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# The futures of rural migration in sub-Saharan Africa: A literature review and exploratory essay

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## Abstract

In a context where 200 million more people are expected to live in sub-Saharan Africa (SSA) alone by 2050, the question of the futures of SSA rural migration is of crucial importance in a region which so far as remained essentially rural, in spite of a growing urbanization process. The first aim of this paper is to undertake a comprehensive review of the literature on the futures of rural migration in SSA. Drawing from 37 studies it provides a picture of anticipated drivers and migration patterns. It shows also that to our knowledge, rural migration in SSA is still largely an underexplored field of research. The second aim of this paper is therefore to provide some more insights about this question developing an essay drawing from general knowledge about population flows and specific scenario work connecting alternative global world orders and plausible scenarios of rural transformation into three alternative narratives about rural migration in SSA. This anticipatory work, with no predictive intention, provides some elements of thought regarding future migration patterns and briefly discuss governance-related implications.

## Key words

Futures studies; rural migration; projection, scenario; patterns; Africa; anticipation.

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## Introduction

Recent estimates from the United Nations' demographic projections regarding sub-Saharan Africa indicate that SSA population in 2050 could increase by more than 200 million people, while the projected total population of the continent would reach 2.2 people. Migration being one component of demography along with natality, mortality and fertility will necessarily be affected by this growth of population. What could be the futures of migration in sub-Saharan Africa, and particularly rural migration, defined as the movement of rural inhabitants from their rural areas of origin?

It has been argued that migration forms a demographic sub-system that requires specific attention for exploring its future as, similarly to fertility and mortality sub-systems, it *"is governed by a number of variables, and for each of these variables there is a range of hypotheses, which are combined to produce micro-scenarios for each subsystem, which in turn are combined to produce overall scenarios"* (De Jovenel H., 2004:72).

However, migration is the most unpredictable factor among them, at least for mid-term exploration of the future (10 to 20 years)<sup>1</sup>. All migration components (type, direction, intensity, even existence) are highly volatile. While there is broad knowledge about what can induce, orient and sustain migration, it is almost impossible to predict what will happen locally. Predictions and estimates in environmental migration are highly controversial (Gemene, 2011). Even one of the most frequently agreed-upon driver of migration - climate change - is challenged by authors who stress the lack of empirical evidence and rigorous research on the way climate change and variability impact some economic key drivers of migration such as income differentials, and income variability at place of destination (Lilleør and Van den Broeck, 2011). Unpredictability arises also from the fact that the effect (direction and intensity of change) of a specific driver on migration is not always clear. As for many other complex issues, the reason is that drivers do not operate in isolation. How the evolution of one driver in the future can affect migration will depend on which other drivers will also evolve, and how (RMMS and IMI, 2012).

Yet, it is possible to unveil, explore and understand uncertainties related to migration and use that fore-knowledge to create exploratory scenarios that can guide actions in the present towards more desirable migration patterns. As stated by the OECD: *"Given the interdependence between the different factors driving migration, and the uncertainties in some of the trends, the ability of forecasters to predict the future nature, direction and composition of migration using quantitative approaches and models is limited. An alternative approach is, therefore, to construct future scenarios."* (OECD, 2016a:248).

The purpose of this paper is to explore what Futures Studies say about the futures of rural migration in SSA. The paper entails two broad parts. In the first part, starting with the presentation of the desk study methodology used to gather evidence (Section 1), it presents the results about the content of these studies regarding explicit or implicit drivers of migration (Section 2), and then discusses related migratory patterns (Section 3). The second part is a more specific essay on the futures of rural migration in SSA. It includes a reflection on how global patterns of migration related to climate change and human settlement could impact SSA rural migration, followed by the combination of world order scenarios and scenarios of plausible rural transformations into three narratives about

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<sup>1</sup> We use here "short-term" for periods less than 10 years, "mid-term" for periods between 10 and 40 years and "long-term" for periods over 40 years.

the futures of rural migration in SSA (Section 4). The conclusion focuses on some implications for the governance of rural migration in sub-Saharan Africa.

## 1. Desk review of Futures studies: sources and methodology

### 1.1. Definitions

For the purpose of the desk review we define Futures Studies as : *“A field of studies, focusing on a methodical exploration of what the future might be like”* (GFAR, 2014). Futures studies are a mosaic of approaches, objectives and methods. They notably include: (i) forecast, defined as *“A statement that something is going to happen in the future, often based on current knowledge and trends”*; and (ii) foresight, defined as *“A systematic, participatory and multi-disciplinary approach to explore mid-to long-term futures”* (GFAR, 2014). For ease of presentation, we classify the Futures Studies we identified and analyzed into three categories: *“forecast/projection”*, *“foresight/exploration”* and *“analytical studies”*.

With these definitions and classification in mind, we considered that forecasting studies applied to migration intended to predict migration flows and intensity based on projections, while foresight studies intended to explore alternative migration flows and intensity based on plausible scenarios. Analytical studies have no explicit reference to projections or scenarios, but contain elements of analysis related to drivers and determinants of migration.

We are fully aware that this classification can be challenged and that the boundaries may be sometimes blurred (some studies consider projections as scenarios, and scenarios are sometimes made probabilistic). Therefore, it should not be understood as a normative approach but as (i) a stocktaking exercise; (ii) a practical approach responding to the need for clarity in the analysis of a diversity of literature sources and communication; and (iii) a possible tool to navigate/make use of this literature.

We define here *“drivers”* of migration as factors which induce, orient and sustain migration (Van hear, 2012). We define *“determinants”* or *“key variables”* as the drivers that play the most prominent role within a system of drivers. Drivers are causes and determinants are root causes. Annex 1 offers a table with an option distinguishing, as far as possible, the forces of change in migration which were considered as drivers and those considered as determinants (highlighted in bold characters). This approach was possible for projections and scenarios studies, considering that the variables used for building the models or creating the scenarios were determinants whereas other variables these studies referred to were considered as drivers. In the analytical studies this distinction was less easy and required some subjective assessment.

### 1.2. Search method and criteria

The method for identifying *“relevant”* studies is based first on a thorough search of major journals in the field of Futures Studies<sup>2</sup> using a search process combining sets of keywords as follows *“migration” AND “scenario” AND “Africa”*; *“migration” AND “projection” AND “Africa”*; *“migration” AND “future” AND “Africa”*. The reason for using migration instead of *“rural migration”* and Africa instead of *“sub-Saharan Africa”* is that it provided a larger base of literature sources. This proved to be relevant given the limited number of results we found using this larger combination. The search included titles, abstracts, key words and content. The same combination was used in a second step

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<sup>2</sup> In particular *“Technological Forecasting and Social Change”*, *“Futures”*, *“Foresight”*, and the *“European Journal of Futures Research”*.

for searching web-based literature sources (Scopus, Science Direct, Mendeley...) for articles, books and grey literature.

Publications older than 2000 are not included in the search, as we postulated that information contained in Futures Studies dating more than 15 years back would not significantly alter information gained from more recent Futures Studies. This postulate may be a limitation to the validity of the desk study. Additional research would ensure that it was not the case.

All futures studies identified through the search criteria were then scrutinized to find out whether they really entailed relevant information regarding drivers and determinants, and migration patterns. Those presented and discussed below are selected for implicit or explicit presence of drivers and determinants. We explicitly excluded all studies on demographic change that did not focus on migration (i.e. projections and scenarios of future birth and death rates or based on existing demographic structure). A “relevance” assessment of each study regarding the question of the futures of rural outmigration, drivers, determinants and patterns was done by the author resulting on the following classification and related criteria:

- +++ Highly relevant: study of drivers of rural outmigration in SSA, with migration patterns
- ++ Relevant: study of migration drivers or patterns connected to sub-Saharan Africa, or Africa
- + Somehow relevant: study of migration drivers loosely connected to Africa or study on migration in Africa with loose references to drivers
- +/- Slightly/marginally relevant: implicit information on drivers of migration or migration patterns with loose connection to Africa

## 2. Results: What Futures Studies say about migration

Thirty-seven studies matched our search criteria. Most focus on the impact of migration rather than on drivers, determinants and future patterns; considering migration as a driving force of change in rural areas<sup>3</sup>. Annex 1 displays three tables presenting the main features of these studies, classified according to their type (projection, scenario, other study). In each table, the first column indicates the reference. The second column shows the dimensions of the drivers using a common classification in futures studies: social, technical, economic, environmental and political, also known as the STEEP classification (Saritas and Smith, 2011; Slaughter, 2008; van Notten, 2006). The third column details the nature of the driver(s). The fourth column corresponds to the scale of the analysis. The fifth column provides information on the associated migratory patterns whenever this was possible. The sixth column informs the “relevance” of the study as per the scale defined above.

### 2.1. Forecasting studies (projections)

We found eight studies we considered as relevant from the perspective of informing the futures of rural outmigration in sub-Saharan Africa. The megapatterns study (Valsson and Ulfarsson, 2012) and the EU/JRC studies are the most relevant of this group (++) while the 2017 UN revision of world population prospects was considered as marginally relevant for our purpose. The scale of these studies spans from global (4) to regional and national levels. While all five dimensions are present across the studies, the economic dimension prevails being present in all of them, followed by the social and political dimensions, then the environmental and finally technological dimension. Economic asymmetries are a recurrent driver followed by demography.

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<sup>3</sup> In a four-scenario study for Central Tanzania (Ojoyi et al., 2017), internal migration from other places in the same country is considered as a key driver of local changes affecting in particular the worst scenarios (State of stagnation and State of transition).

## 2.2. Foresight studies (scenarios)

The largest number of the identified studies are scenario-based futures studies (17). Five studies are rated as relevant (++), eight as somehow relevant (+) and four as marginally relevant (+/-). Economic drivers are cited 12 times, followed by the political dimension (mentioned 11 times), the environmental (7), social (6) and technological (5) dimensions. Cross regional and regional scales together are dominant, followed by global scenario studies. Only one case focused on national/intra-national scenarios. Besides global economic asymmetries, local economic situation and income gaps across regions and within regions are the main economic drivers. Political situation and migration policies are recurrent drivers of the political dimension. Climate change and variability are most frequently cited as broad drivers. Water, soil and energy are more specific issues. Similarly, technological innovation is considered as a broad driver while ICTs and farm structures are more specific.

## 2.3. Other analytical studies

Among the twelve analytical studies identified, five are rated ++, one + and six +/- . Half are global studies (6) followed by regional studies (5) and one national study. All dimensions are rather evenly represented with social, economic and political dimensions being the most frequent (6), followed by the environmental dimension (5) and technical dimension (2). Economic drivers are most frequently cited, particularly employment opportunities and economic differentials including poverty and inequity. Environmental drivers refer to climate change globally and more specifically to water, land and ecosystems. Migration policies, political situation, geopolitics, and conflicts and crises characterize the political dimension, while the social dimension is associated with demography and social links. Farm structure and digital gaps correspond to the technological dimension.

# 3. Discussion: determinants and patterns

## 3.1. General observations

A first observation is that the number of studies matching our search criteria is rather limited. Second, as far as we know, there is no futures study with the highest relevance level (+++) corresponding to a specific focus on the futures of rural migration in sub-Saharan Africa. Unless we missed relevant papers in this inventory, this confirms observations made by specialists in the field of migration that the issue of the futures of rural outmigration in sub-Saharan Africa is largely unexplored. The result is a very weak literature regarding an issue of major importance for the future of Africa as a whole and its place in the world.

A third observation is that scenario-based and other futures studies largely outnumber projection-based studies. While the methodology of the inventory does not guarantee that the search was fully exhaustive, and therefore conclusion fully relevant, it is nevertheless striking to witness this difference. A possible explanation is that scenario-based methodologies are better suited for the exploration of the futures of migration due to its high unpredictability. Indeed, authors have warned about the critical issue of accuracy of migration projections and forecast: *“Most of the predictions were affected by the same flaws and biases as were current estimates: a weak or inexistent methodology, and a tendency to use the numbers in order to raise awareness”* (Gemenne, 2011:S44). Migration is very volatile and difficult to predict as it is sensitive to shocks of various nature such as economic crises, military conflict, and policy changes, themselves highly unpredictable (Bijak et al., 2015). Ramirez et al (Ramirez et al., 2015:75) also state that *“Research on the future of international migration conventionally relied on forecasts and probabilistic projections, which suffer from conceptual limitations...”*.

### 3.2. Determinants of future rural migration

Table 1 displays the 25 studies rated ++ (12) and + (13). It includes the determinants of migration and the migratory patterns these induce. The determinants are detailed hereafter using the STEEP classification.

**Environmental determinants** include the generic terminology of “climate change” and “climate variability” and its impacts on temperature and water. Beyond these terms, the studies stress the importance of energy (type and access), and natural resources, particularly water availability, soil quality and population/resource ratio.

**Technical determinants** include broad categories such as technical progress and innovation, technical change, scientific and technical innovation are mentioned without more details. ICT is highlighted and for studies with a focus on agriculture, farm structure and level of farm outputs are seen as determinant factors.

**Economic determinants** are frequently associated with the notion of a differential in the economic situation between countries of origin and countries of destination, triggering migration flows from places with less favourable situations towards more economically attractive destinations. This reflects somehow a “push and pull” vision of the future of migration where less attractive economic local conditions regarding particularly employment, and labour market – especially for the youth – combine with the emergence of more attractive areas abroad or within the country (urban areas). Local poverty and inequalities are also indicated with a particular focus on the level of inclusiveness of growth in SSA countries in general and of urban income growth in particular.

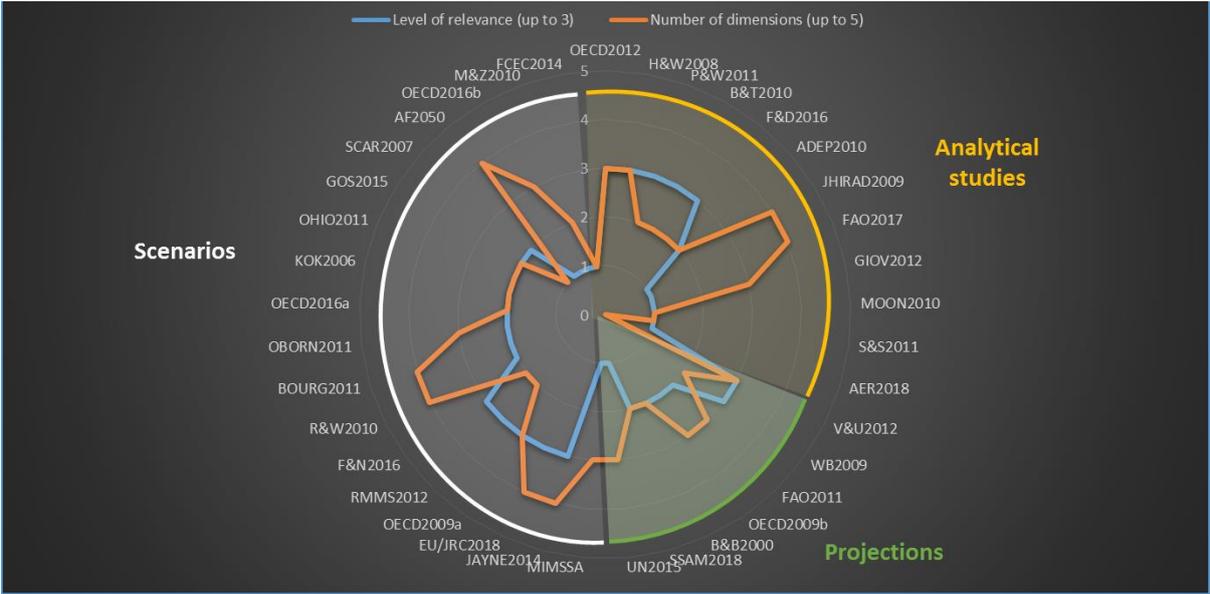
**Political determinants** include a cluster that could be called the global political determinants (global, inter-regional and regional governance) and a cluster related to national political determinants (national governance). National governance includes the capacity of the state, the political system and more specifically national migration policies and investment policies. The future states of this cluster would condition the aspirations of people to move or stay where they live. The global cluster is linked to the global political situation (global and regional governance regimes, geopolitics, migration policies of destination countries). This cluster shapes not only the potential destination of migrants but also the type and intensity of competition between migrants towards countries of destination. War and conflicts, both national and global, appear as wild cards introducing an even higher level of uncertainty in migration patterns.

**Social determinants** include a demographic dimension (growth of population, natural population growth in the cities) which, associated with social development level, the state of institutions and the level of food insecurity in the countries of origin would be shaping the intensity of migration. While historical and linguistic links and social receptivity are seen as shaping the direction of migration, individual characteristics such as education, network connection, and the capability to migrate (associated to development level) determine who migrates. This resonates with the need for a better understanding of the deep drivers of migration, investigating not only the primary causes as indicated above (economic, political, environmental) but also more deeper resorts related to value systems, such as individual aspiration, emancipation, value of diasporic links (ANR, 2012). The importance of these aspects of the social dimension of migration is also emphasized by (Vertovec, 2007:2): *“Through the course of their movement, migrants utilize, extend and establish social connections spanning places of origin and places abroad. By means of such connections or networks, migrants learn and inform each other about where to go, how to get jobs, find places to live, and so on; they also maintain families, economic activities, political interests and cultural practices through such transnational ties. While such networks have practically always functioned among migrants,*

modern technological advances and reduced costs surrounding transportation and communication have allowed for the intensification of transnational connections, practices and mobility.

The determinants of future migration in SSA are not only multiple across economic, social, political, environmental and technical dimensions, they are also interconnected as most of the relevant (++ and +) studies refer to two or more dimensions (Figure 1). The way they are connected is also a source of uncertainty. Several studies recognize for example that the impact of climate variability and climatic hazards would be affecting differently potential migration patterns depending on the economic, social and political conditions where these events took place. Similarly, network connection, linguistic and historical links can be connected with the social receptivity of the migrants and immigration policies in destination countries in opposite ways.

Fig. 1. Distribution of Futures Studies according to type, relevance and number of dimensions



Source: Author

Notes: \* For the relevance level we use the following rating: 3 for ++; 2 for + and 1 for +/-

\* For details of labels see Annex 2

Table 1. Determinants and related rural outmigration pattern of the 25 relevant studies (++ and +)

Reference <sup>1</sup>	Dimension <sup>2</sup>	Scale	Type <sup>3</sup>	Determinants	Pattern
Many more to come? Migration from and within Africa (EU/JRC, 2018)	Ec/P/S/E	Regional (Africa)	SC	Demography; Socio-economic development; Climate change	Scenario 1: continuation of current socio-economic development, population growth, and migration intensity trends. Scenario 2: economic growth triggered by more direct investment, creation of employment in the formal economy, better access to education, faster decline in fertility rates. Scenario 3: climate change producing extended heat waves, higher surface temperatures and disruptions in water cycles particularly affecting populated arid regions (Maghreb, Egypt, Sudan, parts of Southern Africa and the Big Lakes).
International migration study (OECD, 2016a)	Ec/P	Global	SC	Economic asymmetry, economic differential, economic gap; Global Governance, institutional and socio-political frameworks, geopolitical factors; Migration related policies	4 scenarios: Slower shifting wealth; SDG success; Crisis with attempt for co-operation; Rapid automation and conflicts. Each scenario lead to a different migratory pattern
African migration: trends, patterns, drivers (Flahaux and De Haas, 2016)	Ec/P	Africa	ST	Development level; National and regional migration policies	Does not include future patterns but indicate trends such as: More long distance international migration from countries with higher development level; more short-distance regional migration from countries with low development
Regional Migration Governance in the African Continent (Fioramonti and Nshimby, 2016)	Ec/P	Africa	SC	Nature of growth in Africa; political system; regional governance regimes	Stresses the role of internal economic drivers making “home” repulsive or attractive
Sub-Saharan African migration: Patterns and Spillovers (Gonzalez-Garcia et al., 2016)	Ec/S	Regional (SSA)	PR	Demography; Economic differential with developed countries	Projects larger migration flow due to demographic growth towards advanced economies. Predict 2,34% of OECD countries population are migrants from SSA in 2050
Territorial foresight in Mali and Madagascar (Bourgeois et al., 2016b, 2016a)	Ec/Env/P/S	Intra-National	Sc	Informal sector ; Infrastructure development ; Local investment ; Energy (access); Policy orientation; Local capacity of actors; Security	No specific pattern
IIED-Africa’s Evolving Food Systems (Jayne et al., 2014)	Ec/Env/P/T	Africa	SC	Food and energy prices ; The scope of urban income growth; Youth employment; Climate change and variability; Soil quality; Migration and investment policies; Farm structure	4 scenarios. In the Latifundia scenario, there is outmigration from rural areas experiencing land scarcity. Availability of unused land would favour voluntary rural-rural migration.
Connecting with migrant: a global diaspora profile (OECD, 2012)	Ec/P/S	Global	ST	Employment attractiveness differential; migration policies; historical, colonial, linguistic links	Out-migration from SSA to Europe of educated workers but also limits due to immigration policies associated with growing flows of “south-south” migration in Africa. Countries with higher growth rate such as Botswana, Namibia, South Africa or Gabon could become attractive for people that are more educated.
Global migration futures: Using scenarios to explore future migration in the Horn of Africa & Yemen (RMMS and IMI, 2012)	Ec/P	Horn of Africa & Yemen	SC	Economic growth; capacity of the state; military conflict	The Cash Baby! scenario induces large internal rural to urban migration of subsistence farmers and pastoralist and external migration of refugees and displaced people. International migration concerns students and skilled people and become more circular (intra-regional migration). The Jigsaw puzzle scenario induces a migration pattern with both flows of in-migrants to a more stabilized region as well as emigration of a diversity of people to a diversity of destinations.

Megapatterns of global settlements (Valsson and Ulfarsson, 2012)	Ec/Env/T	Global	PR	Spatial localization; Climate change, climate variability; Technological change; scientific and technical innovation	Migration towards the poles, towards coastal areas, towards central areas and areas of concentration of human settlement
Sub-Saharan African urbanization and global climate change (Parnell and Walawege, 2011)	S	SSA	ST	Natural population growth in cities	Argue that natural population growth in the cities is more important than climate change to explain future settlement patterns in Africa
Future Agriculture – livestock, crops and land use” (Öborn et al., 2011)	Ec/Env/P	Global	SC	Labor ; Climate change, climate variability ; Migration related policies	Three patterns resulting from different migration flows: concentration of large cities, growth of town centres and developed rural areas,
FAO perspectives for 2050 on food and agriculture (Conforti, 2011)	S/Env/P	Global	PR	Population/resource ratio ; Income per capita	Outmigration from regions with low income per capita
The future of poverty and development in Africa (Ohiorhenuan, 2011)	Ec/P	Regional (Africa)	SC	Competitiveness, Governance	Four scenarios. No clear migration pattern
Migration and Global Environmental Change Future Challenges and Opportunities Future Scenarios. (Government Office for Science, 2011)	Ec/P	Global	SC	World growth rate Local governance	4 scenarios crossing growth (high/low) X governance (exclusive/inclusive): High/exclusive: ‘gradual’ or ‘routine’ migration to richer economies towards regional economic growth poles. Increased irregular migration by those with assets and capitals, mainly international migration. High/inclusive: voluntary migration to richer economies towards regional economic growth poles; facilitated circulation of migrant populations; secure channels for transmission of remittances; and diaspora involvement in economic and political development. Low/exclusive: More skilled populations from poorer countries relocate to richer economies; limited internal migration of skilled workers in urban centres of poorer economies; increased irregular migration by those with assets and capital. Low/inclusive: Low demand for international migrants; substantial internal migration to areas of higher growth (regional growth poles, coasts).
Issues and trends in international migration in SSA (Adepoju, 2010)	Ec/SI	SSA	ST	Economic situation Employment Political situation Inequality and poverty	Flow of legal and illegal migrants
Millenium economic assessment Order from Stenght scenario (Reilly and Willenbockel, 2010).	S/Ec/T/Env	Global/ regional	SC	Climate change, climate variability. Level of Food insecurity ; Level of farm outputs	mass migration from southern to West and East Africa
Trends and dynamics of international migration in Western Africa (Bossard and Trémoilières, 2010)	Env/S	West Africa	ST	Climate change ; Natural resources Demography ;	Continued growth of international migration fuelled by SSA

Shaping the Future: A Long-Term Perspective of People and Job Mobility for the Middle East and North Africa. (World Bank 2009)	S/Ec	Cross-regional (EU-MENA)	PR	Labour demand in Europe; Labor supply in MENA; Demographic trends in Europe and MENA	Different scenarios based on education profiles and labour force participation rates are used to assess the possibility to compensate for a European aging population through migration from the MENA region. Migration of highly skilled people is favoured. Policies needed for the medium skilled people
The Future of International Migration to OECD Countries (OECD, 2009) (Talwar, 2009), (di Mattia and Cassan, 2009)	Ec/P/S	Cross-regional	SC	Income inequalities in non OECD countries; Global Governance; institutional and socio-political frameworks, geopolitical factors; demography; Education and training; Network; social development level in the countries of origin	Five scenarios: Progress for All; OECD Long Boom; Uneven Progress; Globalisation Falter; Decoupled Destinies. Each scenario is associated with different migration patterns.
Migration pull factors in OECD (OECD, 2009) (Lowell, 2009)	Ec/P/S	Cross-regional	PR	Economic / differential / gap; Labour market; search for jobs; Migration related policies; Demography; Education and training; Network; Social receptivity; value systems	1 - a strong and permanent flow of mixed skilled migrants; 2 - moderate permanent migration flow associated with active recruitment; 3 - moderate and temporary migration flows of skilled migrants, and; 4 - reduced flows of migration restricted to family, or even negative migration flows
Drivers of change in agriculture (Hazell and Wood, 2008)	Ec/P/S	Global	ST	Employment attractiveness differential; war and conflicts	A rural-urban migration determined by a “pull-out of agriculture” factor due to the attractiveness of better jobs in richer and growing economies, and a distress migration where households compensate declining income with jobs in other low-income activities
Foresighting food, rural and agrifutures and (SCAR-CWG, 2007)	Env	Global	SC	Climate change, climate variability ; energy ; water	migration out of regions prone to repeated climate shocks
MedAction European project (Kok et al., 2006)	Env/T	Cross-regional	SC	Water ; ICT ; Technological change; scientific and technical innovation	Migration flows increase in all scenarios at different paces ; water situation is a push of pull factor
Forecasting World’s population (Bongaarts and Bulatao, 2000)	Ec/P	Global	PR	Economic asymmetry/ differential/gap; Globalization level; economic demand, market and trade; Migration related policies	Stable international migration towards traditional industrialized immigration countries, more unpredictable intra-regional migration towards existing and emerging/new poles of attraction

Source: Based on author’s review of literature

Notes: <sup>1</sup> Reference in shade corresponds to studies relevance rated + while the non-shaded references correspond to relevance rated ++.

<sup>2</sup> For Dimension: Ec=Economic; Env= Environmental; P=Political; S=Social; T=Technological

<sup>3</sup> For type: ST=Study; SC=Scenario; P=Projection

## 4. An essay on future patterns of rural migration

The resulting rural migration patterns in SSA that can be derived from this analysis typically consist in two very different generic patterns: a distress migration pattern and a non-distress migration pattern. The first one, which we will not develop here, is associated with a conjunction of highly unpredictable crises of diverse and multiple dimensions (epidemic and pandemic diseases affecting animals and human beings, wars and conflicts, social unrest, economic collapse, financial turmoil, coup d'états, etc.). The effect on migration is not only unpredictable due to the unpredictability of these crises but also due to the socio-economic, environmental and political conditions where they will occur.

The non-distress rural migration pattern is not univocal. Several patterns emerge from the review of the futures studies. These are shaped by i) a combination of global determinants taken from the environmental, economic and political dimensions, ii) the hypothesis that technology itself is not going to play a major role in shaping rural migration in SSA, and iii) a combination of social, economic, political and environmental determinants at country level.

### 4.1. Megapatterns of human settlement and patterns of SSA rural migration

Adapting to Africa the analysis Valsson & Ulfarsson (2012) conducted at global level, it is possible to anticipate some megapatterns of population moves related to the impact of climate change (essentially temperature increase) and the attractiveness of human settlement. One megapattern is a move towards the southern part of the continent, which would experience lower temperature as it is closer to the Pole. Rising heat, lack of water, overpopulation, dwindling resources, and pollution in the central tropical areas of the globe push away people towards areas that are more temperate. Under these circumstances, SSA rural population would be expected to *move towards South Africa, Botswana, Zimbabwe*. Another pattern consists in a move towards cooler coastal areas in very warm and warming countries. Coasts pull people as they offer different types of climate. Increasingly hot and often-dry interiors in already very warm central regions repel, push away human activity and people from the interiors. However, in many sub-Saharan countries coastal areas are not very cool and could also be warming up. The effect on rural population will draw people mostly *towards coastal areas of Southern Africa*. A third pattern is related to the warming of cold high interiors of warm countries, which would draw more activity and people. A reverse push from some coastal areas due to overpopulation or warmer conditions could accompany this move. This could induce rural population movements *towards central areas of Southern Africa and East Africa highlands*. A fourth pattern would be the move of population towards new prospering centres of human activity as these would increasingly attract people and activity, while others decline lacking opportunities to thrive. In SSA, this would lead to movements of rural population *towards attractive existing capital cities, new economic corridors and emerging economies (Gauteng and Western Cape provinces in South Africa, the East African corridor, the coastal West African conurbation)*.

An additional pattern would be the attractiveness of lowly populated and resource-full areas such as the forested areas of the Congolese basin, which would attract people crowding in other highly populated areas.

Figure 2 displays these different moves. It shows that multiple, sometimes convergent, sometimes opposite, flows of migration could take place internally, shaped by the occurrence of contingent events. This makes further more difficult to forecast the volume, origin, and destination of migration in the future.

Fig. 2. Anticipated movements of population related to global patterns of human settlement



Source: Adapted from Valsson & Ulfarsson, 2012

#### 4.2. Patterns of SSA rural migration and global world orders

The clusters of economic and political determinants identified in these futures studies indicate the importance of the future state of the global world order regarding migration. A discussion of the futures of SSA rural migration needs therefore to consider alternative future worlds and how they could shape migration. For this purpose we adapted a seminal anticipatory work that identified four families of global alternative futures as follows (Dator, 2009):

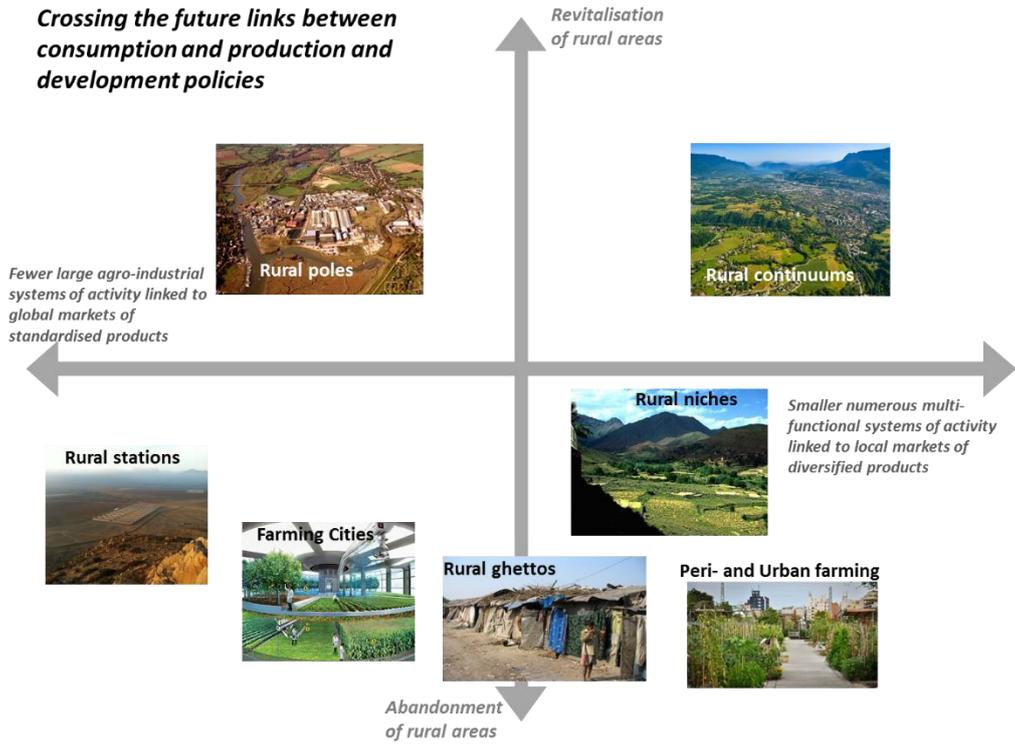
- *Continued growth*: the pursuit of current trends where continued economic growth is seen as the driver of development and the only pathway
- *Collapse*: economic, environmental, resource, moral, or ideological collapse leading to extinction or a significantly lower level of wellbeing/development
- *Discipline*: refocus our economy and society on survival and fair distribution, and not on continued economic growth
- *Transformation*: the transformation of all life, including humanity from its present form into a new "posthuman" form, on an entirely artificial Earth<sup>4</sup>.

We also use an exploratory study of the futures of rural areas, which identified seven plausible configurations (Bourgeois, 2015). Figure 3 displays these configurations along two axes combining respectively the level of investment in rural areas (vertical axis) and the relation between food consumption patterns and food production patterns (horizontal axis).

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<sup>4</sup> We do not include thereafter the "Transformation" scenario, as its occurrence would require a much longer time horizon beyond 2050.

Fig. 3. Seven plausible futures for rural areas



Source: (Bourgeois, 2015)

Table 2 present their characteristics and indicates where in SSA these configurations could take place.

Table 2. Seven plausible rural transformations and their potential location in SSA

Drivers	The Seven Plausible Futures	Where in sub-Saharan Africa
Consumers' preferences for food price above food quality and safety; Globalization of food trade; Concentration and vertical integration of food chains; Automation of production; Land availability.	<b>Rural stations.</b> Gigantic automated agri-plants employ a limited number of workers, unless local poverty makes human labour cheaper. Highly specialized, spatially isolated, hyper-connected to markets through roads, railways, air and maritime freight, and ICT.	Not very suited for SSA, possibly Namibia; mostly in large and less populated areas in parts of South America, Canada and USA, Eastern Europe, Caucasus, Russia, Australia, and mainland China.
Preference for urban life; Public investment in urban areas; Technological breakthrough; High tech connectivity.	<b>Farming cities.</b> High-tech "agriculture" develops in highly controlled environments. Municipalities or private companies own city agri-buildings and employ technicians to produce a diversity of products.	In densely populated areas of more developed countries and as part of all mega-cities
Urbanization; Preferences for urban lifestyles; Demand for diversified food products; Failure of outsourcing food products; Local culinary preferences; Lack of public investment in remote rural areas.	<b>Urban farming.</b> City residents use all available interstitial urban spaces (wasteland, buildings, walls, roofs, terraces...) to grow a diversity of products. They connect to specific consumers through local, short, and segmented chains.	In and around mega-cities particularly in highly populated emerging and developing countries.
High-income consumers preference for high value products, grown in specific areas and certified; Increased connectivity or proximity between specialized producers and specific consumers; Targeted public and private investment.	<b>Rural niches.</b> People find livelihood in exploiting a comparative advantage offered by local features in and outside agriculture. Rural niches attract private and public investment targeting specific market segments producing high quality, high added-value products.	In the best rural areas where local resources make the production of high quality specialized products possible.

Diversion of public and private investment to cities; Natural, social, economic, and health disasters; Remoteness of rural areas; Misery of urban life for the jobless.	<b>Rural ghettos.</b> A marginalized population survive through self-subsistence in abandoned rural areas. They seek employment in gigantic agro-industries (rural stations) around which they settle or through migration of family members.	In deeply rural areas, mountainous areas and near rural stations; also where land concentration will deprive people from the possibility to settle properly.
Limited globalization with restricted free flow of products; standardization of consumers' preferences; risk sharing strategies of agri-food chains; selective public investment in rural infrastructure targeting immediate returns.	<b>Rural poles</b> large-scale core industries transforming a limited number of key products (tree crops, grains, meat, but also non-food products) and limiting production risks by contracting production to a plasma or clusters of smaller farms or households supplying the core industry.	In the hinterlands between cities and deeper rural areas, where land is available and population density not too high.
Shift of consumers preference towards local products; technological breakthroughs for more resilient yet profitable farming systems; public and private investment in rural areas in and outside agriculture; failure of globalisation to satisfy a diversified demand; direct connectivity of producers and consumers; and, individual aspirations and worldviews..	<b>Continuums</b> food production and transformation, and many non-farm activities take place in small, diversified enterprises that are highly connected to local markets and operate in an environment providing connectivity and employment opportunities. "Farmers" have several jobs and directly connect to markets and consumers. Quality of life is similar to that of urban areas.	In moderately dense areas around small to medium size cities

Source: Adapted from (Bourgeois, 2015)

Table 4 combines these seven configurations with the three world orders, highlighting which futures could become dominant in each world order. Three corresponding narratives are further developed, supported by visualizing graphs (Figures 4, 5 and 6) of related anticipated migration flows<sup>5</sup>.

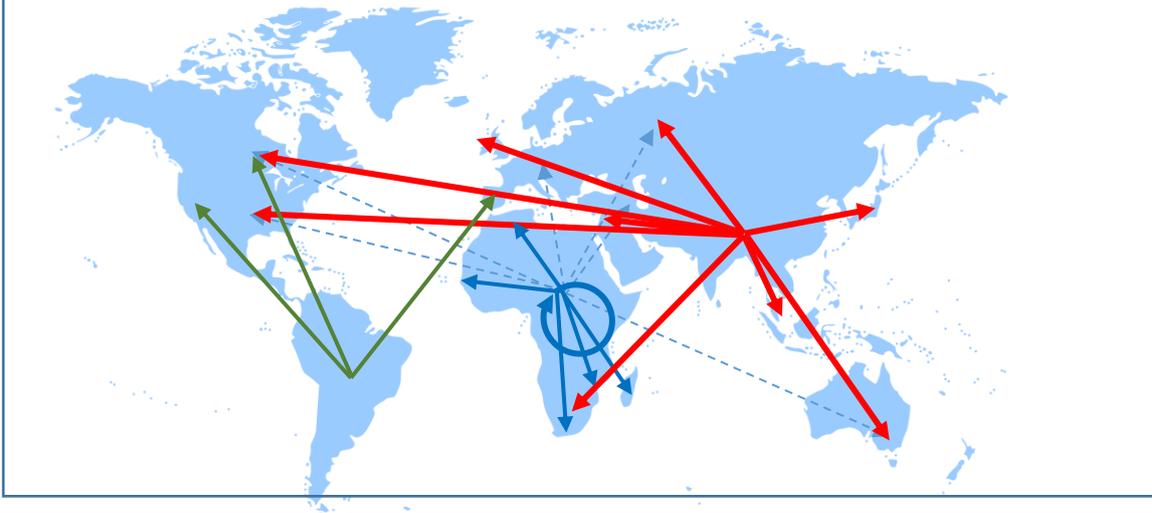
Table 4. Correspondence between world orders and plausible future states of rural areas

	<b>Rural stations</b>	<b>Farming cities</b>	<b>Urban farming</b>	<b>Rural niches</b>	<b>Rural ghettos</b>	<b>Rural poles</b>	<b>Rural Continuums</b>
<b>Continued Growth</b>	xxx	xxx	xxx			xxx	
<b>Discipline</b>			xxx				xxx
<b>Collapse</b>			xxx	xxx	xxx		

**Continued growth:** This is a pattern similar to the trend observed so far, with identical pull and push factors. As urbanization develops, and agricultural production gets more concentrated in large capital intensive/robotized production systems, agro-industrial clusters, and farming cities, rural people tend to migrate more and more towards larger cities within their own countries, developing peri-urban farming or towards more developed countries in their region/world (USA, Canada, Europe, Middle East, Australia). However, SSA international rural migrants have to compete with other non-rural and rural migrants particularly from Asia. The poorest rural migrants are not in a situation to compete with non-rural migrants, and preferential immigration policies in receiving countries shaped by job requirements as well as local social and cultural acceptability limit the outmigration options for rural people. As a result, many of them live in rural ghettos in marginal rural areas or at the periphery of medium and large cities.

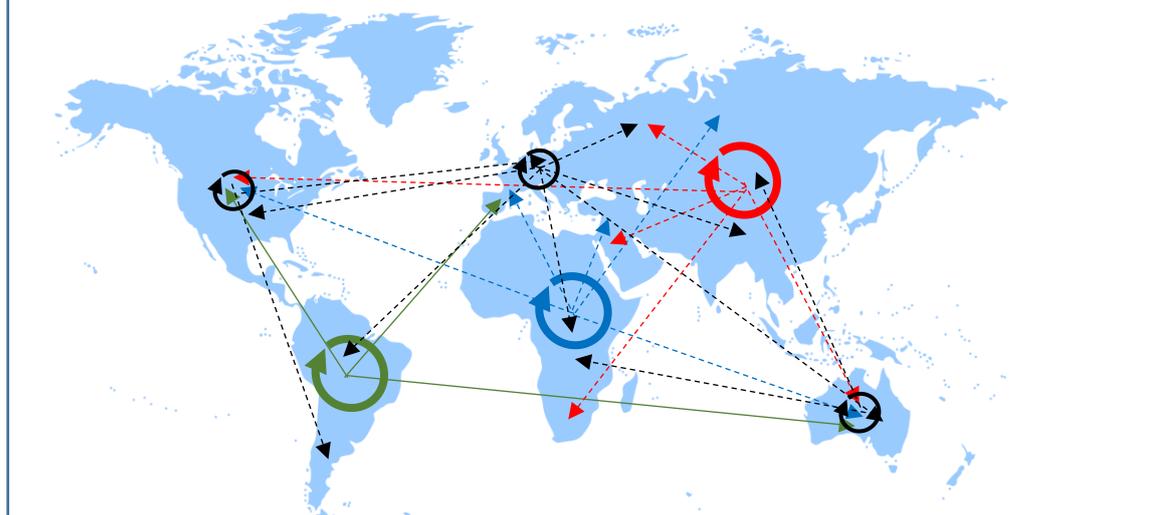
<sup>5</sup> Red arrows: Asian outmigration flows; Blue dotted arrows: non-African destination of rural SSA migrants; Blue plain arrows: continental outmigration of rural SSA migrants; Green arrows: South American outmigration. The width of the arrows correspond to the expected intensity of migration flows (not quantified).

**Continued Growth: Plausible outmigration flows**



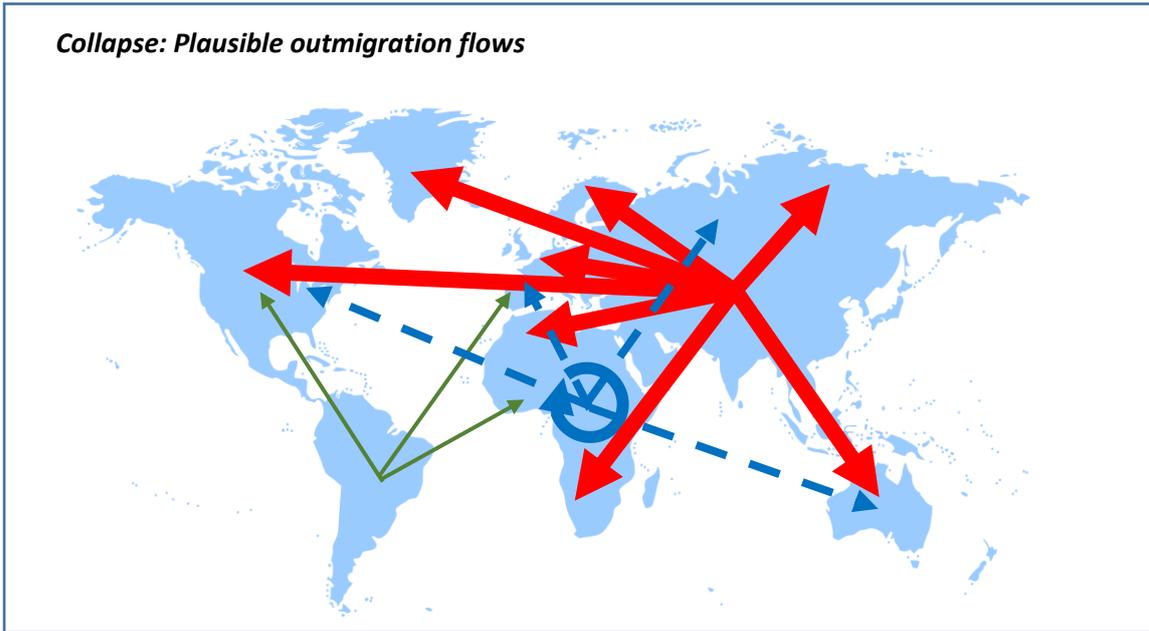
**Discipline:** The refocusing of the economy and society on survival and fair distribution leads to the rehabilitation of rural areas as places providing possibilities for decent living conditions. SSA rural outmigration are limited as the living conditions offered in rural areas are not significantly less attractive than in urban areas and sometime the difference is no longer visible (rural continuums, farming cities). SSA rural migrants migrate by choice and personal preferences. There is no competition for outmigration.

**Discipline: Plausible outmigration flows**



**Collapse:** A massive worldwide migration of the most vulnerable people (from Asia and Africa mainly) occurs from the worst hit places of collapse towards safer places. Tens of millions of Asian migrants and African urban migrants compete with SSA rural migrants. The best chances for potential SSA rural migrants is not migrating but developing local survival strategies based on autarchy and subsistence farming (rural oasis).

### ***Collapse: Plausible outmigration flows***



The three narratives indicate that whatever the alternative world, prospects for massive rural outmigration from SSA are limited. Moreover, they would not offer options that would significantly improve the living conditions rural SSA migrants will have left from their place of origin. This recoups an observation from an OECD study on international migration that: *“It is expected that global competition for labour will intensify, notably for top talent, highly qualified and semi-skilled individuals -- and perhaps even for unskilled workers”* (OECD, 2009:44). In this competition, rural SSA migrants, unless significant local development took place regarding their education, skills and assets, will be among those who will be mostly disadvantaged.

Consequently, it is suggested to pay attention to options where SSA rural migrants will have an advantage, that is, not being forced to migrate. The “Discipline” alternative world offers clues on what this would mean: a refocus on balanced territorial development offering decent livelihoods and fair distribution and use of the resources.

The overall pictures of the future patterns of SSA rural migration, besides distress migration, indicate that outmigration outside of Africa would not be the most feasible option. None of these futures provides an environment where rural SSA migrants would massively find hospitality outside of Africa. As a consequence, unless societal choices are made that would enable SSA rural people to be in a situation to freely chose and have the capability to out-migrate, the largest part of future rural migration will take place within the same country or within the same region, either to land rich areas made more favourable due to climatic transformation or to emerging economies and urban centres. Existing social networks, language similarities and diasporic links will play a major role in shaping the preference and direction of the migrants, a role further reinforced by progress in technological connectivity.

## **The futures of rural migration in sub-Saharan Africa**

This conclusion on the futures of rural migration in SSA takes the perspective that migration is *...part of broader long-term historical processes, rather than as a problem to be resolved”* (Ramirez et al., 2015:75). As such, several questions arise regarding the futures of migration in sub-Saharan Africa to which we intend to provide here elements of thought if not decisive answers.

## Why people would migrate?

Local environmental and technical determinants of moving out of the rural areas are related on one hand to climate variability and how it affects water availability, soil quality and access to energy, and on the other hand to farm structure and how it affects employment, income and use of natural resources. In short rural population depending on ecosystems under growing stress without palliative technological perspective will move out.

Local socio-economic and political issues are other critical determinants of SSA rural migration. They relate to the existence of multiple adverse differentials between the places of origin and the places of destination. The notion of driver complexes is particularly relevant for reflecting on the futures of rural migration in SSA. Adverse differentials take specific forms combining factors such as income per capita, availability of natural resources, technological development, work opportunities, political stability, human security, provision of public goods, state of infrastructure. Most of the studies analysed here point to the interconnected role of demographic pressure on natural resources and agricultural systems, labour opportunities in other regions or countries, and the quality of local governance in shaping the aspiration to migrate.

## Where could people go?

Trends indicate that rural population migration in sub-Saharan Africa will originate from poor rural areas with three alternative destinations: richer rural areas and urban areas in the same, or in neighbouring countries, and urban areas of foreign developed or emerging countries. However, urban areas of non-African countries would be the less preferred option and would represent a minor share of rural outmigration. The reason is that such migration pattern is highly dependent on existing networks, on migration policies of developed countries and on the nature of employment opportunities in these countries, which is expected to be more open to highly educated and skilled migrants for their manufacturing and service sectors. The possibility of rural SSA migration to rural areas of foreign countries outside of Africa is not an option observed in the literature. Reasons are the cost of entry into these rural areas where rural migrants would face a lack of assets and a lack of farming experience in completely new agro-ecological and socio-economic systems.

Intra-Africa rural outmigration intensity and direction will be triggered by the interplay of multiple economic, political, social, environmental and technological determinants operating jointly and creating differentials that will act as simultaneous push and pull factors.

## Where would people go?

As a result preferred rural destinations of rural migrants would be places of peace and political stability, offering land availability, access to water and energy, and farming structures that provide better employment opportunities (self-employment in own farms or hired work in other farms or agro-industrial farms).

Major population movements induced by significant transformation of the climate in Africa would result in migration patterns south towards colder, less dry areas, toward cooler rainier coastal areas that are not in coastal zone danger (sea level rise), and towards the high central plateaus. These patterns will be affected by the attractiveness of dynamic centres concentrating population and economic, social, and cultural assets, which would induce a flow of migration from rural areas to the major metropolises and economic corridors and to emerging African economies that are politically more stable.

Places in sub-Saharan African with available land resources and long lasting or emerging records of peace, political stability, economic growth and food security would attract rural migrants from other SSA countries. Historical links, language and geographic proximity as well as ethnic

concentration will play an increasing role in the destination of the flows of rural out-migrants within Africa as these elements combine to improve the conditions of migration.

### And if it did not work?

However, there is a risk that a convergence in the rural migration flows towards the same destination result in a decrease of social receptivity and acceptance of the migrants if the maximum absorption capacity of the places seen as “safe havens” is exceeded. This situation would initiate social, political and economic tensions. Ultimately, massive concentration of migrants in formerly attractive destinations may turn them into places of dereliction, conflict and further outmigration. It would force rural migrants to look for second- or third-best options, either returning to their place of origin or moving to less favoured but less densely populated areas such as the Congo Basin.

Unpredictability of rural migration in sub-Saharan Africa is due to the uncertainty attached to most of its drivers, whose change of state could cause major havoc or progress. Today it is impossible to predict where and when the next political turmoil or consolidation, the next dramatic or favourable climatic event, the next economic collapse or recovery, the next crisis or turning point will take place.

### What can be done? Towards a new governance of SSA rural migration

This does not mean however that SSA rural migration cannot be governed. By anticipating alternative futures for rural migration in SSA it is possible to develop a pro-active behaviour regarding the governance of migration at local, national, regional and global levels.

What is sure is that if rural migration patterns are only resulting from the aggregation of individual decisions that are determined by adverse local conditions of various dimensions, the aggregate results will be likely undesirable with concentration of people in the areas perceived as the most favourable, turning them rapidly from possible “heaven” to hell due to increasing population pressure.

A pro-active approach means to anticipate these risks and reflect on how to prevent them. The major instrument here is to act with the knowledge of long term implications of the migration patterns and their determinants seen as driver complexes. It means working on these complexes in order to influence rural outmigration in a way that would make it the result of individual aspirations based on a free choice between staying or going (meaning those who prefer to stay can stay and those who prefer to go can go, without being forced by contextual factors).

The knowledge that migration follows trends, and is affected by specific disruptions, makes it possible to pro-actively act and orient the shape of human settlement in SSA. Options include the controlled expansion of large cities, the creation of intermediary cities and the development of small towns. These options are not antagonistic and correspond to the need for more balanced approaches of territorial development in SSA.

In terms of governance, migration is not a problem to be solved but the product of historical processes of trends and disruptions where diverse drivers have interacted often in unpredictable ways. The challenge today with rural migration in sub-Saharan Africa is to ensure that, in line with the 2063 vision for Africa and the SDGs agenda, the decision of a rural person to migrate will be less and less the product of an obligation to move for survival or for better life and more, and more and more the result of an independent choice reflecting an aspiration to experience something different. This requires a major shift in the perception of migration and multi-scale governance systems, which connect the question of migration with broader social, economic and political questions.

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## Annex 1. Synthetic tables of the 33 futures studies

Table 1. Characteristics of futures studies focusing on forecast (8)

Reference	Dimension	Drivers	Scale	Pattern	Relevance
Shaping the Future: A Long-Term Perspective of People and Job Mobility for the Middle East and North Africa. (World Bank, 2009)	Social Economic	Demographic trends in Europe and MENA Labour demand in Europe; Labour supply in MENA;	Cross-regional (EU-MENA)	Different scenarios based on education profiles and labour force participation rates are used to assess the possibility to compensate for a European aging population through migration from the MENA region. Migration of highly skilled people is favoured. Policies needed for the medium skilled people	++
Megapatterns of global settlements (Valsson and Ulfarsson, 2012)	Economic Environmental Technological	Spatial localization; Climate change, climate variability; Technological change; scientific/ and technical innovation	Global	migration towards the poles, towards coastal areas, towards central areas and along spatial population lines	++
Migration pull factors in OECD (Lowell, 2009; OECD, 2009)	Economic Political Social	Economic asymmetry, economic differential, economic gap; Labour market; search for jobs; Migration related policies; Demography; Education and training; Network; Social receptivity; value systems	Cross-regional	1 - a strong and permanent flow of mixed skilled migrants; 2 - moderate permanent migration flow associated with active recruitment; 3 - moderate and temporary migration flows of skilled migrants, and; 4 - reduced flows of migration restricted to family, or even negative migration flows	+
Forecasting World's population (Bongaarts and Bulatao, 2000)	Economic Political	Economic asymmetry, economic differential, economic gap; Globalization level; economic demand, market and trade; Migration related policies	global	stable international migration towards traditional industrialized immigration countries, more unpredictable intra-regional migration towards existing and emerging/new poles of attraction	+
FAO perspectives for 2050 on food and agriculture (Conforti, 2011)	Economic	Population/resource ratio ; Income per capita	Global	Outmigration from regions with low income per capita	+
Sub-Saharan African migration: Patterns and Spillovers (Gonzalez-Garcia et al., 2016)	Economic Social	Economic differential with developed countries; Demography;	Regional (SSA)	Projects larger migration flow due to demographic growth towards advanced economies. Predict 2,34% of OECD countries population are migrants from SSA in 2050	+
Modeling internal migration flows in	Economic Social	Active population Demography	Sub-regional	No specific patterns, but test the predictive capacity of different gravity-type spatial interaction models	+/-

sub-Saharan Africa using census microdata (Garcia et al., 2015)	Environmental	Distance; Rainfall;	(10 countries in SSA)		
2017 revision of the UN World Population Prospects (UNDESA, 2017)	Economic Social Political	Economic asymmetry, economic differential, economic gap; Demography; Crises	Global	International migration are due to large and persistent economic and demographic asymmetries between countries. Top net receivers of international migrants (> 100,000/year) are the USA, Germany, Canada, the United Kingdom, Australia and the Russian Federation. Countries with top net emigration (> 100,000/year) are India, Bangladesh, China, Pakistan, and Indonesia.	+-

Table 2. Characteristics of futures studies focusing on foresight (17)

Reference	Dimensions	Drivers	Scale	Pattern	Relevance
Many more to come? Migration from and within Africa (EU/JRC, 2018)	Economic Political Social Environmental	Demography; Socio-economic development; Climate change	Regional (Africa)	Three scenarios: Scenario 1: continuation of current socio-economic development, population growth, and migration intensity trends. Scenario 2: economic growth triggered by more direct investment, creation of employment in the formal economy, better access to education, faster decline in fertility rates. Scenario 3: climate change producing extended heat waves, higher surface temperatures and disruptions in water cycles particularly affecting populated arid regions (Maghreb, Egypt, Sudan, parts of Southern Africa and the Big Lakes).	++
Regional Migration Governance in the African Continent (Fioramonti and Nshimby, 2016)	Economic political	Nature of growth in Africa; political system; regional governance regimes	Regional (Africa)	Stresses the role of internal economic drivers making “home” repulsive or attractive	++
IIED-Africa’s Evolving Food Systems (Jayne et al., 2014)	Economic Environmental Political Technological	Food and energy prices ; The scope of urban income growth; Youth employment; Climate change, climate variability; Soil quality; Migration and investment policies; Farm structure	Regional (Africa)	4 scenarios. In the Latifundia scenario, there is outmigration from rural areas experiencing land scarcity. Availability of unused land would favor voluntary rural-rural migration.	++
Global migration futures: Using scenarios to explore future migration in the Horn of Africa & Yemen ((RMMS and IMI, 2012)	Economic Political	Economic growth; capacity of the state; military conflict	Regional (Horn of Africa & Yemen)	The Cash Baby! scenario induces large internal rural to urban migration of subsistence farmers and pastoralist and external migration of refugees and displaced people. International migration concerns students and skilled people and become more circular (intra regional migration). The Jigsaw puzzle scenario induces a migration pattern with both flows of in-migrants to a more stabilized region as well as emigration of a diversity of people to a diversity of destinations.	++
The Future of International Migration to OECD Countries (di Mattia and Cassan, 2009; OECD, 2009; Talwar, 2009)	Economic Political Social	Income inequalities in non OECD countries; Growth level in OECD countries Global Governance, institutional and socio-political frameworks, geopolitical factors; Demography; Education and training; Network; social development level in the countries of origin	Cross-regional	Five scenarios: Progress for All; OECD Long Boom; Uneven Progress; Globalisation Falter; Decoupled Destinies. Each scenario is associated with different migration patterns.	++
International migration study (OECD, 2016a)	Economic Political	Economic asymmetry, economic differential, economic gap; Global Governance, institutional and socio-political frameworks, geopolitical factors; Migration related policies	Global	4 scenarios: Slower shifting wealth; SDG success; Crisis with attempt for co-operation; Rapid automation and conflicts. Each scenario lead to a different migratory pattern	+
Territorial foresight in Mali and Madagascar	Economic	Informal sector ; Infrastructure development ; Local investment ;	Intra-National	No specific pattern	+

(Bourgeois et al., 2016b, 2016a)	Environmental Political Social	Energy (access); Policy orientation; Local capacity of actors; Security			
The future of poverty and development in Africa (Ohiorhenuan, 2011)	Economic Political	Competitiveness ; Governance	Regional (Africa)	Four scenarios. No clear migration pattern	+
Migration and Global Environmental Change Future Challenges and Opportunities Future Scenarios. (Government Office for Science, 2011)	Economic Political	World growth rate Local governance	Global	4 scenarios crossing growth (high/low) X governance (exclusive/inclusive): High/exclusive: 'gradual' or 'routine' migration to richer economies towards regional economic growth poles. Increased irregular migration by those with assets and capitals, mainly international migration. High/inclusive: voluntary migration to richer economies towards regional economic growth poles; facilitated circulation of migrant populations, secure channels for transmission of remittances and diaspora involvement in economic and political development. Low/exclusive: More skilled populations from poorer countries relocate to richer economies. limited internal migration of skilled workers in urban centres of poorer economies; increased irregular migration by those with assets and capital. Low/inclusive: Low demand for international migrants, substantial internal migration to areas of higher growth (regional growth poles, coastal areas).	+
Future Agriculture – livestock, crops and land use” (Öborn et al., 2011)	Economic Environmental Political	Labor ; Climate change, climate variability ; Migration related policies	Global	Three patterns resulting from different migration flows: concentration of large cities, growth of town centres and developed rural areas,	+
Millenium economic assessment Order from Strength scenario (Reilly and Willenbockel, 2010)	Economic Technical Environmental	Level of Food insecurity ; Level of farm outputs Climate change, climate variability	Global/ regional	mass migration from southern to West and East Africa	+
MedAction European project (Kok et al., 2006)	Environmental Technological	Water ; ICT ; Technological change; scientific and technical innovation	Cross- regional	Migration flows increase in all scenarios at different paces ; water situation is a push of pull factor	+
Foresighting food, rural and agrifutures and (SCAR-CWG, 2007)	Environmental	Climate change, climate variability ; energy ; water	Global	migration out of regions prone to repeated climate shocks	+
Alternatives futures for global food and agriculture (OECD, 2016b)	Political Social Technological	International cooperation; Attitudes towards sustainable behaviours; Technological innovation	Global	3 scenarios: Individual, Fossil Fuel-Driven Growth Citizen-Driven, Sustainable Growth; Fast, Globally-Driven Growth. A stronger flow of labour out of agriculture-related sectors in the "Fast scenario" with workers moving to other manufacturing and service sectors. These flows are smaller in the "Individual scenario".	+/-

Future change and policy responses for EU food safety and security (Food Chain Evaluation Consortium, 2014)	Environmental	Climate change, climate variability	Regional (EU)	“environmental migration”	+-
African Futures 2050 The next forty years (Cilliers et al., 2011)	Economic Social Political Environmental	Economic growth; Agriculture Demography Governance Natural resources	Regional (Africa)	Four alternative African futures crossing global context (friendly vs harsh) and African governance (weak/parasitic vs development focused): Opportunities lost; Politics of the belly; Arrested development; African renaissance. Only patter of migration is associated with climate change	+-
GEO 4 Global Environment Outlook (Martino and Zommers, 2007)	Economic Political  Social Technological	Globalization ; Global Governance, institutional and socio-political frameworks, geopolitical factors (including international migration policies) Demography; Social receptivity; value systems; Technological change; scientific and technical innovation	Global	Migration due to conflict and environmental degradation or extreme climatic events, such as out-migration of people depending on endangered ecosystems, from coastal areas due to the rise of sea level	+-

Table 3. Characteristics of other analytical futures studies (12)

Reference	Dimension	Driver	Scale	Pattern	Relevance
African migration: trends, patterns, drivers (Flahaux and De Haas, 2016)	Economic Political	Development level ; National migration policies	Regional (Africa)	Does not include future patterns but indicates trends such as: More long distance international migration from countries with higher development level; more short-distance regional migration from countries with low development levels.	++
Connecting with migrant: a global diaspora profile (OECD, 2012)	Economic Political Social	Employment attractiveness differential; Migration policies; Historical, colonial, linguistic links	Global	Out-migration from SSA to Europe of educated workers but also limits due to immigration policies associated with growing flows of “south-south” migration in Africa. Countries with higher growth rate such as Botswana, Namibia, South Africa or Gabon could become attractive for people that are more educated.	++
Sub-Saharan African urbanization and global climate change (Parnell and Walawege, 2011)	Social	Natural population growth in cities	Regional (SSA)	Argue that natural population growth in the cities is more important than climate change to explain future settlement patterns in Africa	++
Trends and dynamics of international migration in Western Africa (Bossard and Trémolières, 2010)	Environmental Social	Climate change ; Natural resources Demography ;	Regional (west Africa)	Continued growth of international migration fueled by SSA	++
Drivers of change in agriculture (Hazell and Wood, 2008)	Economic Political Social	Employment attractiveness differential; war and conflicts	Global	2 types of migration: a rural-urban migration determined by a “pull-out of agriculture” factor due to the attractiveness of better jobs in richer and growing	++

				economies, and a distress migration where households compensate declining income with jobs in other low-income activities	
Issues and trends in international migration in sub-Saharan Africa (Adepoju, 2010)	Economic Political Social	Economic situation; Employment Political situation Inequality and poverty	Regional (SSA)	Flow of legal and illegal migrants	+
The future of food and agriculture - Trends and challenges (FAO, 2017)	Economic Social Political Environmental	Employment opportunities Demography (population growth); Conflicts and crises; Climate change	Global	No migration scenarios, but two migration patterns: Distress migration due to a combination of natural disasters due to adverse effects of climate change and conflicts; non distress migration due to the differential in employment opportunities and socio-economic conditions.	+/-
The future of sustainability and food and agriculture (Giovannucci et al., 2012)	Environmental Technological	Land ; Water ; Farm structure	Global	Rural migration from places facing water scarcity, pressure on land and farming structures reducing local employment	+/-
The Big Picture (Saritas and Smith, 2011)	Environmental	Climate change	Global	No specific pattern	+/-
Impact of IT on migration intentions in rural communities (Moon et al., 2010)	Technological	Digital gap between rural and urban areas	National (Korea)	The IT gap determines rural to urban flows	+/-
Foresight for smart globalization (Jhirad et al., 2009)	Economic Environmental Political	Economic inequality; State of ecosystems; Geopolitical relationships	Global	Rural to urban migration	+/-
Challenges for Africa-Europe relations - A chance to get it right (Mackie et al., 2018)	not specified	not specified	Inter-regional (Africa - Europe)	No pattern analysis. Discusses the place of migration in future Africa-Europe relationship.	+/-

