choma	Wake	Mpongwe	Ronkh	Choma	Wake	Mpongwe	Ronkh	Choma	Wake	Ronkh	
Rural	61*	97	99*	93*	33*	93	72*	87	43	82	93	62*	100*	
Rural to urban	0*	3	NA		52*	7	NA		0	18	NA	0*	0*	
Rural to rural	NA	NA	1*	7*	NA		28*	13	NA	NA	7	38*	NA	
Urban to rural	39	NA	NA		15*	NA	NA		57*	NA	NA	NA	NA	

Table 2. Mobility dynamics of activity transitionsof young women in the four study areas (% of mobility transition contributing to activity transition). N.B : * indicates cases where the contribution of the mobility transition is significant for the type of activity transition compared to others types of activity transitions (Proportion test between transition i and others transitions * if p-value<0.05). Source: surveys

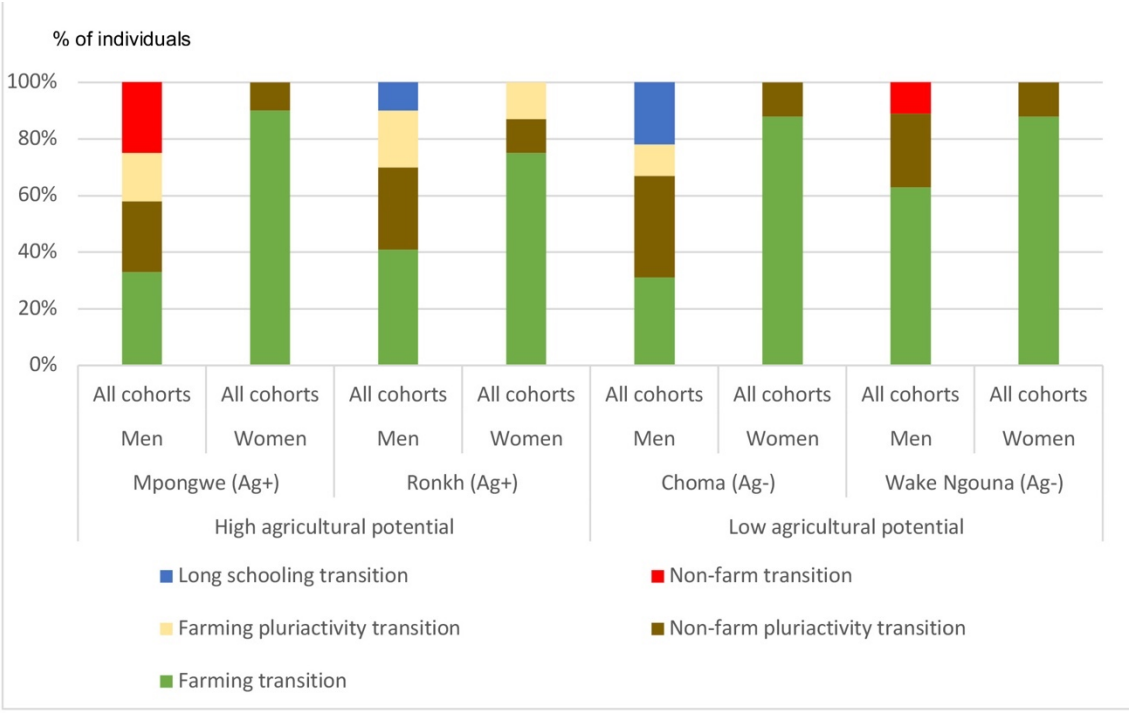

Figure 1. Activity transitions in four study areas for men and women.

Generational differences in rural youth transitions

The analysis of the activity and mobility transitions of a succession of cohorts of young rural people over several decades highlights generational differences in the modalities of transitions of young men and women. To achieve this analysis, we created three cohorts in each area for both men and women and we compared the evolution of each type of activity transitions between cohorts (see Table 3 and Table 4). First of all, in every areas, the youngest men cohorts show a significant drop in *"farming transitions"*. In high farming potential areas, this decline follows a revival of *"farming transitions"* for the 1965-1980 cohorts. However, in low agricultural potential areas, this decline seems to go along the shift, already long-standing, towards new types of transitions. "*Farming pluriactivity transition*" is replacing *"farming transition"* only in Mpgonwe district (Zambia). In others areas, "*Non-farm pluriactivity transition*" is the preferred transition option for youngest cohorts.

Regarding women, we observe a slightly decrease in the *"family worker transition"* in nearly all areas and an increase in *"farming transition"* between generations. Moreover, women transitions are marked by less mobility than men in study areas. Although several scholars demonstrate a relative recent increase of women engagement in labour markets (Delaunay *et al.*, 2016; Lesclingand and Hertrich, 2017; Van den Broeck and Maertens, 2017), we do not observe a significant increase in *"non-farm pluriactivity transition"* as it is the case for young men. This can be explained by our methodology which focuses on the long-term and does not includes the most recent cohorts of young women.

Type of transition	Cohorts born before 1965		Cohorts born between 1965 and 1980		Cohorts born after 1980	
	freq.	%	freq	%	freq	%
Mpongwe (Zambia)						
Farming	16	32	17	53**(+)	4	13**(-)
Farming pluriactivity transition	2	4	4	13	13	39**(+)
Non-farm pluriactivity transition	8	16	8	25*(+)	12	42
Non-farm	24	48	3	9**(-)	2 %	6
Ronkh (Sénégal)						
Farming	5	10	13	25**(+)	4	11*(-)
Family worker	13	25	18	35	4	11**(-)
Farming pluriactivity transition	14	27	3	6**(-)	11	31**(+)
Non-farm pluriactivity transition	18	35	12	23*(-)	10	29
Long schooling	2	4	6	11*(+)	6	17
Choma (Zambia)						
Farming	15	44	13	36	6	15**(-)
Farming pluriactivity transition	5	15	7	19	0	0**(-)
Non-farm pluriactivity transition	6	18	9	25	24	62**(+)
Long schooling	8	23	7	19	9	23
Wake ngouna (Senegal)						
Farming	23	48	16	40	2	9** (-)
Familiy worker	12	25	13	32.5	3	14* (-)
Non-farm pluriactivity transition	6	12	8	20	15	68** (+)
Non-farm	7	15	3	7.5	2	9

Table 3. Proportion comparison tests between cohorts and activity transition of young men[5] (* if p-value is between 0.1 et 0.05 and ** if p-value is below 0.05). *Source: surveys.*

[5] N.B: The test shows whether the percentage of individuals in a cohort belonging to a transition type is significantly different from that of the previous cohort. The signs (+) and (-) indicate in which direction is the difference compared to the previous cohort.

Type of transition	Cohorts born before 1965		Cohorts born between 1965 and 1980		Cohorts born after 1980	
	freq.	%	freq	%	freq.	freq.
Mpongwe (Zambia)						
Farming	22	50	20	55	45	83*(+)
Family worker	19	43	10	28*(-)	4	7*(-)
Non-farm pluriactivity	3	7	6	17*(+)	5	10
Ronkh (Sénégal)						
Farming	8	33	20	45	45	65**(+)
Family worker	5	21	10	22	15	22
Farming pluriactivity	5	21	11	24	2	3**(-)
Non-farm pluriactivity	6	25	4	9*(-)	7	10
Choma (Zambia)						
Farming	17	52	17	52	47	85**(-)
Family worker	12	36	8	24	5	9**(-)
Non-farm pluriactivity	4	12	8	24	3	6**(-)
Wake ngouna (Senegal)						
Farming	5	50	22	60	35	59
Family worker	5	50	9	24	17	29
Non-farm pluriactivity	0	0	6	16	7	12

Table 4. Cohorts and activity transitions for young women. *Source: surveys.*

These main results point to a reconfiguration of youth transitions around agriculture. In order to explain institutional changes for characterizing this reconfiguration, we analyse changes in activity and mobility transitions through an institutional analysis on the long-term.

An institutional analysis of changes in rural youth transitions

The aim of section 4 is to identify institutional changes (see Table 5 for a summary of these changes). That explain generational changes in youth transitions highlighted in section 3.

Access to productive capital: an increase involvement of young men in labour markets in all areas

In Ronkh (Senegal) and Mpongwe (Zambia), the two areas with high farming potential, intergenerational differences in accessing productive capital are explained by the increased capital intensity of farming systems and the settlement of large-scale farms providing agricultural wage employment. This historical dynamic has produced gradual institutional changes to the extent that for younger cohorts, new rules for accessing capital are adding to the existing ones based on family transmission of capital. Sometimes, those new rules tend to overshadow historical ones. The situation is illustrated by the significant drop in the number of young men with *"farming transition"* from 53% to 13% in Mpongwe area and from 25% to 11% in Ronkh area for the two latest cohorts which is balanced by an increase in *"farming pluriactivity transition"* from 13% to 39% and 6% to 31%.

In both areas with limited agricultural potential (Wake Ngouna in Senegal and Choma in Zambia), the modalities of access to capital for the oldest cohorts have been called into question by an agricultural production crisis is due to a combination of ecological and economic crisis (decrease in soil fertility, increase in climatic hazards, increase in market instability). In these areas, this crisis has resulted in the gradual failure of the family to continue to ensure the transmission of capital to the younger generations. Young people had to find other way for accessing productive capital. The significant drop in the number of young men with "*farming transition"* from 48% to 40% and then to 9% in Wake Nougna area and from 44% to 36% to 15% in Choma area illustrates this change in accessing capital. This sharply declining proportion is balanced by a structural increase in *"non-farm pluriactivity transitions",* which rose from 12 per cent to 20% and then 68% of young men in cohorts in Wake Ngouna area and from 18% to 25% and then to 62% in Choma area (see Table 3).

In Wake Ngouna area, migration networks then play the role of social and economic capital in place of the family. However, in Choma area, the rules of access to capital were closely related to the marriage institution since cattle were generally the dowry and a working equipment for starting farming. Thus, for the younger generations in Choma, it is rather forms of individualisation of access to capital around activities with low entry costs such as the exploitation of local natural resources (charcoal in particular) and informal daily agricultural wage labour that ensure access to capital for individuals born from the 1980s onwards.

Regarding women, we observe an institutional continuity in access to capital as it remains structurally determined by male domination. Indeed, women continue to be mainly involved in the family farm when they get married and they do not migrate during their youth (see Table 2 and Table 4). This situation does not say that women do not find other ways to access capital (through women organisations, specific NGO programs, etc.) but it did not stand out in a significant manner in our surveys.

Access to land: between the strengthening of customary institutions and the commodification of land rights

The evolution of land institutions is mainly differentiated according to the country. In Senegal, we observe a strong individualization through the commodification of land rights. These changes contribute to maintain *"farming transitions"* for the youngest cohorts in Ronkh. However in Wake Ngouna, the increase in *"non-farm pluriactivity transitions"* contribute to explain the evolution of access to land as young people use their income from non-farm activity to rent, even buy, land.

In Zambia, youth transitions of oldest and youngest cohorts take place in a context where the land institutions has not change so much, compared to Senegal. In both Zambian areas, the traditional

chiefdoms manage land over a relatively large area, but the transmission of land to the family level follows a matrilineal lineage (*e.g.* the household starting its own farm has access to the land through the woman's family). The common principle grants usufruct land rights to local residents and ban the alienation of land.
However, in the framework of a broad transition to a liberalized economy from the early 1990s, the Zambian State enacted the 1995 Land Act which provides for procedures for the securitization of customary land for individuals and enterprises (Sitko and Chamberlin, 2016). Despite this Act, all cohorts of youth in Choma area accessed to land through family or allocation by a traditional chief, which can be interpreted as a process of institutional continuity. The situation is more complex in Mpongwe District. The majority of land remains under the authority of customary chiefs, but land pressure is increasing due to the settlement of large-scale farms and the settlement of urban dwellers from the 1990s onwards. This pressure leads to tensions over land tenure, which contribute to the beginnings of the commodification of land rights, which is mainly the subject of negotiations between customary chiefs and outside investors or urban dwellers who come to settle. Thus, it seems that this process does not yet directly affect local rural youth, as some land reserves still exist. Institutional change seems to come more from the political authority in charge of respecting the institution than from the individuals who are subject to it.
In every area, women cultivate with their husband but they can also access to their own land for cultivating and selling their own product. Most of the time, they access to land through their husband or through women organisations.

Value distribution: increasing instability in agricultural markets

During the 1980s and 1990s, the process of agricultural liberalization occurred in Senegal and Zambia represent exogenous factors that generated abrupt institutional changes: while the oldest cohorts of young people were dependent on state monopolies, the youngest cohorts are dependent of occasional and unpredictable state interventions. The privatization of value chains and unpredictable state interventions result in an agricultural prices instability and thus farmers face an increasing uncertainty for the valorization of their products. This dynamic contribute to explain the *"non-farm pluriactivity transitions"* for managing the risks related to instability.

Indirect value distribution: a limited increase in non-family forms of social protection

In Ronkh, Mpongwe and Wake Ngouna areas, formal local agricultural wage employment or migration constitute means of outsourcing collective welfare mechanisms, historically provided by the family. These new and not exclusively family-based rules for the protection of individuals produce a form of institutional change because they do not necessarily call into question the indirect redistribution of the value produced by the family to constitute collective welfare mechanisms, but they are added to them.
Indeed, in the Mpongwe and Ronkh areas, the formal wage system is a way, more or less stable over time, of externalizing some of the risks associated with situations likely to jeopardize the economic security of the individual or his family, particularly in relation to health-related risks. In case of formal employment, large-scale farms often partly cover health expenditures for the worker, and sometimes its family. In study areas, mostly young men are engaged in this type of formal agricultural wage employment. It is mainly due to the type of activity: sugar cane cutting or machine operation that are activities mainly carried out by men. But in other rural areas, women are greatly involved in formal

agricultural wage employment, especially regarding plantation or gardening harvests (Van den Broeck and Maertens, 2017).
In Wake Ngouna area (Senegal), circular and seasonal migration resulted in institutional change in the way families take care of their members. This change has taken place gradually, from cohort to cohort, with the building of migration networks that now constitutes a way of externalizing a part of protection against life risks for the most recent cohorts of young people. Young men are thus no longer dependent on the family a part of the year, since some dimensions of migrant protection are socialised.

Knowledge: the constraints of technical agricultural models

Depending on study areas, the introduction of exogenous technical agricultural models has generated intergenerational differences in the modalities of family transmission of agricultural knowledge.
In Ronkh and Mpongwe areas, the family still plays a certain role in the transmission of agricultural knowledge as individuals are socialized to agricultural labour from an early age. But access to agricultural knowledge for the most recent cohorts of young people is now also based on a network of agricultural extension services and large-scale farms. This dynamic can be interpreted as a phenomenon of institutional change. Indeed, although this new way of accessing knowledge is favoured by the youngest cohorts, the family transmission of knowledge is not ruled out.

<table>
<tr><th colspan="2"></th><th colspan="5">Key institutions of rural youth transition</th></tr>
<tr><th>Area</th><th>Agricultural potential</th><th>Access to capital</th><th>Value distribution</th><th>Access to land</th><th>Access to knoweldge</th><th>Social protection</th></tr>
<tr><td>Mpongwe (Zambia)</td><td>High</td><td rowspan="4">Increasing youth involvment in labour markets</td><td rowspan="4">Increasing instability in agricultural markets</td><td rowspan="2">Increasing informal leasing of land rights</td><td rowspan="2">Increasing role of large-scale farms</td><td rowspan="2">Family and formal wage employment in large-scale farms</td></tr>
<tr><td>Ronkh (Senegal)</td><td>Low</td></tr>
<tr><td>Wake Ngouna (Senegal)</td><td>High</td><td rowspan="2">Lock-in of the technical model</td><td>Family and migration networks</td></tr>
<tr><td>Choma (Zambia)</td><td>Low</td><td>No change: a strenthening of family institutions</td><td>Family</td></tr>
</table>

Table 5. Main institutions change explain rural youth transitions in the four study areas. *Source: author.*

In Wake Ngouna and Choma areas, there is rather an institutional reproduction in the sense that family transmission of knowledge predominates in connection with a lock-in effect of the technical system. The improvement of groundnut and maize productivity has been the subject of particular attention since colonisation, and then by the Senegalese and Zambian state and their extension services, which trained and provided farmers with equipment: ploughing with draught animals, mineral fertilisers, and abandonment of associated crops. These production techniques contributed to increase production and incomes for a few years but also contributed to the soil depletion that the following cohorts had to face;

in addition, the climatic hazards increased. The restoration of agricultural productive capacity by the youngest cohorts seems to be hampered by the technical model, since the economic risks taken to introduce new practices may be high.

Conclusion

The article produces a long-term based analysis of institutional change that results in the prioritisation of institutions that explain rural youth transitions according to agricultural and socio-economic contexts (cf. Table 5).

Access to productive capital and value distribution are key determinants of youth transitions in all study areas. Transition is characterized by an increasing involvement of young men, and to a lesser extent of young women, in labour markets. When settling they own farming activity, they face an increasing instability of agricultural markets compared to previous generation. Nevertheless, in high agricultural potential areas, the development of contract farming in the recent years seems to somewhat limit market instability.

In most study areas, young men access to land more and more through informal land rights rent, even land rights purchase. In most cases, young women access to land through their husband or, to a lesser extent, through women collective organisations. Informal rent or purchase is an alternative on the short term for accessing land but in the long-term, this option is not viable as this type of access is not always recognized by the political authority governing land rights (such as customary authorities in the two study areas in Zambia or municipalities in Senegal). These institutional arrangements are quite insecure and they threaten farm settlement in the long-term. These situations require new political regulations for allowing young people to access land in a secure way.

Regarding access to knowledge, the capacity of young people to make evolve agricultural technical models seems determinant. But we observe a difference depending the agricultural potential of the study area. In high agricultural potential areas, young people can access and interact with many extensions services stakeholders (including large-scale farms), but the promoted model remains the conventional agricultural model (capital and input intensive). In low agricultural potential areas, changing the agricultural model is not easy due to quite high economic risks.

At last, family still largely dominates the indirect redistribution of value by the main institution taking care of risks associated with the involvement of young people in income generating activities. In some cases, we observed an evolution of social practices that produce institutional change by moving towards the socialisation of the protection of life's risks (through agricultural wage employment especially).

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Appendices

Appendix 1. Characteristics of study areas in Senegal and Zambia (Zambia: last census in 2010; Senegal: last census in 2013)

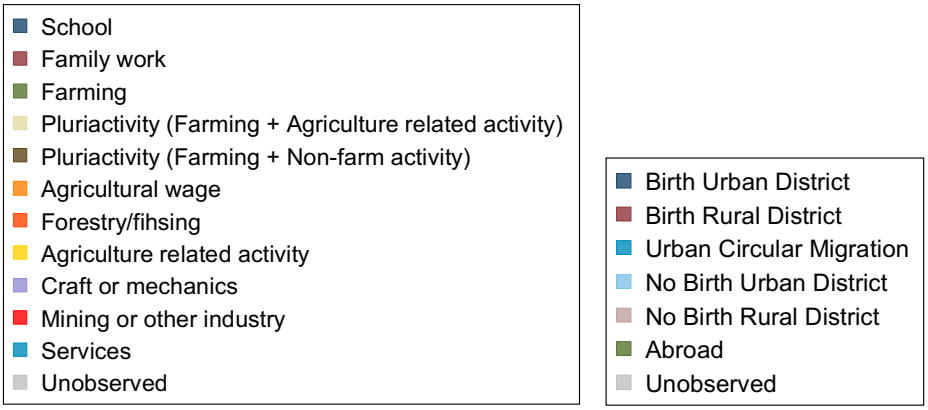
High agricultural potential		Low agricultural potential	
Mpongwe (Zambie)	**Ronkh (Sénégal)**	**Choma (Zambie)**	**Wage Ngouna (Sénégal)**
Population density at last census (study area level and national level)			
11 inhab/km^2 19 inhab/km^2	46 inhab/km^2 71,2 inhab/km^2	34 inhab/km^2 19 inhab/km^2	160 inhab/km^2 71 inhab/km^2
Average annual population growth rate between two censuses			
3,8 % (2000-2010)	3,4 % (2002 – 2013)	1,9 % (2000-2010)	n.d % (2002 – 2013) 2,5 % au niveau national
Rainfall			
1000 mm, low intra-annual variability	225 mm (irrigated agriculture from the Senegal River)	800 mm, high intra-annual variability	800 mm, high intra-annual variability
First nearest large city (distance - number of inhabitants)			
Luanshya (60 km – 120 000 inhab)	Richard Toll (30 km – 70 000 inhab)	Choma (30 km – 60 000 inhab)	Kaolack (50 km – 233 000 inhab)
Land			
Land availability and good agronomic quality of soils Processes of land commodification, which mainly concern large-scale land acquisitions	Construction of many irrigated areas over the past 50 years A process of land commodification that is becoming more widespread in relation to land value and large-scale land acquisitions.	Medium land availability No land commodification	No land availability Land commodification for renting
Dominant agricultural production systems of rural households			
Maize / groundnut / soybean Poultry/small ruminants/oxen	Irrigated rice and vegetables Poultry/small ruminants/oxen Pastoralism	Maize/groundnut/gardening Poultry/small ruminants/oxen	Millet/groundnut/sorghum/maize/beans/gardening Poultry/small ruminants/donkeys/horses
Evolution of the technical model and the determinants of agricultural productivity			
Transition from manual cultivation on slash-and-burn without inputs to harnessed/motorised cultivation with inputs No fertility crisis Recent market integration	Transition from agriculture-fisheries-pastoralism complementarity to irrigated rice-growing with high dependence on inputs Strong recent market integration process	Old harnessed cultivation Ancient yoke culture Average soil fertility crisis and decapitalization of livestock (diseases, diseases, etc.)) Old market integration process	Old harnessed cultivation High soil fertility crisis Old market integration process
Coexistence of different types of farms (family/family businesses/capitalist)			
Capitalists: Mpongwe Development Company puis Zambeef, 10 000 ha et 5000 wage workers Family businesses	Capitalists: Compagnie sucrière sénégalaise from the 1970s, 10 000 ha, 8000 wage workers Senhuile. Family businesses	No	Family businesses
Household Economic Diversification			
Forestry fishing, services, agricultural wage employment	Craft, services agricultural wage employment	Forestry , Craft	Craft, services
Migration dynamics			
In-migration area and few domestic circular migration	Old in-migration area and few domestic circular migration	Definition out-migration area and few domestic circular migration	Definition out-migration area and many domestic circular migration.

Appendix 2. Coding of activity states and mobility states

	Activity state	Type of activity	Definition of activity state
1	School	Single activity	The individual is at school (public or private)
2	Family work	Single activity	To be accounted for in this state, the individual is either : (i) A man exclusively engaged in family work *i.e.* he works under the authority of his parents or elder without any other paid activity; (ii) A woman exclusively engaged in family work *i.e.* she works under the authority of her parents or elder without any other paid activity. If the wife is a housewife in the city (where the husband has a paid activity), she is recorded in this state. On the other hand, if the wife contributes to her husband's activity (which is the case for agricultural activity from the time of the marriage), she is not recorded in this state. Family work can be an agricultural activity, household chores (for women) or any other activity. As soon as the individual has ano7ther paid activity, his or her condition is no longer considered as family work although he or she may continue to contribute to it and depend on his or her parents.
3	Own Farm	Single activity	The individual is the head of his or her own farm. This operation may consist of a plot of land that he farms before he has his own household. When he is in a household, the married woman is considered to contribute to the work on the farm and is therefore recorded in this state. Farming activity includes activities related to crop and livestock farming.
4	Pluriactivity: Own Farm and other agricultural related activity	Multi-occupational	In addition to his own farm, the individual either carries out another activity related to the agricultural sector (see state 7) or is an agricultural wage worker (see state 6)
5	Pluriactivity: Own Farm and non-farm activity	Multi-occupational	In addition to his own farm, the individual either carries out another non-farm activity (see states 7, 9, 10, 11)
6	Agricultural wage employment	Single activity	The individual is an agricultural wage worker on a permanent or temporary basis (but at least for a cropping season) Daily wage agricultural employment is excluded of this state
7	Forestry/Fishing	Single activity	The individual engages an activity related to the forestry (charcoal, harvesting of forest products) or fishing (river or sea).
8	Activity related to the agricultural sector	Single activity	The individual engaged an activity related to the agricultural sector such as food processing (milk or beverage processing), fattening or driving agricultural machinery. Commercial activities related to agriculture are taken into account in this state (sale of milk, trade in cereals, agricultural inputs or livestock).
9	Craft/Mechanics	Single activity	The individual carries out a crafting activity (brick-layering, carpentry, brick-making, etc.) or a mechanic activity.
10	Mines or other industry	Single activity	The individual is employed as a miner or works for the manufacturing sector.
11	Services	Single activity	The individual engages the following activities: trade other than products directly related to the agricultural sector (grocery store, small trade in manufactured goods, street vendor), transport (driver, driver's cab), health (nurse), sewing, hairdressing, security, catering, bakery, tourism, civil servant, teaching.
12	Unobserved	Non applicable	Corresponds to unobserved years for individuals under 35 years of age at the time of the survey.

	Definition of mobilty state
1	The individual lives in his/her born urban district/department
2	The individual lives in his/her born rural district/department
3	The individual lives in his/her born rural district/department and migrate in an urban area on a circular basis
4	The individual lives in his/her born rural district/department and migrate in another rural area on a circular basis
5	The individual lives in a urban district/department other than that of birth
6	The individual lives in a rural district/department other than that of birth
7	The individual lives in a foreign country
8	Unobserved

N.B : The district is a Zambian administrative unit which is closest to the department, a Senegalese administrative unit, in terms of surface area and population size.
The distinction between urban and rural areas gives rise to much debate. In our survey, we used urban category when the individual specified that he or she dwelled or carried out a seasonal activity in a "big city", *i.e.*, in a regional capital or the national capital. In surveys conducted in Senegal, urban areas most often correspond to the Dakar region, the city of Saint Louis, Richard Toll or Kaolack. In Zambia, the main urban areas are the mining towns in the Copperbelt region (Ndola, Luanshya, Kitwe, etc.), the country's capital Lusaka and some regional capitals (such as Choma or Livingstone in the Southern Province).
Below are the legends used in the figures. On the left, the one for activities and on the right, the one for places of residence.



Appendix 3. Distribution of activity and mobility states in all types of activity transitions[6]

Distribution of activity states in all types of activity transitions

	Men								Women							
Activity state	Mpongwe (ZM)		Ronkh (SN)		Choma (ZM)		Wage Ngouna (SN)		Mpongwe (ZM)		Ronkh (SN)		Choma (ZM)		Wage Ngouna (SN)	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
School	315	13%	201	7%	367	16%	51	2%	176	6%	67	2%	249	10%	16	1%
Family work	384	16%	999	34%	324	14%	850	37%	581	21%	709	24%	377	15%	545	24%
Own Farm	480	20%	603	21%	571	25%	530	23%	1351	48%	1067	37%	1217	48%	1085	49%
Pluriactivity: Own Farm and other agricultural related activity	127	5%	213	7%	139	6%	21	1%	81	3%	301	10%	27	1%	88	4%
Pluriactivity: Own Farm and non-farm activity	352	15%	209	7%	371	16%	397	17%	186	7%	209	7%	182	7%	155	7%
Agricultural wage employment	126	5%	207	7%	43	2%	15	1%	57	2%	25	1%	7	0%	0	0%
Forestry/Fishing	41	2%	24	1%	64	3%	5	0%	25	1%	16	1%	10	0%	0	0%
Activity related to the agricultural sector	23	1%	4	0%	69	3%	7	0%	0	0%	0	0%	0	0%	0	0%
Craft/Mechanics	130	5%	167	6%	37	2%	65	3%	0	0%	0	0%	0	0%	0	0%
Mines or other industry	69	3%	23	1%	13	1%	6	0%	0	0%	0	0%	0	0%	0	0%
Services	227	10%	149	5%	54	2%	314	14%	80	3%	111	4%	33	1%	32	1%
Unobserved	99	4%	120	4%	237	10%	49	2%	277	10%	393	14%	439	17%	305	14%
Total	2373		2919		2289		2310		2814		2898		2541		2226	

Source: surveys

[6] La distribution correspond à la sommation de l'ensemble des états d'activité et de résidence répertoriés par zone et par genre (le nombre total d'états est égal au nombre d'année de la période, soit 21, multipliée par le nombre d'individus dans la zone enquêtée)

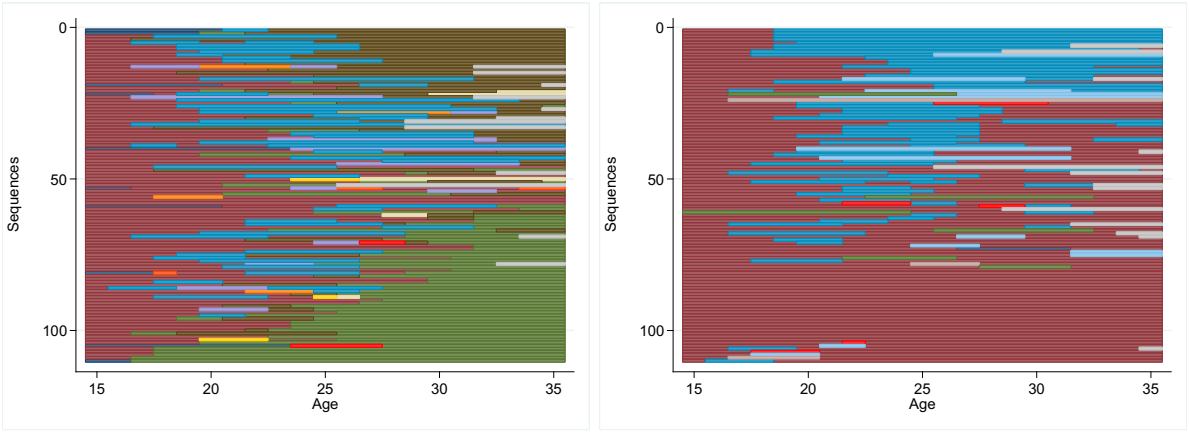
Distribution of mobility states in all types of activity transitions

Etats de résidence	Men								Women							
	Mpongwe (ZM)		Ronkh (SN)		Choma (ZM)		Wage Ngouna (SN)		Mpongwe (ZM)		Ronkh (SN)		Choma (ZM)		Wage Ngouna (SN)	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
The individual lives in his/her born urban district/department	318	13%	32	1%	21	1%	5	0%	428	15%	39	1%	19	1%	0	0%
The individual lives in his/her born rural district/department	1076	45%	2450	84%	1724	75%	1611	70%	1310	47%	2310	80%	1947	77%	1697	76%
The individual lives in his/her born rural district/department and migrate in an urban area on a circular basis	3	0%	37	1%	170	7%	465	20%	21	1%	0	0%	14	1%	12	1%
The individual lives in his/her born rural district/department and migrate in another rural area on a circular basis	0	0%	6	0%	0	0%	14	1%	0	0%	0	0%	0	0%	0	0%
The individual lives in a urban district/department other than that of birth	331	14%	97	3%	60	3%	93	4%	24	1%	17	1%	34	1%	0	0%
The individual lives in a rural district/department other than that of birth	542	23%	58	2%	77	3%	26	1%	754	27%	101	3%	88	3%	208	9%
The individual lives in a foreign country	4	0%	119	4%	0	0%	46	2%	0	0%	38	1%	0	0%	4	0%
Unobserved	99	4%	120	4%	237	10%	50	2%	277	10%	393	14%	439	17%	305	14%
Total	2373	1	2919	1	2289	1	2310	1	2814	1	2898	1	2541	1	2226	1

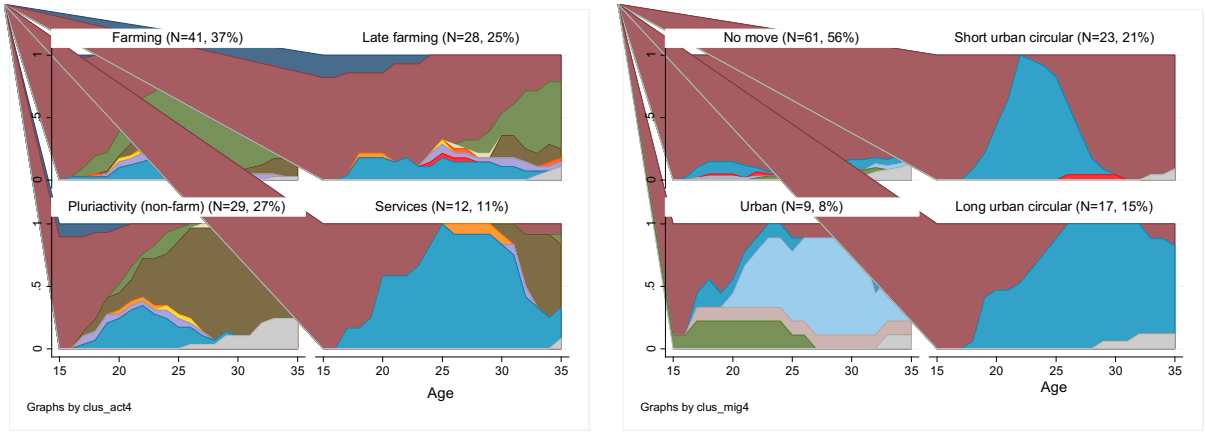
Source: surveys

Appendix 4. Example of sequence analysis in Wake Ngouna area (Senegal) for men transitions

Indexplot (sequences ordered according to the 1st dimension of the MDS)



Chronograms of activity and mobilty



Farming	Farming transition (N=41, 37%) is characterized by individuals born before 1965. There is no significantly representative type of residential transition of this type: some migrated to the city for a few years before starting their farm, others did not. Individuals born after 1980 are not affected by this type.
Family work	Family work transition (N=28.25%) is characterized by individuals who remained living in their rural department of birth during their youth. This type is not associated with a specific cohort. This type of integration is characterized by the start of farming after the age of 25, some of the individuals of this type are still working for their family at the age of 35.
Pluriactivity (non-farm)	Non-farm pluriactivity transition (N=29, 27%), combining farming with activity in the service sector (petty trade, transport, construction) is characterized by individuals born after 1980 who carry out circular migration to cities during the dry season for several years. The old cohort (<1965) is not affected by this type.
Services	Services transition (N=12, 11%) is characterized by individuals who have resided in the city all year round for several years. This type of integration concerns less than 10% of the individuals in each cohort and is not significantly representative of a particular cohort.

Appendix 5. Characteristics of activity and mobility transition types by area and gender (1st table: men; 2nd table: women)

Area		Mpongwe (Zambia)				Ronkh (Senegal)				Choma (Zambia)				Wake Ngouna (Senegal)			
	Transition type	Non-farm	Agric. pluri	Services	Non-farm pluri	Agric. pluri	Long schooling	Family work	Farming	Long schooling	Agric. pluri	Non-farm pluri	Farming	Farming	Family work	Non-farm pluri	Services
Average duration of the state(%)	Number of individuals	15	19	28	28	28	14	35	22	22	12	16	34	41	28	29	12
	Number of individuals (%)	13	17	12	25	20	10	25	16	22	11	15	31	37	25	27	11
	Average number of states	3,1	3,7	2,9	3,3	3,2	3,9	2,8	3,0	3,3	3,3	3,3	3,3	3,1	3,4	3,3	3,3
	School	8	22	20	11	3	**36**	2	5	**28**	11	18	13	0	3	1	1
	Family work	37	7	13	11	28	16	**61**	16	22	12	4	17	55	**70**	40	40
	Own Farm	3	6	2	4	7	15	**24**	**67**	10	15	**12**	**61**	**33**	**12**	18	14
	Agric. Pluri	6	**26**	0	0	**22**	5	1	10	3	**42**	2	2	0	1	2	1
	Non-farm Pluri	0	3	2	**55**	1	5	1	1	4	0	9	3	4	4	**26**	12
	Agricultural wage employment	2	10	0	8	**24**	8	3	0	7	0	2	0	1	0	1	2
	Forestry/Fishing	0	0	0	4	0	0	2	0	1	0	1	3	1	2	0	2
	Activity related to the agricultural sector	0	6	0	0	1	0	0	0	2	21	0	0	0	0	3	0
	Craft/Mechanics	**30**	2	5	0	0	0	4	1	4	0	0	1	2	1	1	0
	Mines or other industry	**13**	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
	Services	1	0	**58**	4	0	7	2	1	11	0	0	0	3	5	5	**28**
	Unobserved	0	19	0	3	14	7	1	0	7	0	51	1	0	1	3	0
Type of pluriactivity	Agricultural wage employment	N.A	71	N.A	0	76	N.A	N.A	N.A	N.A	0	0	N.A	N.A	N.A	0	N.A
	Forestry	N.A	0	N.A	54	0	N.A	N.A	N.A	N.A	0	57	N.A	N.A	N.A	0	N.A
	Activity related to the agricultural sector	N.A	0	N.A	0	18	N.A	N.A	N.A	N.A	100	14	N.A	N.A	N.A	4	N.A
	Craft/mechanics	N.A	7	N.A	21	0	N.A	N.A	N.A	N.A	0	14	N.A	N.A	N.A	11	N.A
	Services	N.A	21	N.A	25	6	N.A	N.A	N.A	N.A	0	14	N.A	N.A	N.A	85	N.A
	Industry	N.A	0	N.A	0	0	N.A	N.A	N.A	N.A	0	0	N.A	N.A	N.A	0	N.A

Area		Mpongwe (Zambia)				Ronkh (Senegal)				Choma (Zambia)				Wake Ngouna (Senegal)			
Transition type		Family work	Non-farm agric	Farming	Farming	Family work	Non-farm pluriac	Farming	Agric. pluriac	Farming	Family work	Non-farm pluriac	Farming	Family work	Farming	Non-farm pluriac	Farming
Number of individuals		33	14	38	49	30	17	32	18	45	25	15	36	31	42	13	20
Number of individuals (%)		25	10	28	37	22	12	23	13	37	21	12	30	29	40	12	19
Average number of states		2,8	3,6	3,8	2,2	2,3	2,9	3,4	2,5	2,3	2,4	3,3	3,6	2,5	2,4	3,2	3,5
Average duration of the state(%)	School	9	7	8	3	3	2	3	0	6	13	8	14	0	0	0	3
	Family work	57	6	9	9	75	46	33	54	7	46	10	6	54	11	14	15
	Own Farm	19	23	38	82	11	4	13	7	85	32	23	22	37	81	4	28
	Agric. Pluri	0	0	8	1	2	6	2	36	0	5	0	0	2	1	22	1
	Non-farm Pluri	1	55	2	0	2	26	2	0	0	0	54	1	1	2	47	2
	Agricultural wage employment	5	0	2	1	1	5	22	0	0	0	0	1	0	0	0	0
	Forestry/Fishing	2	2	0	0	0	0	0	0	1	0	2	0	0	0	0	0
	Activity related to the agricultural sector	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
	Craft/Mechanics	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mines or other industry	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Services	6	2	0	3	2	9	1	0	0	4	2	1	0	1	8	1
	Unobserved	1	3	32	0	1	2	23	0	1	1	1	55	7	4	5	50
Type of pluriactivity	Agricultural wage employment	N.A	0	N.A	N.A	N.A	6	N.A	28	N.A	N.A	0	N.A	N.A	N.A	0	N.A
	Forestry	N.A	8	N.A	N.A	N.A	0	N.A	0	N.A	N.A	20	N.A	N.A	N.A	0	N.A
	Activity related to the agricultural sector	N.A	8	N.A	N.A	N.A	0	N.A	72	N.A	N.A	0	N.A	N.A	N.A	10	N.A
	Craft/mechanics	N.A	0	N.A	N.A	N.A	0	N.A	0	N.A	N.A	0	N.A	N.A	N.A	0	N.A
	Services	N.A	85	N.A	N.A	N.A	94	N.A	0	N.A	N.A	80	N.A	N.A	N.A	90	N.A
	Industry	N.A	0	N.A	N.A	N.A	0	N.A	0	N.A	N.A	0	N.A	N.A	N.A	0	N.A