

# FOOD & MIGRATION

UNDERSTANDING THE GEOPOLITICAL NEXUS IN THE EURO-MEDITERRANEAN



# Food & Migration

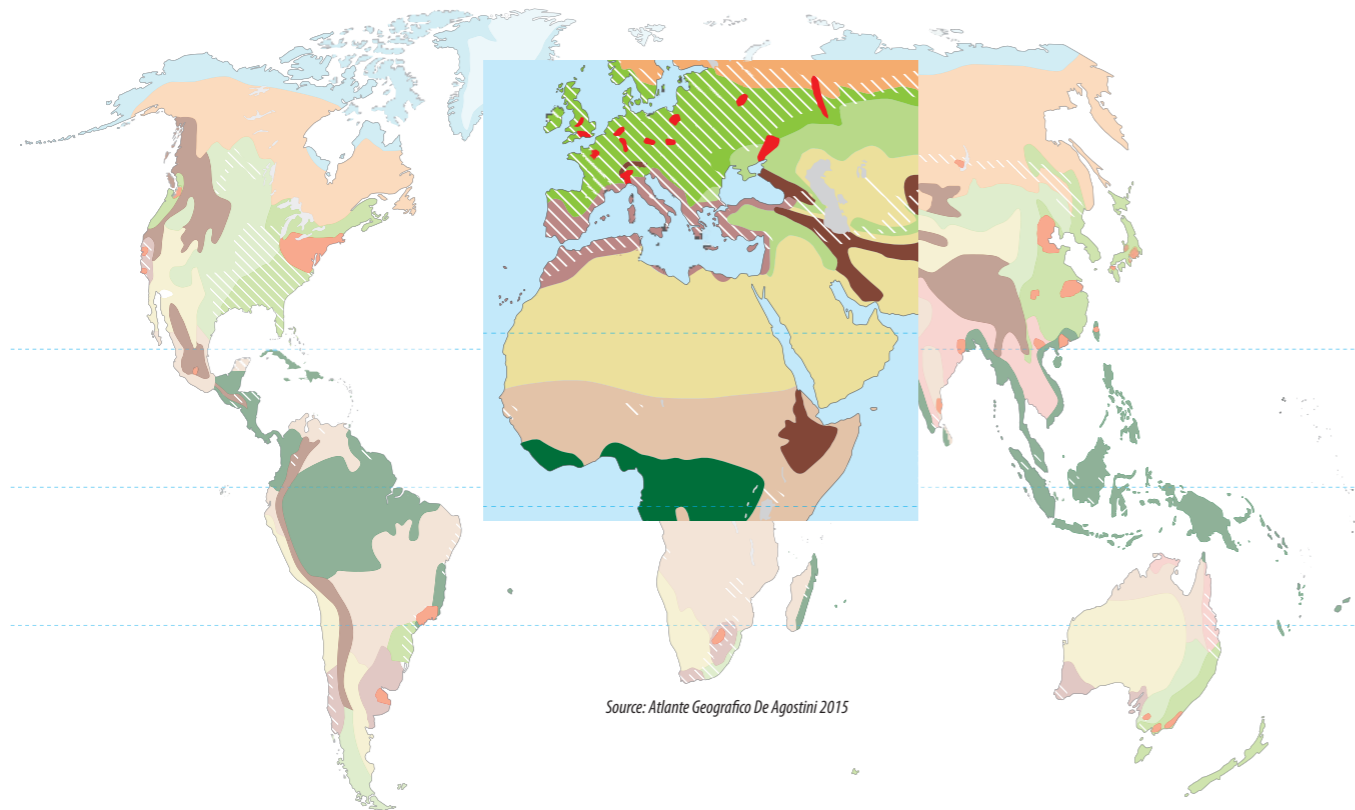
Understanding the geopolitical nexus  
in the Euro-Mediterranean

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## THE EURO-MEDITERRANEAN REGION



Source: Atlante Geografico De Agostini 2015

- DESERTS
- MONSOON REEDS
- TROPICAL FORESTS
- SAVANNAH
- MEDITERRANEAN REGION
- TAIGA
- TUNDRA
- POLARS TERRITORIES
- URBAN AND INDUSTRIAL AREAS
- CUTTING AREAS
- HIGH MOUNTAIN
- TEMPERATE PRACTICES
- TEMPERATE FORESTS

# EXECUTIVE SUMMARY

In an era in which migration<sup>1</sup> is increasingly at the centre of public debate and crucial to the decision-making process, more awareness on the existing links between food and migration is needed.

Against this backdrop, MacroGeo in collaboration with the Barilla Center for Food & Nutrition has conducted an analysis of the geopolitical impact of migration and food in the Euro-Mediterranean area<sup>2</sup>, whose results are comprised in this report on “Food and Migration”. Our study experimentally combines geopolitical analysis (resources, flows, migratory routes) and the analysis of food and nutrition, through a series of different and heterogeneous essays.

Our multidisciplinary research, comprising the contributions of several experts hailing from different fields of research and taking into account the multi-faceted push and pull factors behind migrations, aims to understand two main goals.

On the one hand, to bring food security and nutrition into the discussion surrounding the push factors of migration, also in relation to climate change impacts and to consider food value chains as a lever for local development.

On the other hand, to introduce a research agenda on the socio-cultural changes to food systems in countries of destination due to migration.



In the analysis of food and migration, three keywords are particularly relevant.

**INTERDEPENDENCE:**

*both migration and food emphasize interdependence and connections between different areas and different cultures, in terms of development, risks and opportunities.*

**PARADOX:**

*we need to take stock of paradoxes involving food, including the imbalance between obesity and malnutrition, but also the role of food value chains in order to overcome food losses. We also need to consider paradoxes involving migration.*

*They include paradoxes of over-representation of Trans-Mediterranean migration in comparison to intra-African migration, but also the over-estimation of the level of immigration by the public of several countries<sup>3</sup>.*

**UNCERTAINTY:**

*we live in a time of transition, where adaptation will be progressive and affected by a series of variables. This has to do with strategies to cope with climate change, but also with geopolitical challenges. Therefore, public policy needs to take account of uncertainty to address the transition we live in.*

During the past fifteen years, the number of international migrants globally has grown, reaching 244 million in 2015, up from 222 million in 2010 and 173 million in 2000 (UN 2016). Adding internal migrants, the IOM (2017) considers over 1 billion people as migrants.

Future international migration will be strongly influenced by demographic developments. The 1950-2050 demographic transition in Europe and Africa is unprecedented in its scale: Europe in 1950 accounted for 22% of global population, declining to 7% in 2050, while Africa will surge from 9%

in the 1950s to over 25% of the world's people in 2050. Demographic realities such as these can lead to uneven development which has the potential to disrupt our societies. It is here argued that a strategy of sustainable development, which adheres to the UN Sustainable Development Goals (SDGs)<sup>4</sup> and of co-development (see Lucas 2014) could foster opportunities on both shores of the Mediterranean.

These disrupting trends are only in small part met by a parallel evolution of the socioeconomic reality, which hardly keeps pace – if it does at all – with demography. Africa's economic growth, down to 2.2% in 2016 from 3.4% in 2015, presents stark regional differences: East Africa leads, with an estimated 5.3% in 2016, while Central and West Africa grew at just 0.8% and 0.4% respectively. North (3%) and Southern Africa (1.1%) are somewhat in between.

In this context, high unemployment remains a problem, particularly in middle-income African countries, reaching up to 50% in some of them, while in low-income countries low rates of unemployment often mask high levels of underemployment, which accounts for up to 80% of Africa's labour force. Lack of jobs affects primarily young people, who suffer disproportionately from high unemployment, and given current demographic trends, this challenge will only become more critical. This situation contributes to Africa's income inequality, one of the highest in the world.

The imbalance observed in the economic field reflects in the availability of a critical resource – water. Overall, Africa has about 9% of the world's fresh water and 11% of the population, but there are significant differences in terms of water availability, with Sub-Saharan Africa more affected than other African regions by water-related challenges. According to the WHO (2015), 319 million people in Sub-Saharan Africa still had no access to an improved source of drinking water in 2015.

***No less important than natural water scarcity are land and water acquisition activities carried out by foreign actors for farming/agricultural ends or as a form of commodity speculation.*** In recent years, foreign companies from the Gulf, India, China and Europe have been acquiring millions of hectares of lands (and related water resources) in Africa, with the Nile and Niger rivers as cases in point.

Given the abovementioned environmental, social and economic fragilities, external financial flows – foreign direct investment (FDI), aid and, crucially, remittances – remain of utmost importance for most of Africa. Remittance flows have grown substantially and steadily over the last years, accounting for 51% of private flows in 2016, compared to 42% in 2010. They rose from USD 11 billion in 2000 to USD 64.6 billion in 2016. Being less volatile than development aid and FDI, they represent a lifeline that sustains household consumption, increases foreign currency reserves and allow for investments.

For a comprehensive understanding of the “migration-food nexus”, we jointly analysed countries of origin and countries of destination of migrants. Both food and migration emphasize the nexus: while in the history of the Mediterranean food routes, trade routes and migrant routes were closely intertwined, in today’s Trans-Mediterranean migration routes networks of goods smuggling, including food, often overlap with the activity of human traffickers.

***Furthermore, climate change also affects food, water and land resources, spurring the migration of individuals and communities from the most vulnerable areas.*** Through a dedicated study developed by Euro-Mediterranean Center on Climate Change (CMCC) Foundation, we find evidence of various warming trends and the worsening of drought conditions. Specifically, in the trans-Mediterranean region climate change and variability can lead to a warming around 0.7°C within the next couple of decades, that will more

than double in 2050. During the same timeframe, drought episodes are expected, at least, to double, with significant consequences for agriculture.

For the development of Africa, the link between nutrition and human capital is key, as there certainly is a vicious cycle whereby poverty nourishes hunger, malnutrition and high infant mortality. This cycle fosters an unchecked and unsustainable dynamic among the population.

In countries of destination, a pull factor of migration is demand for cheap labour in agriculture, as shown also by the episodes of exploitation in Southern Europe. Both NGOs’ activity and legislation bear witness to the urgency of tackling this issue.

***The Agenda 2063 of the African Union Commission aims to consolidate the modernization of African agriculture and agro-business, in order to completely eliminate hunger and food insecurity by 2063. In the new framework of the 2030 Agenda for Sustainable Development, we should also consider the role of innovation in food value chains. Highlighting food value chains inefficiencies, we suggest possible solutions to enhance prosperity and environmental and social sustainability, through innovation and multi-stakeholders cooperation.***

Food has the potential to create dynamics of inclusion, helping us to address the unprecedented migration challenge of the next decades. With this in mind, a number of best practices and case studies involving countries of origin as well as those of transit and destination of migration have been selected, providing insight from past experiences, and lessons for the future.

Through this rich mix of quantitative and qualitative data, this report will show that food and nutrition matter. Food and nutrition matter in the perspective of migrants, whether it be for the decision to flee

their homes or during the routes of their journey, or in refugee camps. The “migration-food nexus” matters for all stakeholders engaged in designing sound integration policy.

#### NOTES

<sup>1</sup> The very definition of “migrant” is controversial. We will adopt the International Organization of Migration (IOM) definition. According to the IOM, a migrant is “any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence, regardless of (1) the person’s legal status, (2) whether the movement is voluntary or involuntary; (3) what the causes for the movement are; or (4) what the length of the stay is” (<https://www.iom.int/key-migration-terms>, see also for the definition of refugee). According to the UN (2016), “an international migrant is a person who is

living in a country other than his or her country of birth”. Terms such as “environmental migrant” and “climate refugee” are also controversial (see Kraemer 2017, see the working definition in IOM).

<sup>2</sup> In order to analyze the nexus between food and South-North migration, we have focused on five main areas: Central Europe, Mediterranean Europe, Middle East, North Africa and West Africa, and we have selected 13 countries as major geopolitical players.

<sup>3</sup> According to a Ipsos MORI global survey in 2014, related to 14 countries, the average guess was that 24% of the population was born abroad, when the real figure is 11% (See <https://www.ipsos.com/ipsos-mori/en-uk/perceptions-are-not-reality-things-world-gets-wrong>).

<sup>4</sup> The Sustainable Development Goals (SDGs), also known as Global Goals, build on the experience of the Millennium Development Goals (MDGs) to go further to end all forms of poverty. They require action by all countries to promote prosperity, social inclusion and to protect the planet. The 17 SDGs officially came into force on 1 January 2016.



## NOTE ON AUTHORS AND METHODOLOGY

MacroGeo, a geopolitical research company, has conducted this research on the migration-food geopolitical nexus with the Barilla Center for Food & Nutrition Foundation (BCFN).

For more than two decades, Limes – the Italian monthly journal of geopolitics – has investigated Europe’s geopolitical outlook, the Mediterranean basin and Africa’s main migration hubs. Recent editions specifically focusing on these topics include Limes 5/2015, Limes 7/2016, Limes 6/2017. MacroGeo’s analysis builds on this experience, which involves analysts, academics, activists and policymakers.

Lucio Caracciolo, executive chairman of MacroGeo, and Alessandro Aresu, general manager of MacroGeo, coordinated this research with Marta Antonelli

responsible for the Research Programme of the BCFN. Massimo Livi Bacci has edited the parts on demography. Other main contributors include Luca Di Bartolomei Fabrizio Maronta and Luca Raineri. The study has also benefited from a dedicated cartographic apparatus, thanks to the unique contribution of Laura Canali and Francesca Canali. We also thank Dario Fabbri and Francesca Simmons.

Migration is a multi-faceted phenomenon thus requiring a multi-faceted approach, particularly in exploring its relationship with food. Therefore, the study adopts a variety of approaches in its different sections: geopolitical and geoeconomic analysis (primary sources are indicated, when available), demographic elaboration of the main datasets on regions and countries of interest (including UN

World Population Prospects, FAO Food Security Indicators, Demographic and Health Surveys), interviews, surveys and work in the field regarding the main migration routes, and elaboration on Nielsen and Ibis World data.

The section on “Climate change and human migrations” was conducted by Monia Santini, Luca Caporaso, Sergio Noce and Giuliana Barbato (CMCC – Euro-Mediterranean Center on Climate Change Foundation), building on several datasets on climate (Climate Research Unit (CRU), CLIMDEX database, Global SPEI database, Reanalysis products and East System Model data as elaborated for ISI-MIP initiatives) and on water availability and agricultural production (ERA-Interim Reanalysis and Global Runoff Data Center data, FAOSTAT statistics and ISI-MIP results).

The section on “Migration networks, agricultural production and food networks” benefited from a

series of interviews on the exploitation of cheap labour in Italy, including: Marco Omizzolo, founder of the association In Migrazione, whose work focuses on migrant workers of Punjabi origin in the fields of the Pontine Plain; activist Yvan Sagnet, president of the Association No Cap.

The section on “Sustainable and innovative agro-food systems as levers for rural development and migration flows stabilization” by Angelo Riccaboni and Sebastiano Cupertino (University of Siena) underscores the importance of sustainable food value chains particularly for the economic growth of developing countries, following latest literature insights and feedback produced by experience in the field.

Best practices on migration, integration and food benefited from the collection and analysis of case studies by BCFN researchers Gianna Bonis-Profumo and Michele Pedrotti.

# GEOPOLITICS, MIGRATION AND FOOD

*by Lucio Caracciolo*

The aim of this research is to highlight the often underestimated link between food and migration. This link is investigated here by analysing every aspect that affects it, starting with geopolitical and economic contexts, demographic trends and the impact of climate change. These are all decisive push factors in migrations, a structural phenomenon in the world we inhabit and in which future generations will live. Every crisis-based approach to migratory flows is therefore destined to produce limited or even negative results. It would be equally disastrous to tackle these flows through national agendas that are aimed at unloading the problem onto weaker countries and/or those most exposed to these flows. Only a global strategy, guided by awareness that the

migratory issue affects all humankind and is destined to profoundly influence the planetary ecosystem, can allow balanced and responsible management.

The following analyses are, in particular, concentrated on the Mediterranean area, understood in the broadest possible way: the fault line between migratory flows coming from sub-Saharan Africa and heading for Europe. African migratory routes, which often follow the ancient transit roads used for trade of every kind, starting with food and the other natural products, evolve constantly due to the changing intensity of push and pull factors, as well as the enforcement policies of local governments, which are effectively subsidised by some European countries.

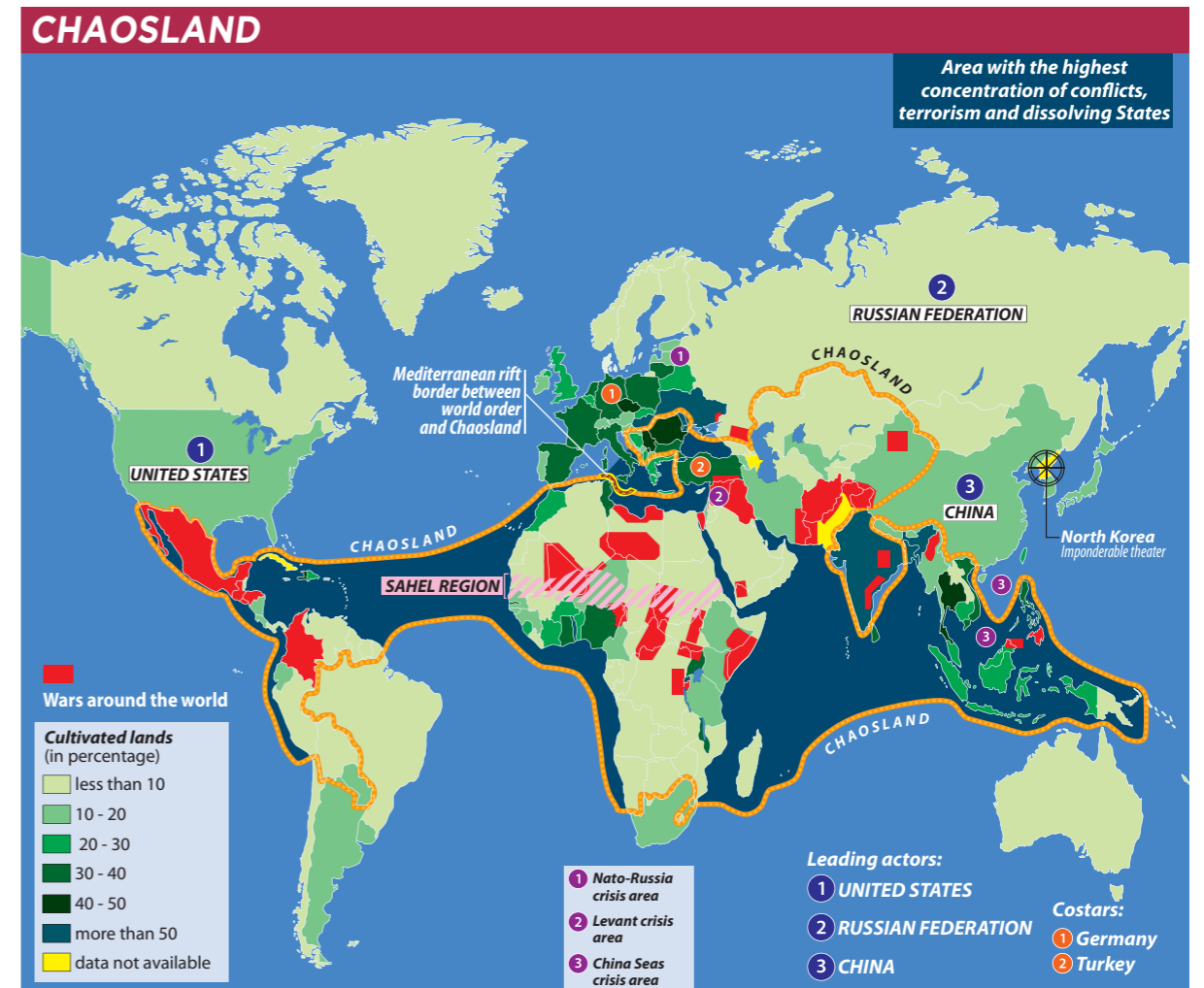
The significant revenue flowing to African populations from migrations – which occur mostly (about 90%) within the continent’s borders, with only a small minority which travels to Europe via the Mediterranean – encourages criminal and terrorist groups to intercept and manage, to their own advantage, the trafficking of human beings. The media’s emphasis on the Mediterranean perspective of the migratory phenomenon often ends up obfuscating its deeper causes and fuels a climate of emergency in global public opinion. It is also for this reason that we have tried here to favour a scientific, analytical approach in the hope of contributing to a better informed and therefore calmer public debate.

With this in mind, the food-migration link is therefore set within the framework of a study of the multiple factors that influence the movement and food culture of individuals and populations, regarding both countries of origin and host countries. Additionally, as the latest World Food Programme report clearly shows, there is a particularly strong link between migrations, food and conflicts: refugee outflows per 1.000 population increase by 0.4% for each additional year of conflict, and by 1.9% for each percentage increase of food insecurity, while “higher levels of undernourishment contribute to the occurrence and intensity of armed conflict” (WFP 2017).

*In the study of the countries of origin, dedicated specifically to sub-Saharan Africa<sup>1</sup>, the emphasis falls on the causes of a vicious circle involving nutrition and migration.* The links that form this chain include skyrocketing demographic growth, inadequate nutrition, interruption of physical growth and of the development of cognitive abilities, and the spreading of chronic diseases with obvious consequences on productivity and the economic conditions of individuals and the community. *The result is a Malthusian trap: poverty produces malnutrition (if not hunger) and high infant mortality which in turn promotes high fertility, which generates poverty.* The cycle then contributes to pushing the younger members

of the population to leave their lands of origin in search of a future that will allow them to break it once and for all. They do this to guarantee the nutrition and therefore the survival, within a family context that is often quite extended, of those who cannot or do not wish to abandon their homes, their lands of origin and their customs. Hence also the importance, attributed here within the framework of recommendations to investment schemes for remittances of which a significant proportion should be reserved for agricultural development, and therefore nutrition, in the countries of origin.

Regarding the host countries, food turns out to be above all a central factor in the integration of migrants in European host countries. Food has increasingly become a distinctive element of the identities (including religious identities) of individuals and communities. The spreading of eating habits and customs from migrant origin countries, particularly from Africa, is changing the European cultural panorama. It is not only a question of diet or preferences, but of the introduction of new cultural codes through the ingredients, rules and cuisine imported by immigrants. This is increasingly reflected by the food industry and markets in Europe. *It is therefore essential for integration projects to rely not only upon basic linguistic and cultural aspects, but also on food, enhancing the contribution of the food customs of migrants, while also encouraging in this field exchanges and contributions through this medium between long-standing and newly-forming communities.* This must especially be done between second generations, where the decisive ‘game’ concerning integration is played out. One cannot ignore the difficulties posed by this approach, because among European populations the differences between nutrition cultures can be exploited by those rejecting every possibility of co-existing with those coming from countries that are perceived as socio-culturally “distant”, with little regard to the geographic meaning of the word.



Source: Atlante Geografico De Agostini 2015 and geopolitical analysis of Macroegeo authors

To seize the importance of the challenge linked to migration and food, it is therefore useful to start from the geopolitical context that conditions it. One perspective to contextualize the Mediterranean as a critical junction is through the geopolitical representation of the world in two broadly defined regions: Orderland and Chaosland<sup>2</sup>.

Here we have two neighbouring worlds defined as much by current asymmetries such as by their long-standing economic, political and socio-cultural linkages. Consequently, the Mediterranean is increasingly an area of friction, of potential conflict and of migrations, which, in the long term, will have a significant impact on Europe’s culture and identity.

Europe, after the 2008 financial and economic crisis, is facing a number of challenges. There is a widespread perception that member states do not share the same interests. There is a visible lack of trust in European institutions and even in the possibility of a common approach to common challenges – starting with migration flows – leading to a tendency to unload problems on one another rather than address them together. The Brexit referendum in the UK may be considered by future historians as the kick-off point for a major reshuffling of the European geopolitical landscape.

As for Africa and the South-East Mediterranean, these are areas struggling with the greatest instability



factors – wars, terrorism, widespread poverty, climate change and its consequences on agriculture and food, and most notably, soaring migration. The latter occurs largely within the region itself, although the media tends to focus on the South-North flows, thus depicting a kind of “invasion” of Europe.

### The primacy of demography

Among the relevant push factors regarding migrations, demography is by far the most important, particularly in the medium and long term, as we show in our analysis on the five main regions making up the Euro-Mediterranean area. Africa’s population already stands at 1.2 billion - by mid-century the number will have doubled, and it will be four times as high by 2100. On the Mediterranean’s northern shore, Europeans number about 700 million (500 million live in EU nations, plus about 200 million in Russia, Ukraine and other eastern European states), with a downward trend predominating, so much so that Europeans are expected to amount to about 650 million by the end of this century, as the global population peaks at about 11 billion. One should also consider that the median age in Europe is about 45, while in Africa it is less than 20. Younger people, especially facing the threat of conflicts and living in miserable environments, will look for any opportunity that may give them some hope for a better future. This is why, in order to assess the impact of migration in the Mediterranean, a thorough consideration of Africa’s economic prospects – both in terms of asymmetries and opportunities – is also necessary.

### Managing urbanization and climate change

Another significant phenomenon and migration driver related to demography is the global urbanization trend. For the first time in history, since 2007 an increasingly large majority of the planet’s population lives in urban environments. Everywhere, huge megacities are attracting people from the countryside. In Africa there are two major

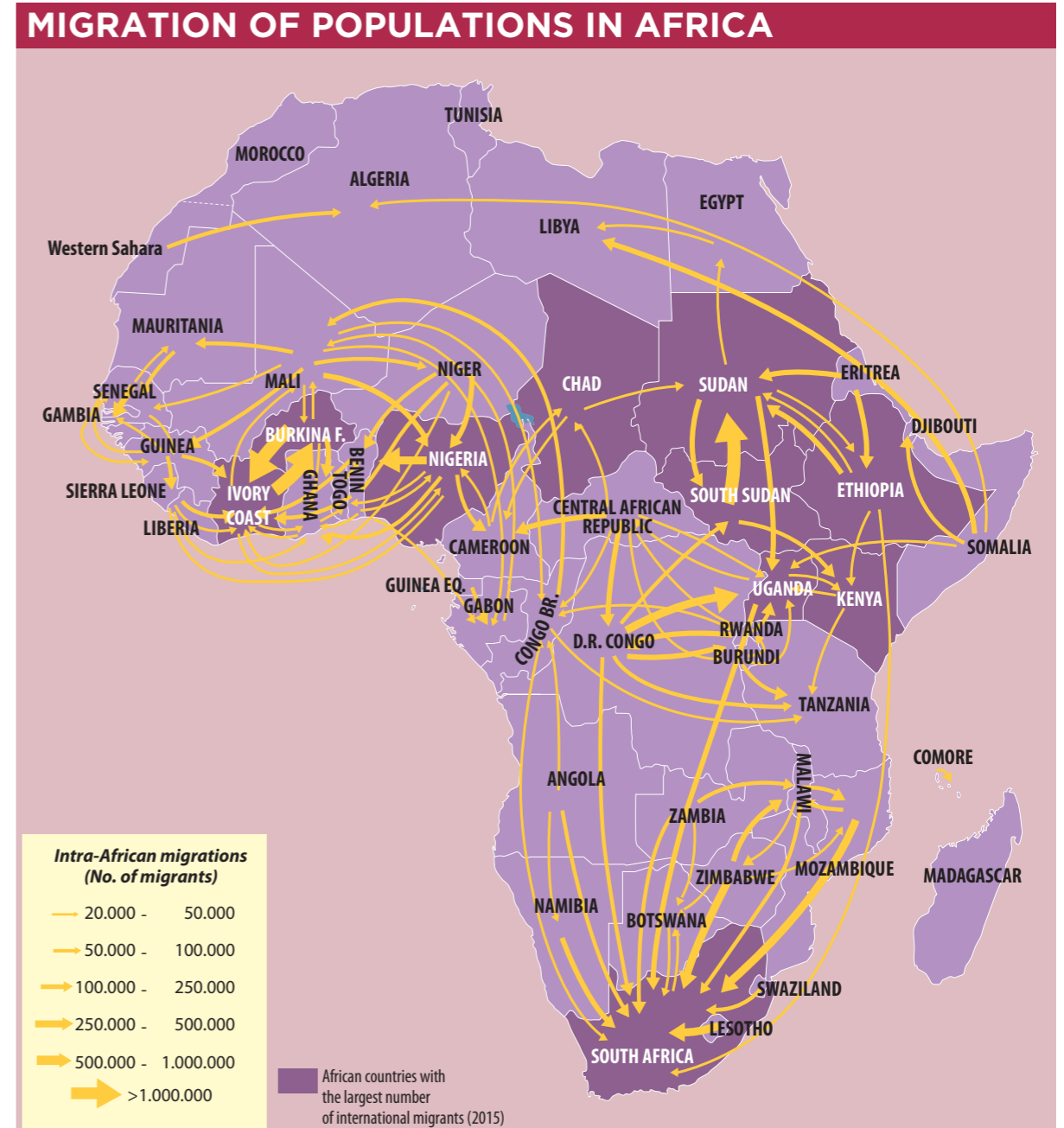
examples of this trend: Lagos (Nigeria) and Cairo (Egypt)<sup>3</sup>. This concentration of people in relatively small areas can bring about a serious decrease in order and stability in these mega-cities as well as a demographic draining of the countryside, with – among other things – an immediate impact on food production. Combining these demographic trends with climate change, one already sees that in most African countries, while demand for water rises exponentially, water supplies are becoming far less reliable. This is another quite significant push factor for North-South (but also South-South) migrations as well as a possible cause of conflict, considering the relevance of land and water acquisition activities in Africa (which will be addressed more fully later). Emphasizing interdependence is key also in tackling climate change, given that it will impact also on food systems in all countries involved in Trans-Mediterranean migration, including European countries of transit and destination.

### State fragility and criminal networks

In this context, the impact of tensions and wars in Northern and sub-Saharan Africa, but also in the Levant and the Greater Middle East, is contributing to the disintegration or fragmentation of states, some of which now exist only on paper, such as Libya, Somalia, Syria, Iraq and Afghanistan. Among other consequences, this means a lack of “phone numbers” available to the leaders of the European states who are interested in finding partners able to monitor and control migration flows. At the same time, human trafficking is a driving factor in most African and Middle Eastern economies. In many cases, governments or individual local leaders are actively participating in migrant smuggling.

### South-South migration

As we highlighted, one should not forget that migrants reaching European shores across the Mediterranean represent but a tiny fraction of the total amount of migration flows worldwide:



Source: UN 2015

dominant narratives tend to underrepresent the fact that the largest share of migration from Africa and Asia is not directed to Europe, but remains within their regions of origin. According to available statistics, 84% of the migrant population originating from West Africa moves inside the Economic Community of West African States (ECOWAS)

area, while diaspora communities from the Horn of Africa are largely absorbed by neighbouring countries, such as Kenya, Uganda, Sudan, Ethiopia and Yemen, and not by Europe (Malakooti et al. 2015; IOM 2017). *South-North migration, in other words, is the exception, while South-South migration remains the rule.*

## The disruption of food systems

While the push and pull factors of migration trends are varied and multifaceted, one can confidently state that food systems are part of the picture. *In the last decades, major migratory flows from and within Africa have been prompted by the disruption of traditional food systems, as a result of climate change and droughts (such as in Sahelian countries in the 1970s); inadequate food policies (as in Ethiopia in the 1980s); or controversial trade agreements (as in many West African countries since the 1990s).* On the other hand, the lack of workers in the agricultural sector in countries on the Northern shore of the Mediterranean has provided a pull factor for migratory flows and has fostered the exploitation of cheap labour. Therefore, more international cooperation is needed to implement all the actions proposed for African agriculture and agro-businesses by the Agenda 2063 of the African Union Commission.

## A long-term challenge

All things considered, it is necessary to come to terms with the fact that migration flows are unstoppable. Corridors may be closed for some time (as now applies to the Eastern Corridor, from Turkey to Greece), but not forever. And in any case, migrants will open new routes, often with help from professional smugglers and mafias.

A comprehensive research agenda on food and migration, which includes the analysis on Africa's migration hubs, can be helpful in managing the long-term geopolitical challenge of interdependence between the two shores of the Mediterranean. Throughout the history of the Mediterranean, food routes and migrant routes were frequently intertwined. A closer look at both shores of the Mediterranean helps us to assess our present challenges.

On the one hand, in Africa's migration hubs, it is key to break a vicious circle where poverty nourishes

hunger, malnutrition and high infant mortality. *Therefore, increasing global attention to Africa's role (where various "Marshall Plans" and "Investment Plans" aim to enhance Africa's immense growth potential) needs to be focused on breaking this Malthusian trap and turning it into opportunities for African agriculture and human capital, consistent with the UN Sustainable Development Goals.*

*On the other hand, European societies are facing and will face a strategic issue, that of integration.* How many foreigners are we able and willing to absorb in our already heterogeneous nation-states? How can we manage the interaction between cultures, customs and religions that are destined to become increasingly significant – and very visible – in the near future? And more specifically, what will the impact of migration be on food cycles and cultures both in countries of origin and those of destination? To this goal, best practices of food integration in Europe need to be analysed and shared.

We believe these fundamental issues demand a far-reaching and interdisciplinary debate. This is why we have gathered experts and consultants hailing from different fields (demography, climatology, economics, migration studies) to explore the "migration-food" nexus in a geopolitical framework, through specific essays and contributions. In this framework, the Sustainable Development Goals for the 2030 Agenda are a constant reference, given their close relationship with food and migration.

We consider this a first step in the collaboration between the geopolitical analysis provided by MacroGeo and the Barilla Center for Food & Nutrition Foundation, which analyses the economic, scientific, social and environmental factors connected to food. In his address at Food and Agriculture Organization for the 2017 World Food Day, Pope Francis reminded that "the relationship between hunger and migration can only be tackled if we go to the root of the problem".

There is an increasing international awareness on the relevance of food and migration for our sustainable future. Specifically, trans-Mediterranean migration flows are an ongoing challenge which requires constant attention by analysts and policymakers. This is why, in the near future, we plan to gather more perspectives in this exploratory field, including from anthropologists, historians, urbanists, activists, and to include more research on the voices of migrants themselves and on policymakers from countries of origin. Also country-based cases studies and the sharing of best practices at the local level might help understand further this topic, its paradoxes and its opportunities, in dialogue with all the relevant stakeholders. To keep up to date with the evolution of the analysis of the migration-food nexus, please visit our website [www.foodandmigration.com](http://www.foodandmigration.com)

Migration is a structural reality all over the world, and in the case of the Mediterranean, is here to stay. Dealing with this phenomenon, its perception and its consequences – anticipated or unexpected – is an important challenge for our societies that demands the best tools. Therefore, a deeper understanding of the migration-food nexus is an important investment today that will bear great dividends tomorrow

## NOTES

<sup>1</sup> We focus mostly on Sub-Saharan Africa to underline its relevance in terms of future demographic and economic growth.

<sup>2</sup> The fault line between Chaosland and Orderland does not imply a value judgement or a necessity. Its purpose is to identify different and intertwined geopolitical realities.

<sup>3</sup> On African megacities, see also Nawrot et al. 2017.



# FUTURE DEMOGRAPHIC TRENDS AND SCENARIOS

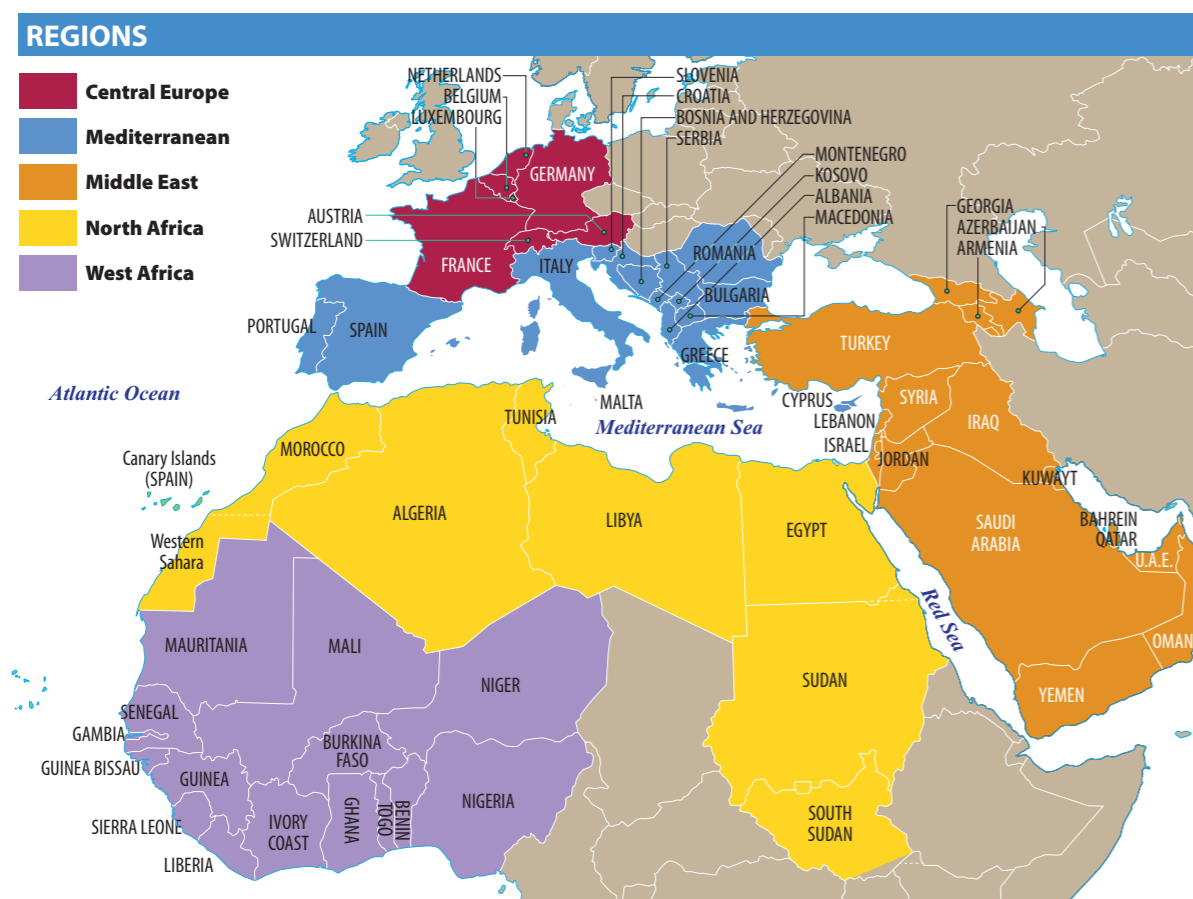
*by Massimo Livi Bacci*

*The main Euro Mediterranean regions are experiencing an unprecedented demographic transition. Analysing and managing this transition properly is key to developing solutions for the stability of societies on both shores of the Mediterranean.*

## **A global demographic revolution**

The world is in the midst of a revolutionary demographic transition and never in modern history has the distance between the main drivers of population change of the different regions of the world been so wide as it is today. In almost all developed countries, and in some emerging societies, fertility is far below the replacement rate,

and life expectancy at birth is 80 years or more. In Europe, in a zero-migration scenario and with birth rates held constant, 33 out of 40 countries would experience population decline before mid-century. In countries of Sub-Saharan Africa, on the other hand, the average number of children born per woman is around 5, the availability of birth control is often limited to small urban élites, survival is precarious, and life expectancy in some countries is



Source: Macroegeo authors

below 50 years. The population of Africa will more than double before 2050. World geo-demography is also rapidly changing: in 1950, Europe accounted for 22% of the world population, but its weight was only 10% in 2015, and will decline to 7% in 2050. On the other hand, Africa had 9% of the world population in 1950 and 16% in 2015, and will exceed 25% in 2050<sup>1</sup>. Different rates of growth – negative in many European countries, between 2 and 4% per year in the sub-Saharan Africa – are closely related to the age structure of the population. In Europe the median age of the population is close to 45, in sub-Saharan Africa less than 20.

*The ongoing demographic revolution has profound social and economic implications.* In mature countries of the north of the globe, population stagnation and decline, and ageing, may imply a slowdown of productivity and innovation, a growing

burden on state budgets for social services, pensions and health; more investment in human capital; and more favourable opportunities for dealing with environmental issues. In the rapid-growth and very young populations, the real challenges are providing adequate nutrition, care and education to the rapidly growing younger generations; the creation of jobs – particularly in agriculture and manufacturing – for the expanding young labour force; and investment in productive infrastructures. Finally, demographic and economic divergences compound their effects and reinforce the push-pull forces which shape international migration flows.

### Different patterns in European and African regions

In order to gain a general view of main drivers of population change, it is useful to compare the trends

POPULATION IN 1950 AND 2015, 5 REGIONS				
REGIONS	POPULATION (000)		POPULATION IN 2015 (1950=100)	RATE OF GROWTH %
	1950	2015		
Central Europe	142,256	190,794	134,1	0.45
Mediterranean Europe	108,633	152,348	140,2	0.52
Middle East	50,957	257,231	504,8	2.49
North Africa	49,222	223,892	454,9	2.33
Western Africa	70,769	353,224	499,1	2.47
<b>TOTAL</b>	<b>421,837</b>	<b>1,177,488</b>	<b>279,1</b>	<b>1.58</b>

Note - Countries of the five regions are:

**Central Europe:** Austria, Belgium, Luxembourg, **France**, **Germany**, Netherlands, Switzerland  
**Mediterranean Europe:** Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Greece, **Italy**, Kosovo, Macedonia, Malta, Montenegro, Portugal, Romania, Serbia, Slovenia, **Spain**  
**Middle East:** Armenia, Azerbaijan, Bahrain, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, **Turkey**, United Arab Emirates, Yemen  
**North Africa:** **Algeria**, **Egypt**, Libya, **Morocco** (Western Sahara), South Sudan, Sudan, Tunisia  
**West Africa:** Benin, **Burkina Faso**, Gambia, Ghana, Guinea, Guinea-Bissau, **Ivory Coast**, Liberia, **Mali**, Mauritania, **Niger**, **Nigeria**, Senegal, Sierra Leone, Togo

of fertility, mortality and migration of five regions within which the push-pull forces which shape international migration operate and intersect. These five regions<sup>2</sup> are: Central Europe, the powerhouse of continental Europe, dominated by France and Germany (whose combined population represents three quarters of the entire region); Mediterranean Europe, where Italy and Spain hold 70% of the total population; the Middle East, with Turkey accounting for one third of the total; North Africa, where Egypt, Algeria and Morocco have 75% of the total population; and Western Africa, dominated by Nigeria, where more than half of the total population lives. Those five regions contain 1.2 billion inhabitants, one sixth of the entire world population; each one of the five regions is relatively homogeneous as far as demography is concerned and shares some common economic, social and cultural features. Table 1 reports the population of the 5 regions in 1950 and 2015, and their annual rate of change over the period considered. Differences are dramatic: between 1950

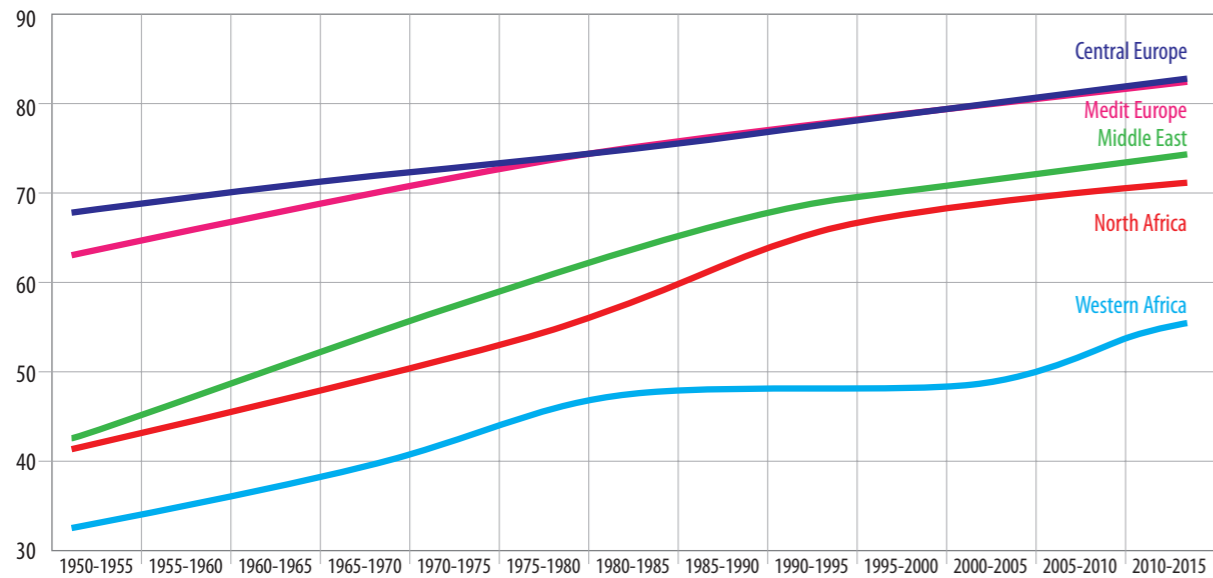
and 2015 the population of the two European regions has increased between 30 and 40% (rate of growth close to 0.4% per year), while the population of the three other regions has increased by around 500% (rates of growth close to 2.5%); in 1950 six out of ten inhabitants of the five regions were Europeans, against three out of ten in 2015.

Past trends offer some guidance for the future: demographic phenomena are deeply entrenched in the history, culture, and social structure of a population, and changes are usually – with exceptions, of course – rather gradual.

*Children per woman, 5 regions, 1950-2015* shows the mean number of children per woman (total fertility rate - TFR)<sup>3</sup> for the five regions, from 1950-55 to 2010-15. Trends are clear: Western Africa has the highest level of fertility, with about 5.6 children per woman in 2010-15, only one unit below the mid-20th century level. Contraception

CHILDREN PER WOMAN, 5 REGIONS, 1950-2015													
Regions	1950-1955	1955-1960	1960-1965	1965-1970	1970-1975	1975-1980	1980-1985	1985-1990	1990-1995	1995-2000	2000-2005	2005-2010	2010-2015
Central Europe	2,39	2,49	2,65	2,47	1,96	1,65	1,62	1,57	1,49	1,52	1,59	1,64	1,66
Medit Europe	2,67	2,60	2,69	2,67	2,54	2,23	1,83	1,56	1,41	1,35	1,37	1,44	1,41
Middle East	6,32	6,09	6,07	5,91	5,70	5,33	4,96	4,47	4,02	3,59	3,21	3,02	2,91
North Africa	6,74	6,83	6,90	6,73	6,40	6,14	5,74	5,10	4,20	3,47	3,13	3,09	3,27
Western Africa	6,39	6,46	6,54	6,60	6,79	6,90	6,84	6,67	6,41	6,14	5,95	5,74	5,54

### EXPECTATION OF LIFE

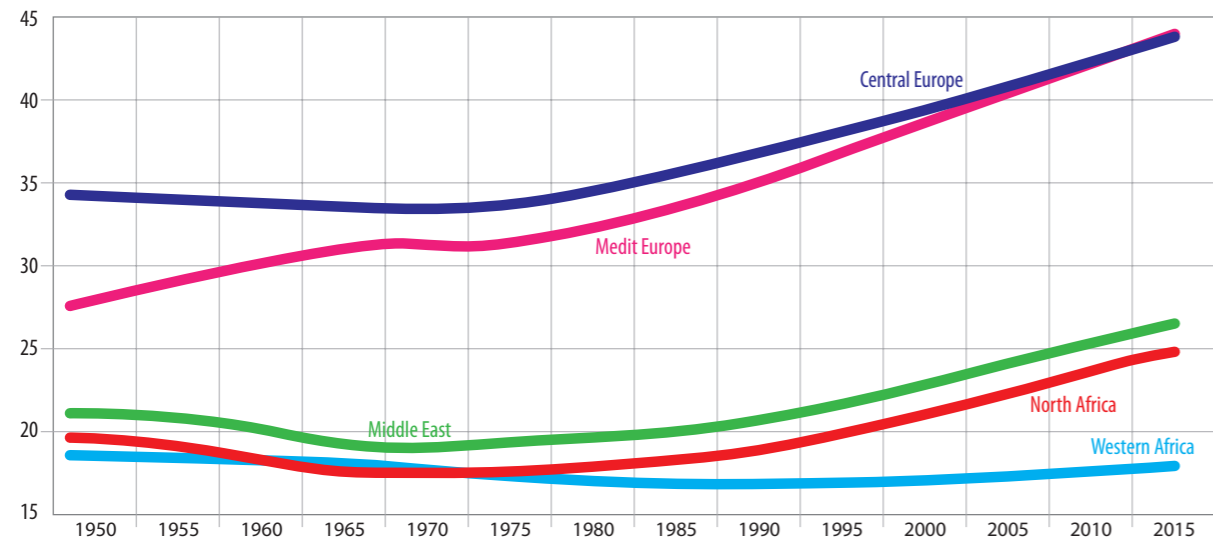


is used only by a minority of couples, marriage age is very low, and almost all women enter a union or marriage. The two European regions have had fertility levels around 1.5 children per woman since the early 70s or early 80s, levels that imply a declining population. The Middle East and North African regions are similar to each other, showing a high fertility rate close to that of Western Africa in the 1950s, and a relatively sharp decline,

particularly in the 1980s and 1990s, followed by a tapering off of the decline in the first and second decade of the present century.

*Expectation of life* reports trends in survival, represented by the life expectancy at birth<sup>4</sup>: in each of the 5 regions progress has been continuous, except in West Africa where it stagnated in the 80s and 90s as a consequence of the HIV/AIDS epidemic. In the

### MEDIAN AGE



two regions of Europe, the curves have overlapped since the 1970s, and life expectancy at birth (for males and females together) is now well above 80, 15 years above the level of the 1950s. The line on the bottom is that of West Africa, which has gained 25 years over the period, but has a life expectancy 23 years below that of the European regions, and 15 years below that of Middle East and North Africa.

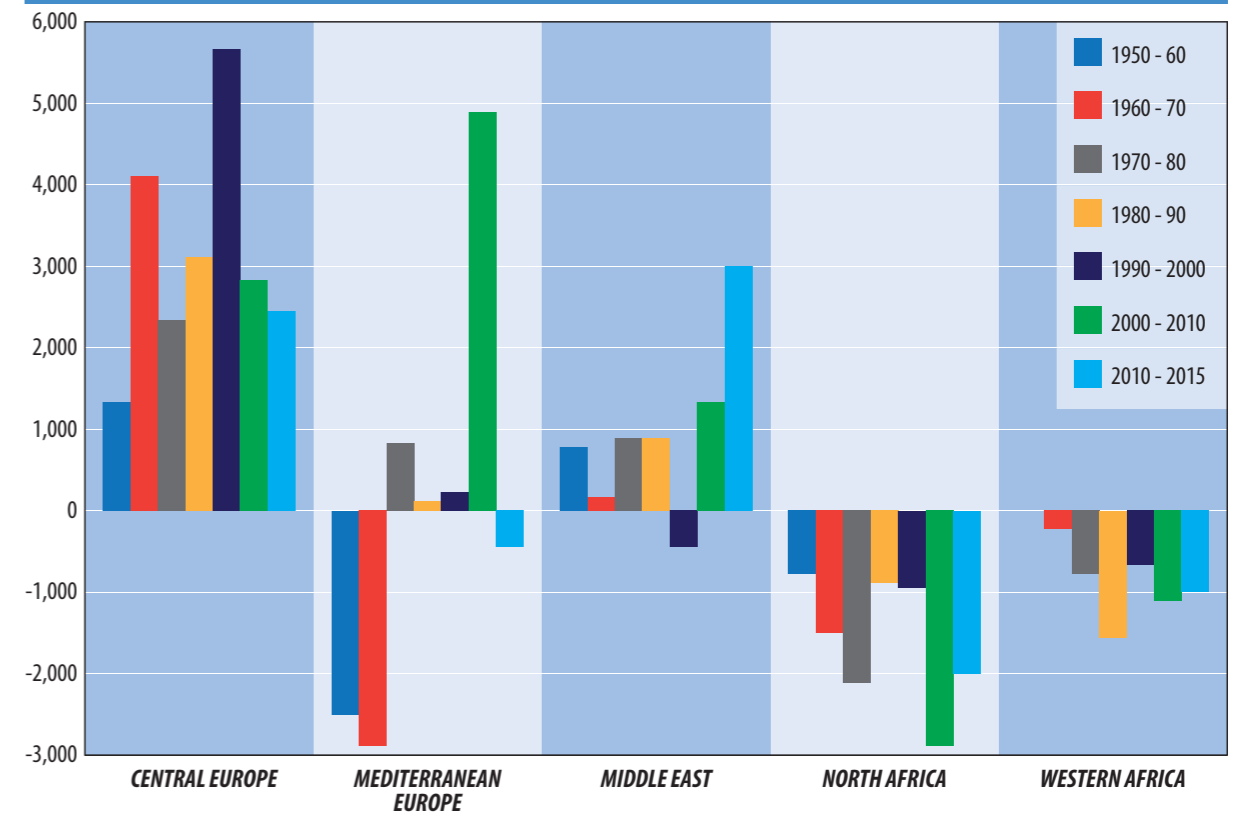
The age structure of a population is determined by its past history of fertility and survival: it is very young in populations with very high fertility and low survival as the three non-European regions were in the 1950s; it is very old in populations with a past history of low fertility and high survival – as in the present day European regions. *Median age in the previous page* shows the dynamic of the median age<sup>5</sup> of the population in the 5 regions, from 1950 to 2015. One can note the almost continuous increase (much steeper in Europe) of the median age after

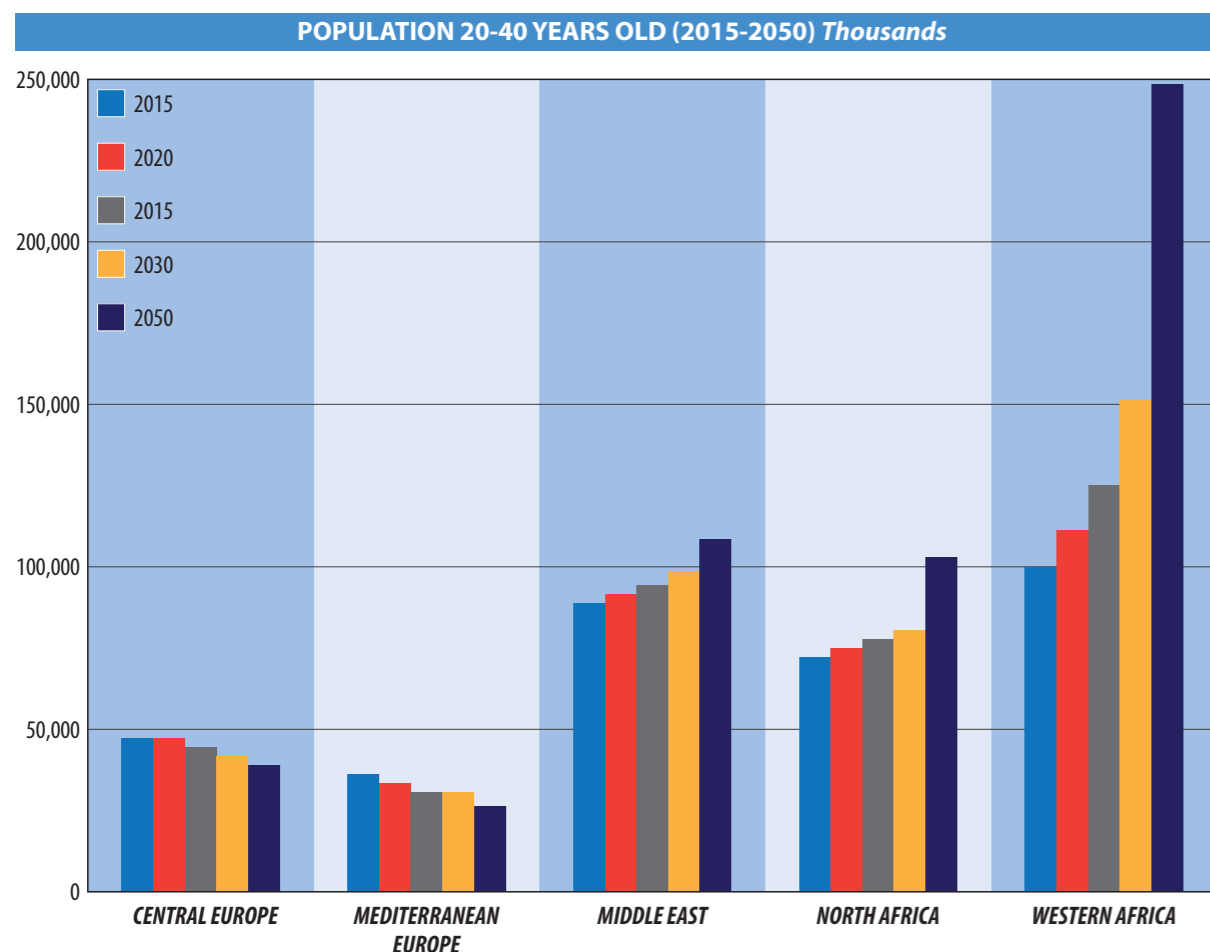
1970 in all regions but Western Africa, where the median age is lower in 2015 than in 1950 (18 years instead of 19). The gap between the European populations (44 years in 2015) and those of the Middle East and North Africa (25-26 years) has increased over time.

*Net migration* reports the volumes of net migration<sup>6</sup> from 1950 to 2015.

Central Europe has attracted immigration throughout the entire period, with a net total of 22 million people. Policies have changed overtime, but the strong economy of the area, its relatively weak demography, and the openness of its societies have consistently attracted a relatively strong inflow of migrants. Mediterranean Europe, on the other hand, responded to the labour demand of the rest of Europe with high levels of emigration in the 1950s and 1960s; in the following decade net migration became

### NET MIGRATION (Thousands)





positive, peaking in the first decade of this century (the balance has returned to negative in 2010-15 as a response to the financial crisis in Europe). The positive net migration of the Middle East area peaked between 2000 and 2015, mainly because of an inflow of refugees and displaced persons moving into the region from the east. The two African regions have lost population through migration over the entire period considered. Outflows have been larger in North Africa than in Western Africa.

A hint at the future migration pressures in the various regions may be gained from *Population 20-40 years old, 2015/2050*, which shows the change of the population of 20 to 40 years old, from 2015 to 2050: a continuous erosion in Europe, a moderate increase in North Africa, an explosion in Western Africa. It is from this age group that the

great majority of migrants is drawn, unable to find suitable jobs in their own country.

### A demographic maelstrom

Within the five regions examined in the preceding pages, 13 countries have been selected as “major players”<sup>77</sup> worth a closer look in order to get a more detailed vision. These 13 major players contain about two thirds of the entire population under scrutiny.

The main *demographic indicators of the major players* are reported *in the next page*. The main drivers of population change are indeed extremely variable in the area considered: fertility in Niger (7.6 children per woman) is almost 6 times that of Spain (1.3); longevity in Italy is 32 years longer than in Cote d’Ivoire; median age in Germany (46.2)

DEMOGRAPHIC INDICATORS OF THE MAJOR PLAYERS						
Major Players	Children per woman (TFR)	Life Expectancy at birth (E0)	Net migration (000)	Median age of the population	% of the population under age 15	% of the population over age 70
	2010-15	2010-15	2000-2015	2015	2015	2015
<b>France</b>	2	81,84	1,562	41,2	24.4	13.2
<b>Germany</b>	1,39	80,65	1,283	max 46,2	min 17,9	16.1
<b>Italy</b>	1,43	max 82,84	3,158	45,9	18.4	max 16.3
<b>Spain</b>	min 1,32	82,27	5,672	43,2	19.4	13.7
<b>Turkey</b>	2,10	74,83	1,850	29,8	34.2	4.9
<b>Egypt</b>	3,38	70,48	- 563	24,7	41.6	3
<b>Algeria</b>	2,93	74,42	- 705	26	36.1	3.9
<b>Morocco</b>	2,56	73,61	-1,584	28	35.9	4.1
<b>Niger</b>	max 7,63	60,65	- 84	min 14,8	max 60.7	1.4
<b>Nigeria</b>	5,74	52,29	- 770	17,9	54.3	1.4
<b>Burkina Faso</b>	5,65	58,07	- 375	17	56.4	min 1.3
<b>Mali</b>	6,35	57,23	- 470	16,2	58.1	1.5
<b>Ivory Coast</b>	5,10	min 50,98	- 540	18,4	53.5	1.7

is 31 years higher than in Niger (14,8), and the proportion of the population over 70 in Italy (16.3%) is twelve times that in Burkina Faso (1.3%). These data underline the demographic maelstrom created by the intersection of rich and poor societies in this area of the world. The divergent forces at work will determine the course of population change in the decades to come.

*Population (thousands) of the major players, 2015-2050* reports the total population of the 13 major players, and their rate of growth in a short (2017-22), medium (2022-30) and long-term (2030-50) perspective. The hypothesis underlying the projection predicts a relatively feeble recovery of fertility in the European countries, and a continuation of the decline in the countries from the

Major Players	POPULATION (thousands) OF THE MAJOR PLAYERS, 2015-2050					RATE OF INCREASE %		
	2015	2017	2022	2030	2050	2017-2022	2022-2030	2030-2050
	<b>FRANCE</b>	64,395	64,939	66,204	68,007	71,350	0.39	0.34
<b>GERMANY</b>	80,689	80,636	80,235	79,294	74,513	- 0.10	-0.15	-0.31
<b>ITALY</b>	59,798	59,798	59,659	59,100	56,513	- 0.05	-0.12	-0.22
<b>SPAIN</b>	46,122	46,070	46,181	45,920	44,840	0.05	-0.07	-0.12
<b>TURKEY</b>	78,666	80,418	83,326	87,717	95,819	0.71	0.64	0.44
<b>EGYPT</b>	91,508	95,215	103,947	117,102	151,111	1.75	1.49	1.27
<b>ALGERIA</b>	39,667	41,064	44,211	48,719	56,461	1.48	1.21	0.74
<b>MOROCCO</b>	34,378	35,241	37,201	39,787	43,696	1.08	0.84	0.47
<b>NIGER</b>	19,899	21,564	26,332	35,966	72,238	4	3.90	3.49
<b>NIGERIA</b>	182,202	191,836	217,256	262,599	398,508	2.49	2.37	2.09
<b>BURKINA FASO</b>	18,106	19,173	22,042	27,244	42,789	2.79	2.65	2.26
<b>MALI</b>	17,600	18,690	21,707	27,370	45,404	2.99	2.90	2.53
<b>IVORY COAST</b>	22,702	23,816	26,792	32,143	48,797	2.36	2.28	2.09

Asian and African continents; however, this decline is projected to be faster in the Western African countries that still have a very high fertility. As for survival, life expectancy is expected to continue its rise, steeper in the countries where it is low. In other words, the projection implies a slow, gradual convergence between countries.

Let us take the largest countries of Europe (Germany) and Africa (Nigeria): in the first, the number of children per woman is projected to rise from 1.4 (2015-20) to 1.6 (2045-50), and life expectancy from 81.5 to 86.1. In Nigeria, fertility is set to decline from 5.6 (2010-15) to 3.5 (2045-50) and life expectancy is set to increase from 53.7 to 62.3. The convergence hypothesis (whereby demographic trends, now so distinct, will become more homogeneous as development evens out the dramatic economic, social, and structural differences between countries) is plausible in the very long run, but less so in the short term, as it will be argued below.

In the short-to medium term, the rates of growth of the 13 countries show stagnation or a slight decline in the 4 European countries, and very high growth in the 5 West African countries, with particularly dramatic statistics for Niger, whose 4% growth rate - if sustained – would imply a doubling of the population every 17-18 years. Turkey, Egypt, Algeria and Morocco make up the middle ground with rates of growth coming in between 0.7% and 1.5% but projected to decline rapidly. One aspect of particular relevance for migration is the ever increasing share of young adults (20 to 40 years) in western African countries: taking Nigeria as an example, the part of the population aged 20-40 will increase 32.4% between 2020 and 2030, against 27% for the entire population.

### Enhancing development to escape the Malthusian trap

There are many aspects of population change in the area under observation that are incompatible

with long term balanced development, and that may produce negative externalities that require painful adjustments. The most evident one is the lack of governance of international migration. Other aspects concern fertility: too low in Europe, too high in Western Africa. History shows that high fertility may be reduced considerably with the right mix of social and economic policies; on the other hand, the nature and efficacy of policies aimed at raising fertility are controversial. In other words, increasing birth rates is far more difficult than bringing them down. A fertility rate of 1.4 – as in Germany, Italy and Spain - implies in the long run a rapidly shrinking and ageing population, which is unsustainable without the support of massive immigration. But the high fertility of West Africa (and of all the sub-Saharan area) is also unsustainable: if present trends continue, it would imply a trebling of the population in the three decades before mid-century. The reduction of fertility and of the rate of growth are therefore a high political and social priority.

High fertility may plunge populous areas into the Malthusian trap mentioned previously: poverty nourishes hunger, malnutrition and high infant mortality which, coupled with high fertility, produce a high rate of growth that generates even more poverty – a vicious circle. Interrupting this pattern was extremely difficult two centuries ago, when Malthus produced his work. However, modern economic, social and scientific capital can provide the means for breaking the cycle. Children's health may be improved and malnutrition reduced, lowering mortality and increasing human capital. Adequate social policies may empower women and help couples to control their fertility and reduce unplanned births. Many countries in Western Africa have developed official policies to this end, but a lack of commitment at all levels (national and local, government and private, religious and civil) has compromised their realisation, far more so than a lack of resources.

High fertility is not the only driver of migration; it has been argued that although economic growth in the whole Sub-Saharan Africa has been relatively high, it has largely occurred outside the most labour-intensive sectors, like agriculture or manufacturing, that have been unable to absorb the growing young labour force. A decline of fertility will slow down the growth of this group and ease the pressure that leads to long run migration: in the short and medium term (say the next couples of decades) only enhanced development may lower that pressure.

In order to offer a more thorough understanding of development, interdependence, and human capital, in the next sections we will provide an analysis of climate change in the main five regions, and we will highlight and explain the key challenge of nutrition for human capital in Sub-Saharan Africa.

### NOTES

<sup>1</sup> In this section, the estimates of past population and projections for the future are based on United Nations, World Population Prospect. The 2015 Revision, New York, 2015. [ <https://esa.un.org/unpd/wpp/>]. Projections are those of the “medium variant”.

<sup>2</sup> Countries comprising each of the 5 regions are listed in Table 1.

<sup>3</sup> The average number of children a hypothetical cohort of women would have at the end of their reproductive period if they were subject during their whole lives to the fertility rates of a given period and if they were not subject to mortality. It is expressed as children per woman.

<sup>4</sup> The average number of years of life expected by a hypothetical cohort of individuals who would be subject during all their lives to the mortality rates of a given period. It is expressed in years.

<sup>5</sup> The age that divides the population in two parts of equal size, that is, there are as many persons with ages above the median as there are with ages below the median

<sup>6</sup> The net number of migrants, that is, the number of immigrants minus the number of emigrants.

<sup>7</sup> The 13 “major players” are: France, Germany, Italy, Spain, Turkey, Egypt, Algeria, Morocco, Niger, Nigeria, Burkina Faso, Mali, Cote d’Ivoire.



# CLIMATE CHANGE AND HUMAN MIGRATIONS

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*Climate change is an important factor in assessing the past, present and future vulnerability of countries of origin, transit and destination of migrants. Over the long term, climate modifications across the Trans-Mediterranean region appear stronger than general global trends. In the future, in the Trans-Mediterranean region climate change and variability could lead to a warming around 0.7°C within the next couple of decades, which will more than double by 2050.*

## Introduction

In the wake of the latest reports published by the Intergovernmental Panel on Climate Change (IPCC 2012; 2014), many initiatives and projects attempted to quantify the current to future vulnerability under climate change for the different countries and regions of the world.

As noteworthy example, the Notre Dame-Global Adaptation Index (ND-GAIN, <http://www.nd-gain.org>) uses 45 core indicators to measure *vulnerability* and *readiness* for more than 180 United Nations countries from 1995 to the present, considering sectors like water, food, health, human habitats, infrastructures, ecosystem services. *Vulnerability is intended as combination of*



*exposure, sensitivity and adaptive capacity*<sup>1</sup>, while readiness regards social, governance and economic ability to leverage investments towards adaptation actions<sup>2</sup>. Similarly, the joint World Food Programme and MetOffice initiative “Food Insecurity & Climate Change” (<http://www.metoffice.gov.uk/food-insecurity-index/>) focused on Least Developed and Developing Countries to investigate their vulnerability to suffer from climate change impacts in terms of food security, under current conditions and in the future. Based on the Hunger and Climate Vulnerability Index (HCVI) from Krishnamurthy et al. (2014), vulnerability was again calculated as combination of exposure, sensitivity and adaptive capacity.

*Food security is dependent on climate through impacts on water resources and agricultural production.* Meteorological droughts (lack of rain) often lead to hydrological and agricultural droughts (lack of water in surface to underground water bodies, and of moisture in the soil), so that the fulfilment of crop water requirement is at risk from both the rainfed and irrigation side (Ronco et al. 2017). Moreover, climate variability accounts for up to 60% of yield variability in major parts of the world (Ray et al. 2015) and is thus a crucial factor for food stability. Vulnerability to climate change of water and food security is recognized influencing migration of individuals and communities from the most vulnerable to the less vulnerable areas as an opportunity to adapt (Grecequet et al. 2017). At the 21<sup>st</sup> Conference of Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC), a task force was established to develop recommendations on “integrated approaches to avert, minimize and address displacement related to the adverse impacts of climate change”. *In general, migrations related to slow-onset climate-related events, such as droughts and land degradation, are more lasting than migrations caused by fast-onset events, such as floods, storms, tsunamis or fires.* This is even more true where the high vulnerability to climate change coincides with other drivers, such as conflicts, ethnic polarization, weak political structures and low

levels of economic development (Brzoska, Fröhlich 2015). Conflicts especially can be both a direct driver and a consequence of climate-related migrations because of resources scarcity (Hsiang et al. 2013).

Due to the complexity and spatial heterogeneity of the climate-migration-conflicts nexus, and to enable a more comprehensive understanding, it becomes essential to expand our knowledge about the resources’ vulnerability to climate change, potentially affecting displacements and/or conflicts, in all the countries affected by migrations (origin, transit, destination).

To this end, the observed and expected changes in the exposure and sensitivity to climate hazards, as component of vulnerability assessment, has been analysed, looking at trends and extremes of meteorological conditions, agricultural yield and water availability (proxies of food and water security) along the historical and future periods for the Trans-Mediterranean migrations’ region, which recently deserved particular attention due to the spatio-temporal changeability of routes, people involved and issues triggered (institutional divergences, human rights, cultural diversities, social instabilities, employment conducts, health problems).

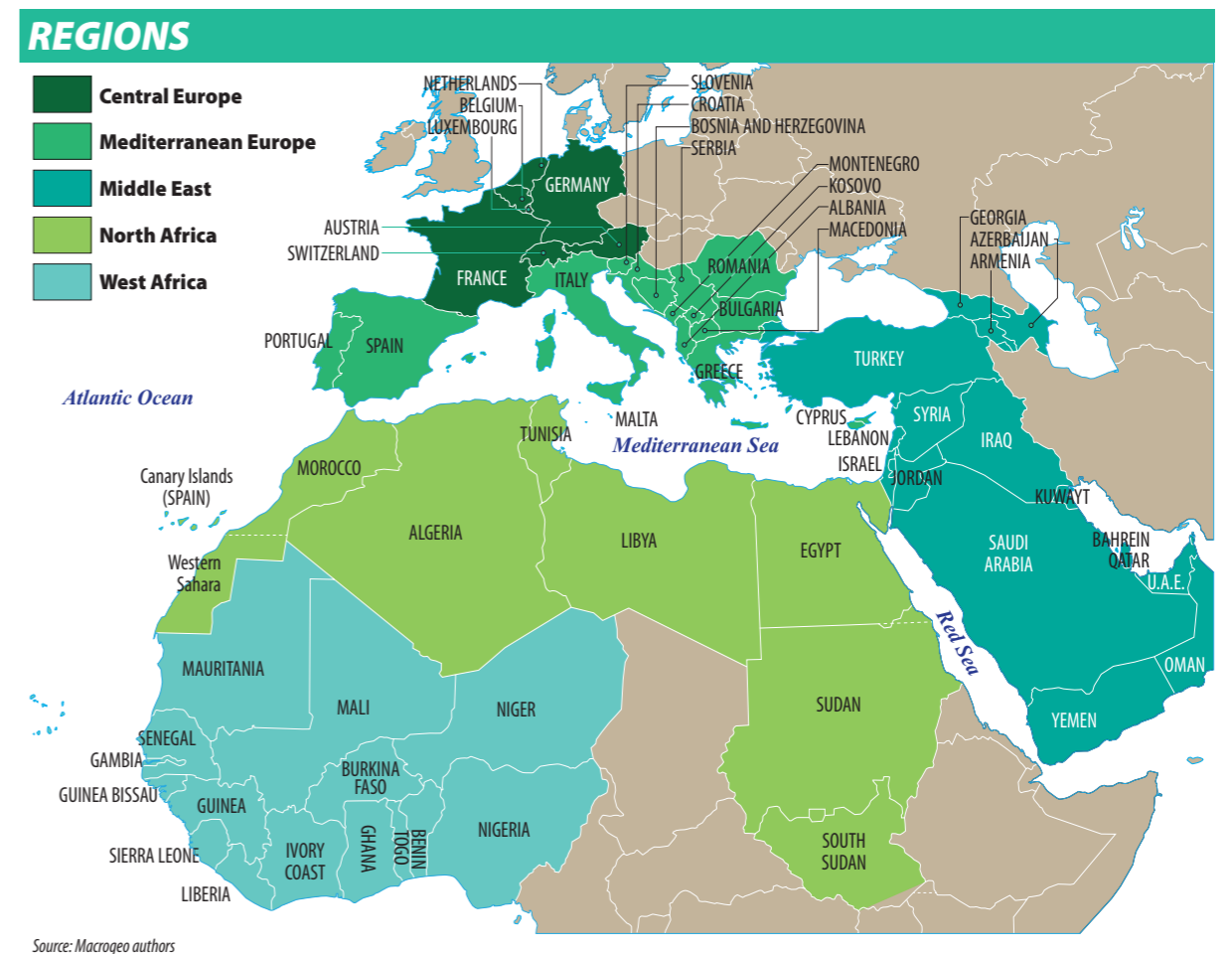
## Methods

The spatial domain of our analysis has been set to cover five regions, each comprising several countries, as listed below:

*Central Europe:* Austria, Belgium, Luxembourg, **France**, **Germany**, Netherlands, Switzerland.

*Mediterranean Europe:* Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Greece, **Italy**, Kosovo, Macedonia, Malta, Montenegro, Portugal, Romania, Serbia, Slovenia, **Spain**.

*Middle East:* Armenia, Azerbaijan, Bahrain, Georgia, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, **Turkey**, United Arab Emirates, Yemen.



Source: Macroege authors

Map of the countries and sub-regions considered in the study.

*North Africa:* **Algeria**, **Egypt**, Libya, Morocco, South Sudan, Sudan, Tunisia, Western Sahara.

*West Africa:* Benin, **Burkina Faso**, Gambia, Ghana, Guinea, Guinea-Bissau, **Ivory Coast**, Liberia, **Mali**, Mauritania, **Niger**, **Nigeria**, Senegal, Sierra Leone, Togo.

The analysis on the regional level was then focused to the 13 major players reported in bold.

In this chapter, both trends and variability of temperature and precipitation are analysed, including extremes events with focus on meteorological droughts, as they drive long-lasting migrations by affecting:

- **water security**, here addressed by examining trends on the surface water availability and hydrological droughts’ occurrence.

- **food security**, here treated by analysing agricultural yield variability for selected key crops, maize, wheat, rice, soybean, which share large part of global cereal and leguminous-oil crop production, cover energy and protein requirements for the human diet, and are largely studied through scientifically sound literature and data also because their importance in the food-feed-bioenergy debate (Di Paola et al. 2017).

To investigate historical trends in climate, as well as in water availability and agricultural production,

the most update and reliable datasets have been searched, selected and elaborated: CRU<sup>3</sup>, CLIMDEX<sup>4</sup>, SPEIbase<sup>5</sup>, ERA-Interim<sup>6</sup> and FAOSTAT<sup>7</sup>. The historical period was analysed from the middle of the 20<sup>th</sup> Century to recent years, and adjusted in function of the temporal coverage of data. Two shorter periods of 20-years, indicatively 1971-1990 and 1995-2014, were then analysed and compared.

Then, future trends were investigated by elaborating climate and impact model-based simulations belonging to the ISI-MIP coordinated initiative<sup>8</sup>, selecting experiments and data under two representative concentration pathways (RCPs) for greenhouse gases (proxy of emission scenarios), assumed having medium to high impact on climate<sup>9</sup>, and under different anthropogenic influence (i.e. irrigated or not irrigated agriculture, with or without human impact on water resources). The reference year of the future analysis was 2005, representative of the 20-year period 1996-2015, to which comparing two future time-frames to evaluate the impact of climate change: 2016-2035 (short term or near future) and 2041-2060 (medium term or far future).

## Results

### Historical analysis

Concerning the observed period, the climate modifications occurred across the Trans-Mediterranean region appear stronger than for the globe. The warming of +1.4°C (corresponding to trends of +0.02°C per year on average) seem spatially homogeneous along the latest 65 years (1951-2015). Such trends were more marked during 1971-1990 (+0.04°C per year), especially across the Iberian Peninsula and the north-west of African domain, and during 1995-2014 (+0.03°C per year) especially in the easternmost part of the domain (Eastern Europe, Egypt and Sudan).

Still from 1951 to 2015, the annual rainfall was reduced on average for about 36 mm (0.55 mm per year) in the domain, reaching decreases larger than 160 mm (2.5 mm per year) for some countries in West Africa. The

period drying faster was 1971-1990, affecting especially European Mediterranean countries and West Africa. Besides trends of decreasing annual rainfall, droughts became more frequent, intense and prolonged, with the maximum length of consecutive days without rainfall increasing by 13 days (i.e. by 1 day every 4-5 years).

Trends and variability of precipitation are well reflected in the hydrological balance, showing how the study region faced a decrease of water availability (each year from 1979-2015, 2 mm less of surface runoff were generated) opposite than the global increase (+0.6 mm per year). Such a land drying was more marked in Sub-Saharan African countries, Central-Eastern Europe and Caucasus.

Results concerning agricultural production show a consistent yield increase along the last five-six decades for the key crops analysed, likely associated to technological development, except for wheat in Nigeria, maize in Morocco and soybean in Mali, that are among the major players of migrations. Nevertheless, a loss of increasing trends and/or trends' statistical significance is found if considering shorter time frames (20 years) and especially the most recent decades 1995-2014, suggesting a rising impact from climate variability, esp. in Africa and Central Europe for wheat, in Africa for maize, and Sub-Saharan Africa for rice and soybean. Peaks of negative yields' anomalies, ranging from -20 to -60%, match with drought episodes, especially from 2005 to 2007 for Spain, from 1997 to 2003 for Italy, in 1976 and 2003 for France and Germany and around 2007 for Turkey. The same matching between drought and yield drop is evinced for Morocco in 1994-1995, 2001 and 2006-2007, for Algeria and Egypt in 1983-1984, and to a lesser extent still for Algeria during 1972-1973. Extended droughts in 1972-1973, 1983-1984 and 1991-1992 also affected West Africa countries in maize, rice and soybean production.

### Future analysis

**Although the observed general yield increases because of technological development, yields are not improving fast enough to keep up with**

**projected demands in 2050 for food, feed and energy.** Moreover, a reasonable development of the agricultural sector, besides being sustainable through maintenance of ecosystem services and climate mitigation, should be **adapted and resilient** to further expected changes in climate and resources' availability, so to reduce likely drops in crop yield due to new uncomfortable conditions (loss of land suitability) for cultivations.

Looking at climate projections, the expected conditions across the Trans-Mediterranean region suggest a spatially homogeneous warming, slightly weaker than for the globe, even if such differences will reduce in the medium term and under the worst emission scenario. More in detail, a substantial warming (from +0.61 to +0.77°C, according to the different emission scenarios considered) might affect the region in the shorter term 2016-2035 period compared to the reference period 1996-2015. The temperature anomaly is predicted to increase homogeneously (+1.44/+2.14°C) in the second period considered (2041-2060) with a warming peak in the Middle East sub-region under the worst emission scenario (+2.32°C). The warming, as averaged across emission scenarios, is shown in **the warming maps in the following pages.**

The maps represent the temperature anomaly for the Trans-Mediterranean sub-regions in the near-term future 2025 (representative of 2016-2035) and the medium-term future 2050 (representative of 2041-2060), in both cases with respect to 2005 (representative of 1996-2015). The anomaly is averaged across different emission scenarios.

For that concerning annual rainfall at global level, it is predicted to increase by ~1% (~9 mm) in the near future (2016-2035) and by ~4% (~30 mm) in the far future (2041-2060) while a weaker increasing up to a decreasing tendency (ranging from +0.5% to -1.4%) is predicted in the Trans-Mediterranean region according to the different emission scenarios and periods considered. At sub-regional level a dual behaviour is observed: a drying trend is predicted to

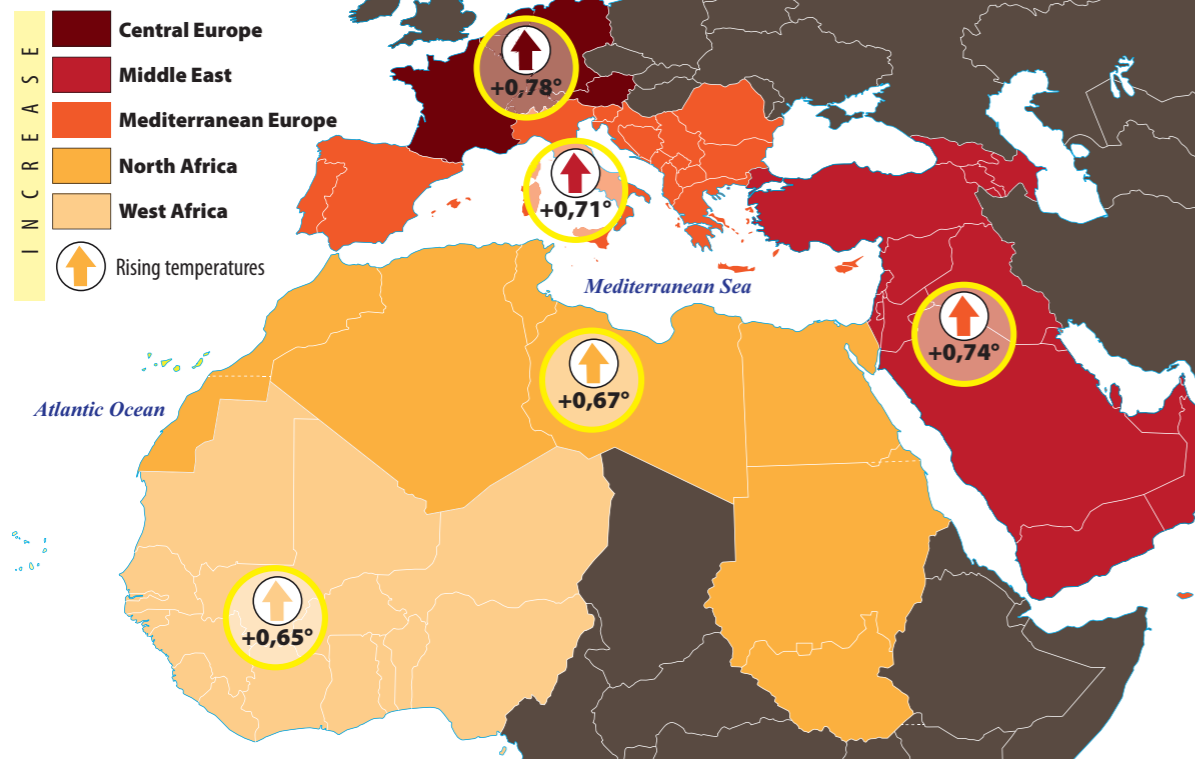
affect all the considered domain except West Africa. In particular, the Mediterranean Europe and the Middle East are expected to experience the strongest rainfall decrease (-7.1% equal to -57 mm and -7.4% corresponding to -18 mm, respectively) according to the worst scenario for the period 2041-2060. In contrast, the annual precipitation over West Africa is predicted to increase for about 1.5/2.4% (equal to a rainfall gain of ~10/16 mm) in the near future and the wetting tendency is confirmed when analysing the far future with a rainfall gain of ~ 4.5/5.7%. The general drying, as averaged across emission scenarios, is shown in **the drying maps in the following pages.**

The drying maps represent the rainfall anomaly for the Trans-Mediterranean sub-regions in the near-term future 2025 (representative of 2016-2035) and the medium-term future 2050 (representative of 2041-2060), in both cases with respect to 2005 (representative of 1996-2015). The anomaly is averaged across different emission scenarios.

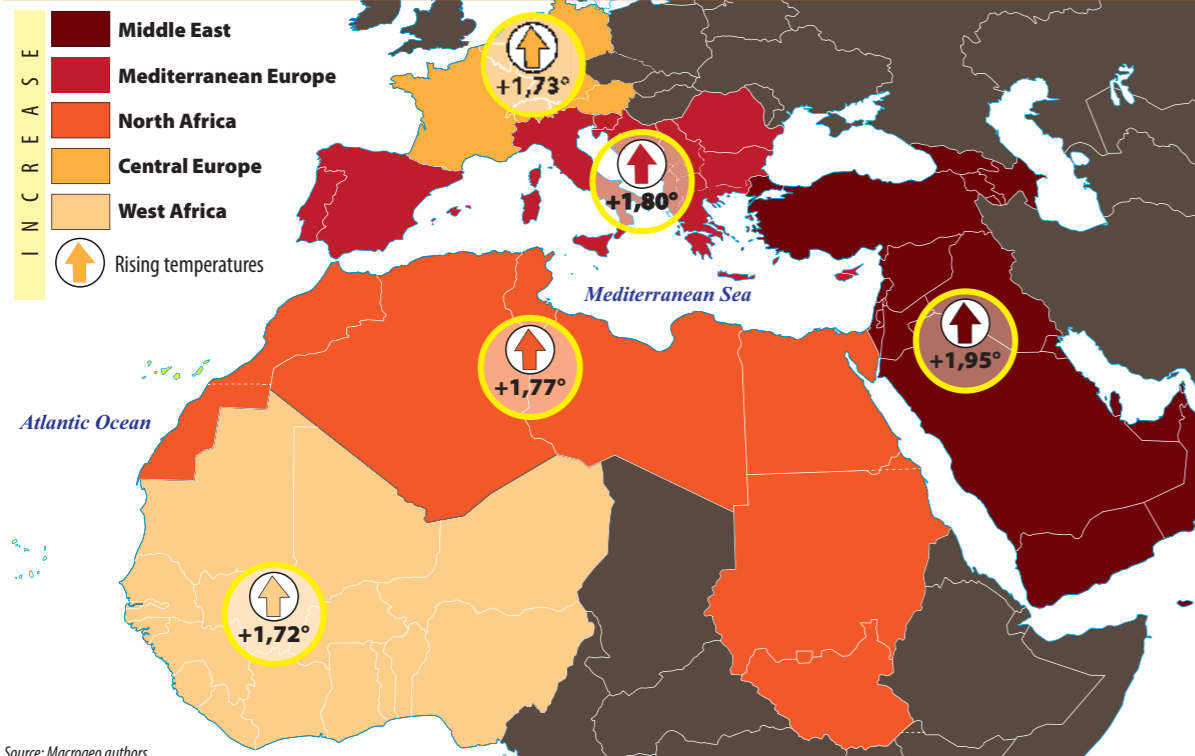
Moderate to severe drought episodes for 3-month periods are expected to increase in frequency across the Trans-Mediterranean region, with respect to the historical period, by two to almost five times, while for the globe the increase is lower and between two and three times. In particular Mediterranean Europe, followed by Central Europe and Middle East, will experience the strongest increase in drought frequency, around six/seven times more than the historical period. Results in case of long lasting drought (six months) reveal Mediterranean Europe and Middle East as the most affected regions, with frequency from two to four times higher than in the historical period.

Due to the general trends and variability in rainfall, the study region will face a general decrease of water availability. The Trans-Mediterranean region is expected to dry, from 2 to 7% in terms of drop in runoff generation. Such a land drying is more marked in the Mediterranean Europe, Middle East and North Africa with a mean decrease of about 16% in 2041-2060 (ranging from 14 to 19%), confirming

### THE WARMING (2005-2025)

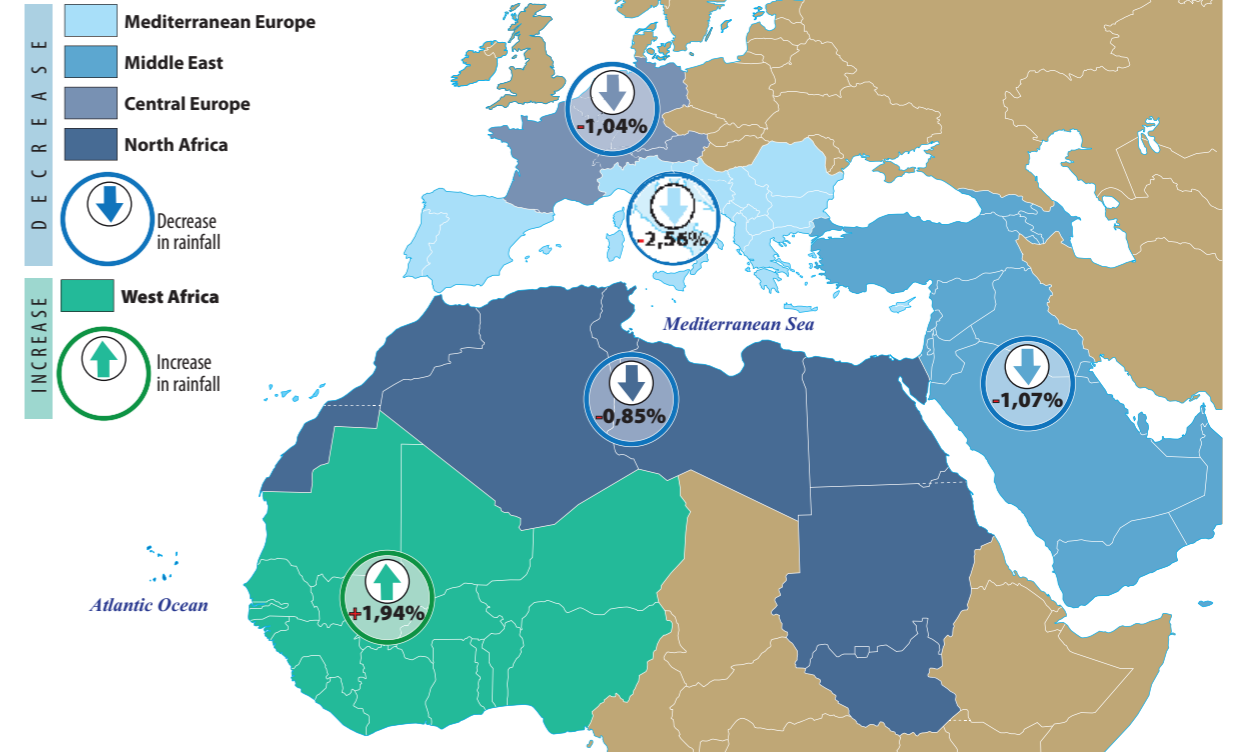


### THE WARMING (2005-2050)

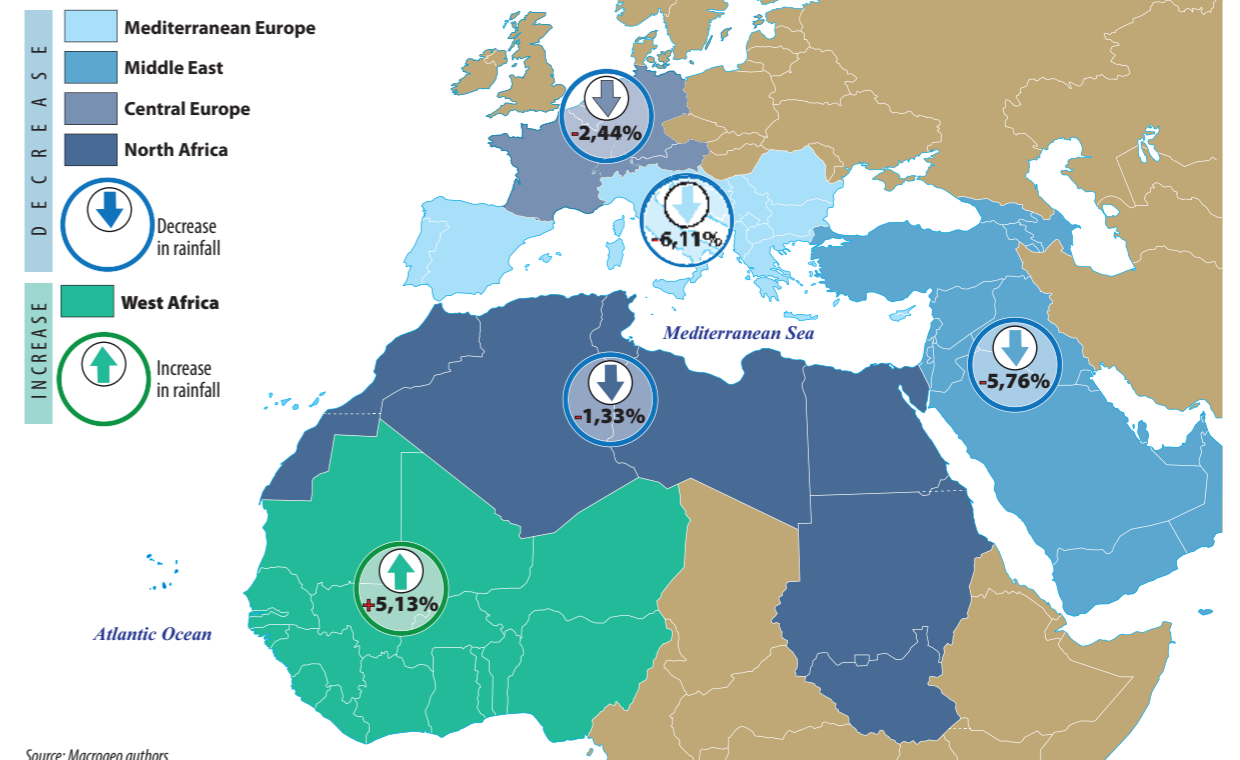


Source: Macroege authors

### THE DRYING (2005-2025)



### THE DRYING (2005-2050)



Source: Macroege authors

how increasing drops in rainfall lead to even more higher, not-linear, drops in runoff. The general land surface drying, as averaged across emission scenarios, is shown in *the drying maps*.

*The maps Change in water runoff in the next page* represent the runoff generation anomaly for the Trans-Mediterranean sub-regions in the near-term future 2025 (representative of 2016-2035) and the medium-term future 2050 (representative of 2041-2060), in both cases with respect to 2005 (representative of 1996-2015). The anomaly is averaged across different scenarios of emissions and of human impacts on water.

Concerning future agricultural production, at global level a yield increase is expected, likely associated to the dominance of technological development, for maize (~2/3% up to ~6/7% in the near and far future, respectively), no significant trends are found for both rice and soy, while a decrease is expected in wheat production, ranging from -1/-1.5% in the near future to -3/-5.5% in the far future either considering or not the use of irrigation.

In contrast to the global trends, the regional scenarios of maize yield show a clear decrease (from -1/-2% in the near future to -3/-8% in the far future). The strongest decrease is expected to occur in West Africa, one of the major player for maize production, regardless if using or not irrigation (yield drop reaches -10/-15% in the far future scenario). The other two main players for maize production, Central and Mediterranean Europe, suggest that losses of yield (up to -3% to -7%, respectively, in the worst far future scenario), can be avoided only if irrigation is applied, thus increasing competition over diminishing water resources.

In case of wheat, the near future scenarios suggest a small decrease both at global and regional level (no higher than 5% for the Trans-Mediterranean region) while the decrease gets stronger when considering the far future (13%) driven by losses in Africa (especially West, with drops up to 26%) and Middle East.

The rice yield is expected having no significant change in the near future, and a moderate decrease in the far future, while significant increases are expected in the far future if looking at sub-regional level: Central Europe and the Mediterranean should increase the yield for about more than 43% and 12%, respectively, under irrigation (the lesser yields in case of no irrigation have slightly lower increase), West Africa will experience the most pronounced decrease (up to 15%).

Soybean cultivation, key also for climate mitigation strategies due to the production of biofuels, seem experiencing pronounced decrease of yield in all the Trans-Mediterranean domain (up to -20% in the worst scenario for West Africa) while a significant increase is predicted for the Central Europe, higher when irrigating, and for Mediterranean Europe, but only in case of using irrigation. Again, this suggests the growing key role of water to maintain agricultural production.

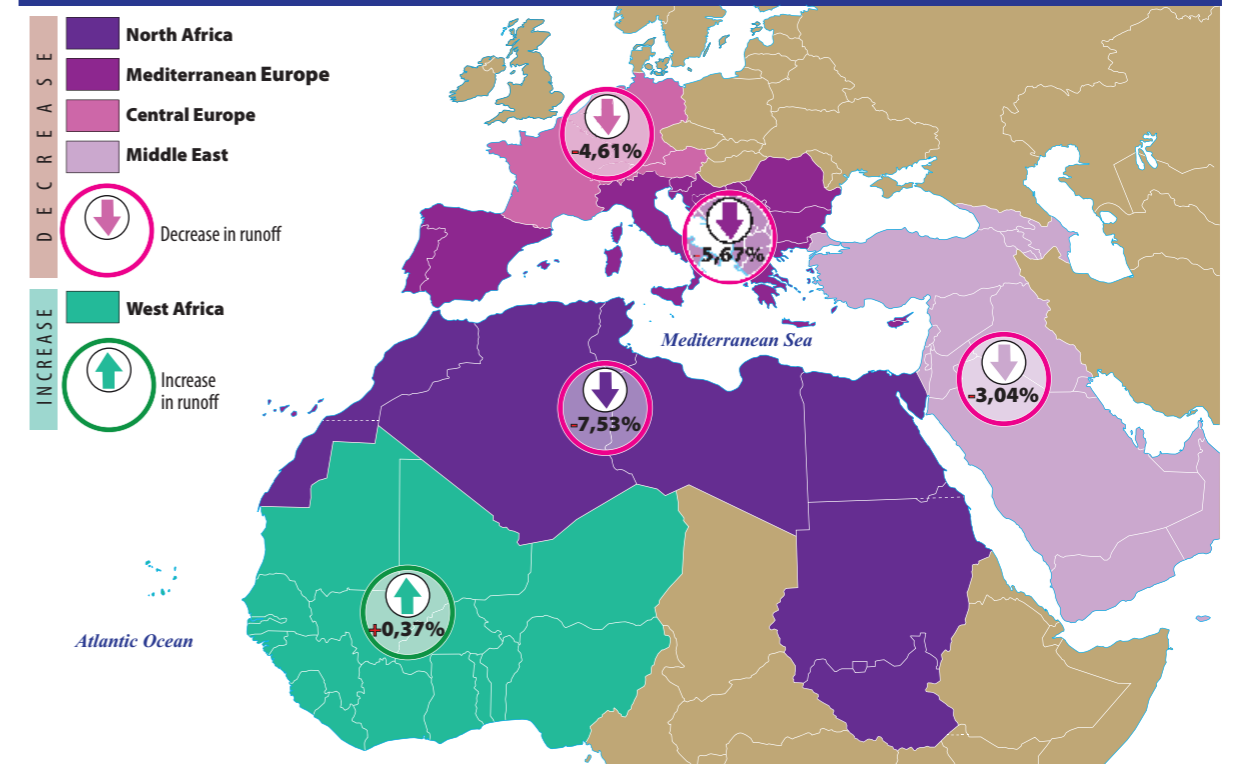
The changes in crop yields, as averaged across emission and irrigation scenarios, are shown in *the summary below*.

It represents the crop yield anomaly for the Trans-Mediterranean sub-regions in the near-term future 2025 (representative of 2016-2035) and the medium-

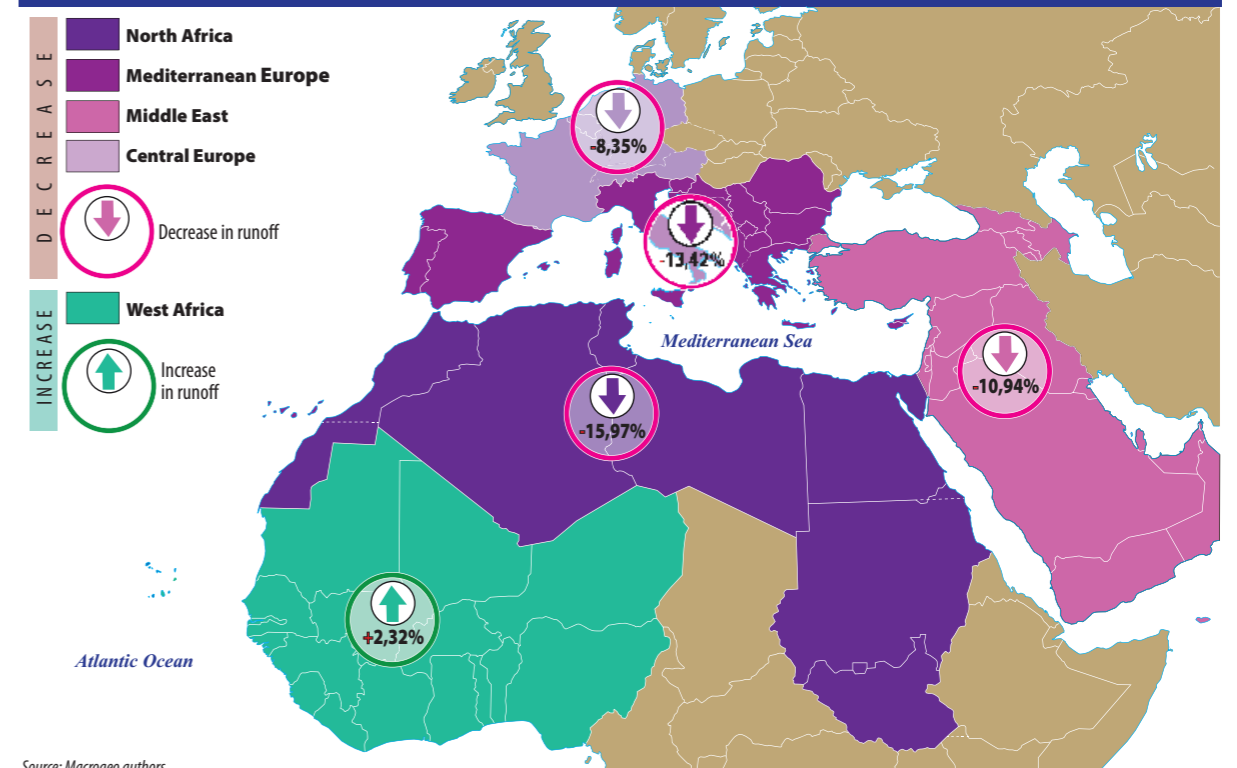
### SUMMARY AGRICULTURE

% CHANGE IN CROP YIELD vs. 2005	MAIZE		WHEAT		RICE		SOYBEAN	
	2025	2050	2025	2050	2025	2050	2025	2050
Central Europe	4,04	3,27	0,19	-3,21	18,16	35,97	10,82	13,82
Mediterranean Europe	-0,98	-2,60	-0,02	-2,87	6,52	9,91	0,57	-5,16
Middle East	-2,44	-5,12	-3,36	-10,82	-0,38	-4,17	-5,09	-6,54
North Africa	-2,97	-7,59	-6,58	-17,35	-1,42	-5,17	-3,85	-11,74
West Africa	-5,15	-12,43	-7,99	-22,06	-3,88	-11,77	-5,30	-13,83

### CHANGE IN WATER RUNOFF (2005-2025)



### CHANGE IN WATER RUNOFF (2005-2050)



Source: Macroege authors

term future 2050 (representative of 2041-2060), in both cases with respect to 2005 (representative of 1996-2015). The anomaly is averaged across different scenarios of emissions and of irrigation applications.

## Conclusions

Along the last six decades, in the Trans-Mediterranean region climate change and variability led to a warming of 1.4°C and to a rainfall reduction of 36 mm, while the decrease in surface water availability was up to four times higher than the decrease in rainfall. Extreme drought episodes also became more severe and recurrent, frequently matching with years of negative yield anomalies (up to -60%) for maize, wheat, rice and soybean.

For the future period, in the Trans-Mediterranean region climate change and variability can lead to a warming of ~0.7°C within the next couple of decades, which will more than double at the middle of the Century. Drop in runoff will be from 5 to 10 times stronger than drop in rainfall in function of the time horizon considered (short- or medium-term future, respectively). Drought episodes will become more frequent, at least doubling the historical occurrence. In case of both rainfed and irrigated agriculture, the yields for the key energy and protein crops considered are at strong risk due to the combination of new climate and water resources regimes, with the increase in irrigation needs posing additional challenges to the share of water resources among sectors and adjacent countries in the regions.

**Key messages are that it is not only the area of origin of Trans-Mediterranean migrations (African countries and Middle East) that will be increasingly affected by climate change hazards impacting water and food systems, but also European countries. This constitutes not only a risk but also an opportunity for food production, as the modified climate conditions**

**have the potential to increase suitability for new or currently minor cultivations in the north of the Mediterranean basin, while the southern side will lose productivity for all crops analysed if not adapting to climate change.**

## NOTES

<sup>1</sup> Exposure: The extent to which human society and its supporting sectors are stressed by the future changing climate conditions. Exposure captures the physical factors external to the system that contribute to vulnerability.

Sensitivity: The degree to which people and the sectors they depend upon are affected by climate related perturbations. The factors increasing sensitivity include the degree of dependency on sectors that are climate-sensitive and proportion of populations sensitive to climate hazard due to factors such as topography and demography.

Adaptive capacity: The ability of society and its supporting sectors to adjust to reduce potential damage and to respond to the negative consequences of climate events. Adaptive capacity indicators seek to capture a collection of means, readily deployable to deal with sector-specific climate change impacts.

<sup>2</sup> Economic Readiness: The investment capability that facilitates mobilizing capitals from private sector.

Governance Readiness: The stability of the society and institutional arrangements that contribute to the investment risks. In a stable country with high governance capacity investors are assured that the invested capitals could grow under the help of responsive public services and without significant interruption.

Social readiness: Social conditions that help society to make efficient and equitable use of investment and yield more benefit from the investment.

<sup>3</sup> Climate Research Unit; <https://crudata.uea.ac.uk/cru/data/hrg/>

<sup>4</sup> CLIMDEX – Datasets for Indices of Climate Extremes; <http://www.climdex.org/>

<sup>5</sup> Global SEI database; <http://spei.csic.es/database.html>

<sup>6</sup> ERA-Interim Reanalyses; <https://www.ecmwf.int/en/forecasts/datasets/reanalysis-datasets/era-interim>

<sup>7</sup> FAOSTAT – Food and Agriculture data; <http://www.fao.org/faostat/en/#home>

<sup>8</sup> Inter-sectoral Impact Model Intercomparison Project (ISI-MIP); <https://www.isimip.org/about/>

<sup>9</sup> RCP4.5 considers that radiative forcing is stabilised shortly after year 2100, consistent with a future with relatively ambitious emissions reductions. RCP8.5 is characterised by increasing greenhouse gas emissions that lead to high greenhouse gas concentrations over time.

# UNDERSTANDING AFRICA'S KEY CHALLENGES: NUTRITION, HEALTH AND HUMAN CAPITAL

*by Massimo Livi Bacci*

**Current trends show that Sub-Saharan Africa is trapped in a Malthusian vicious circle, where poverty nourishes hunger, malnutrition and high infant mortality which, coupled with high fertility, imply a high rate of growth that generates more poverty: Sub-Saharan Africa's food and demographic issues need to be tackled together, to break the circle.**

## The key role of food and nutrition

Considering our outline of the main characteristics of the demographic scenarios and of the main trends in climate change within the five major regions of our interest, it is clear that in the absence of appropriate

policies, an unchecked rate of population increase will imply a three-fold increase of the population before mid-century.

This will plunge this populous area into the negative spiral of a Malthusian trap:

FOOD → NUTRITION → DISEASES → SURVIVAL → REPRODUCTION → DEMOGRAPHIC GROWTH → FOOD

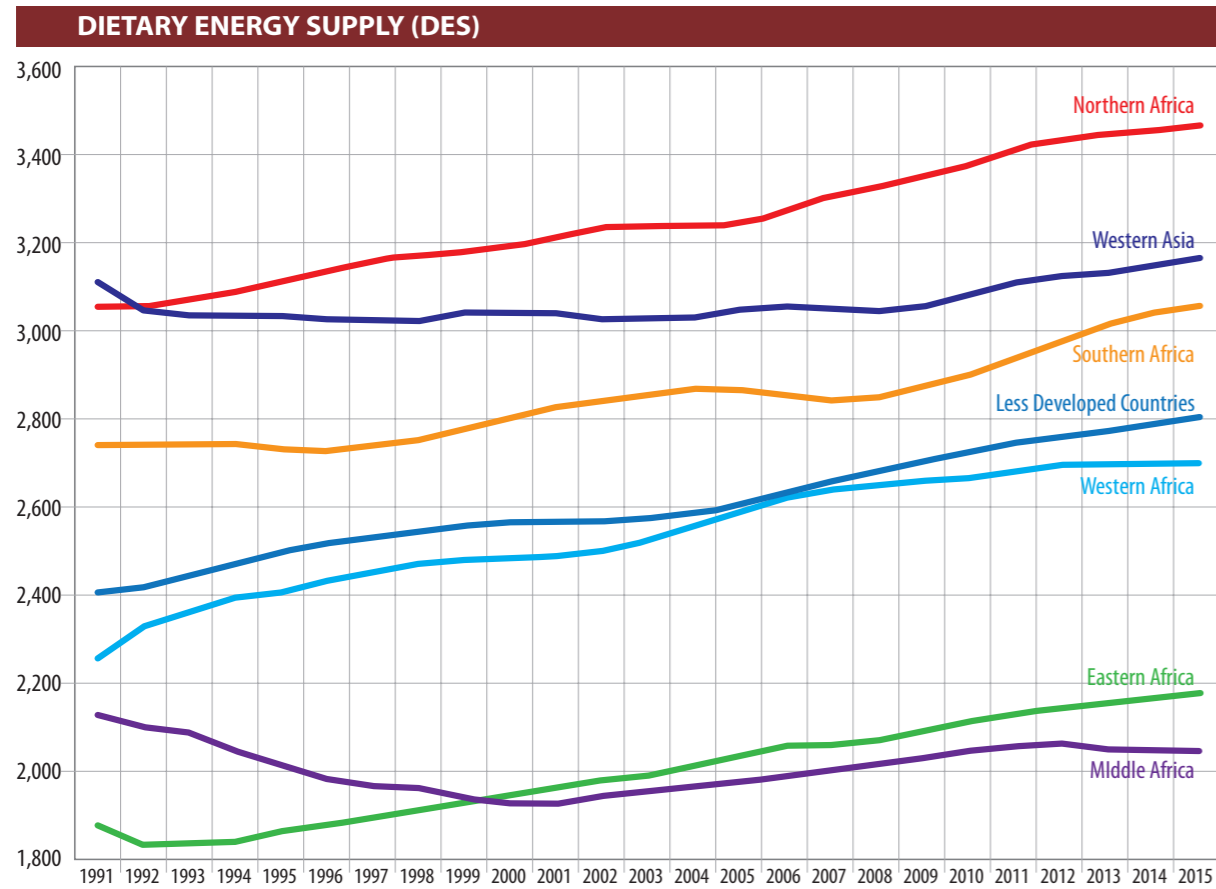
In this environment, *children are particularly vulnerable*; insufficient nutrition impedes the proper development of physical and cognitive capacities, has a negative effect on the learning capacities of the child, and ultimately impedes the formation of human capital, with negative consequences extending across individuals' entire lifespan. Inadequate nutrition, therefore, may produce another negative pattern that intersects with the one outlined above:

At the aggregate level – with all other factors held constant (education, investment in health, etc) - insufficient nutrition negatively affects productivity and economic development. Among the Sustainable Development Goals for the 2030 Agenda, Goal 2, “End Hunger”, envisages the “end of all forms of hunger and malnutrition by 2030, making sure that all people – especially children – have access to sufficient and nutritious food all year round”. This goal will be extremely difficult to achieve for Sub-Saharan

**INADEQUATE NUTRITION → RETARDATION OF PHYSICAL GROWTH → LACK OF ACCESS TO ADEQUATE EDUCATION → DIMINISHED PRODUCTIVITY → DIMINISHED EARNINGS AND INCOME**

Africa (SSA), where currently one out of four people goes hungry. The burden of disease is still extremely high, infant and child mortality (95 per thousand in 2010-15) is more than triple that of Western Asia

and two and half times that of Northern Africa; the incidence of transmissible diseases also remains very high. A rapid improvement of nutritional patterns is, therefore, a priority in order to achieve satisfactory



levels of health and survival, cornerstones of human capital and fundamental drivers of development. Coping with this challenge also requires investments and social policies to provide proper water sanitation and infectious disease control.

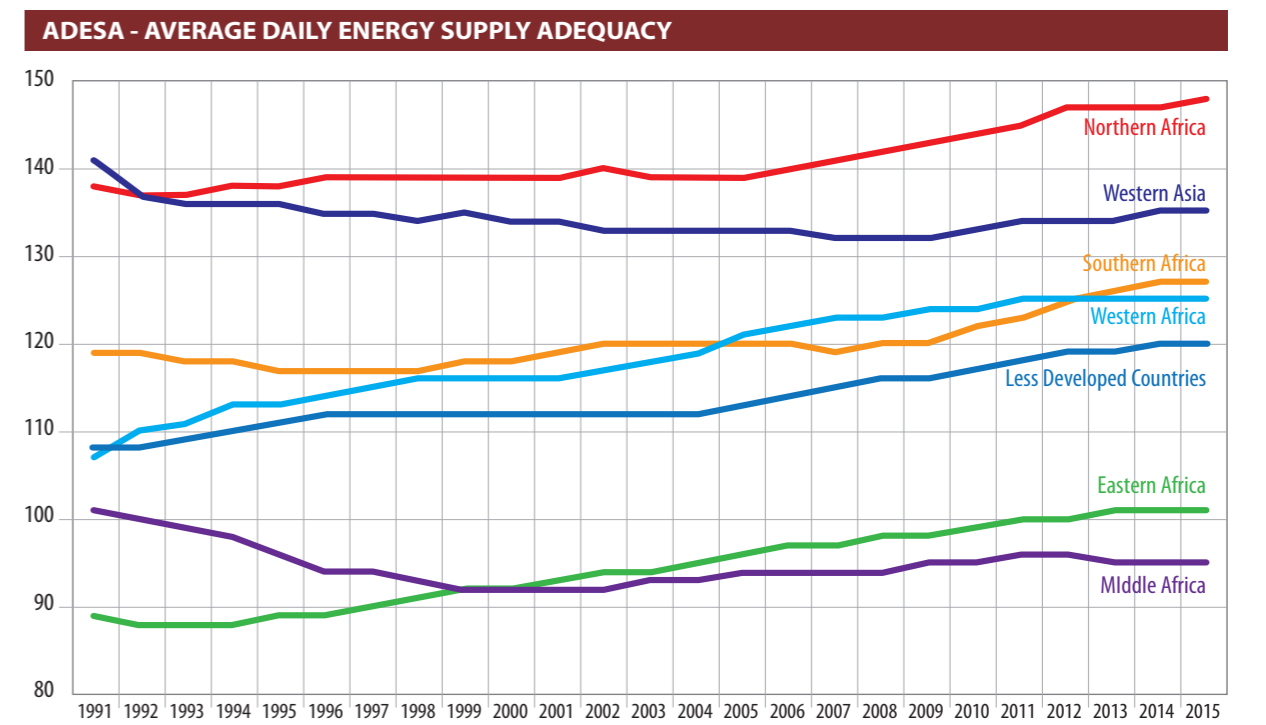
**Measuring nutrition to assess human capital**

According to 2017 estimates by intergovernmental organizations, global hunger now affects 815 million people (FAO, IFAD, UNICEF, WFP and WHO 2017). The last quarter of a century has brought an improvement in the nutritional conditions of developing countries, albeit with many exceptions. According to FAO estimates, in 1990-92, the *prevalence of undernourishment* (or in current parlance, people suffering hunger) in developing countries' populations was 23,3%; this proportion has been *(almost) halved to 12.9% in 2014-16*<sup>1</sup>. One of the Millennium Goals, perhaps the most significant one, has been achieved. However, *in SSA progress has been much less impressive*, and the same proportion, over the same time span,

has fallen from 33% to 23.3%. Moreover, because of the very rapid growth of the population, the total number of hungry people has increased by more than one fifth, from 176 to 218 million. In other words, the efforts (in terms of human and monetary resources) needed to reduce hunger in this part of the world need to be *much stronger than a quarter of a century ago*.

*DES (Dietary Energy Supply)* reports the values of the index for the different Sub-Saharan regions, and for a comparison, Northern Africa and Western Asia. The index measures the average calories available to each individual (of every age and gender) per day. Over the 1991-2015 period, the gap between Northern Africa, where the nutritional situation is relatively adequate, and SSA where malnutrition is rampant, has widened.

In 2014-16, DES in North-Africa was 43% higher than in the rest of the continent, and 68% higher than in Middle Africa, where DES has actually declined. The FAO has designed another measure called *ADESA (Average Dietary Energy Supply Adequacy)*



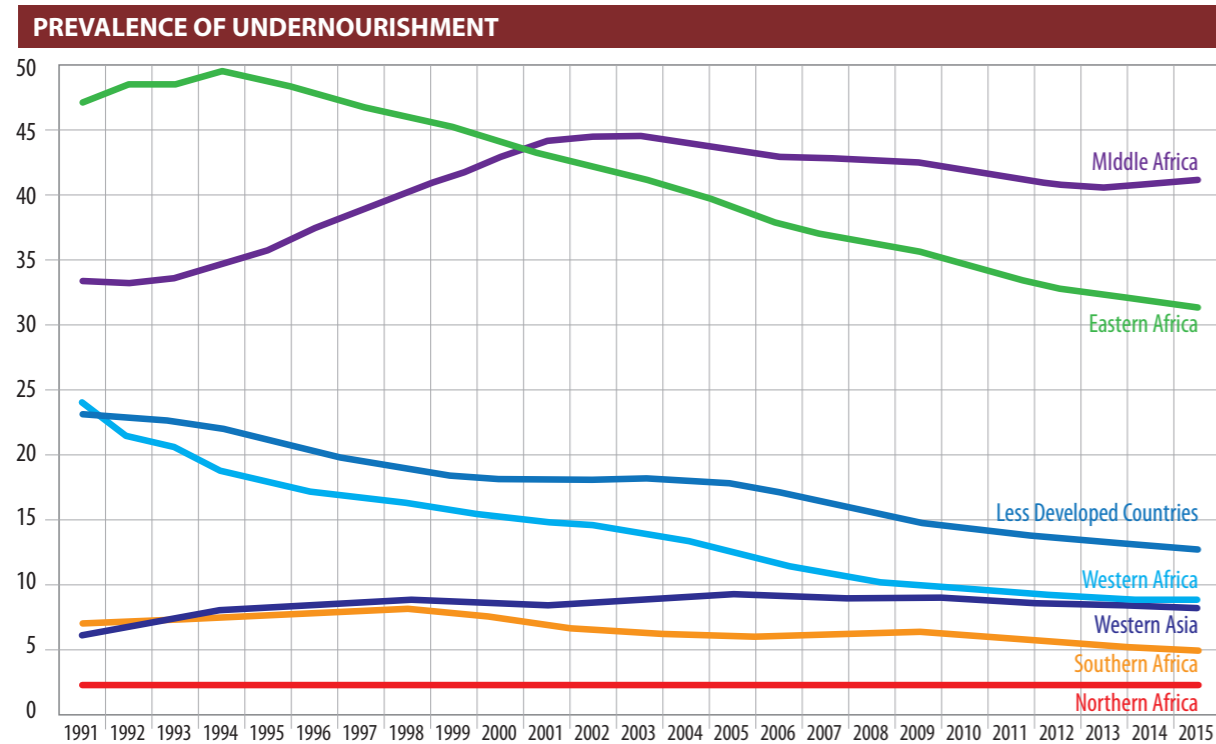
consisting of the ratio between the average caloric supply and the population's actual needs.

This measure provides a better insight into the nutritional situation of a country or a region. An index of around 100 would mean that food provision would be sufficient only in the case of perfect equality of access to food among its citizens. However, 100 is never enough, because this we need to take account of inequality. Therefore, an index of 100 would imply a very high proportion of people suffering hunger. Even countries with indexes of up to 115 are hit hard by the scourge of malnutrition. Over the period considered, the index has increased, in SSA, from 100 to 111, a small progress given the low starting point that compares with an increase of the same index, for the entire developing world, from 108 to 120. **It is worth noting the decline for Middle Africa (from 101 to 95) and the robust progress of Western Africa (from 107 to 125) which has almost reached the level of Southern Africa, the richest region of SSA.**

Two other indicators (see *Prevalence of undernourishment* below and *Depth of food deficit* next page) can provide a better insight into the nutritional status of the population. **The first one** reports the prevalence of undernourishment (defined by FAO as an estimate of the percentage of people in a population who are unable to get enough food to cover normal energy requirements; see also FAO 2017).

In the entire SSA region, almost one out of four individuals goes hungry, but while in Western and Southern Africa the incidence is below 10%, in Eastern Africa is above 30% and in Middle Africa above 40%. The **“Depth of Food Deficit” (DPD)** indicator measures the average number of calories needed in order to lift a deprived and undernourished individual above the hunger threshold and show us the scope of hunger.

Trends and differentials of the five Sub-Saharan regions depict a situation similar to that revealed by the other indicators; the average individual would



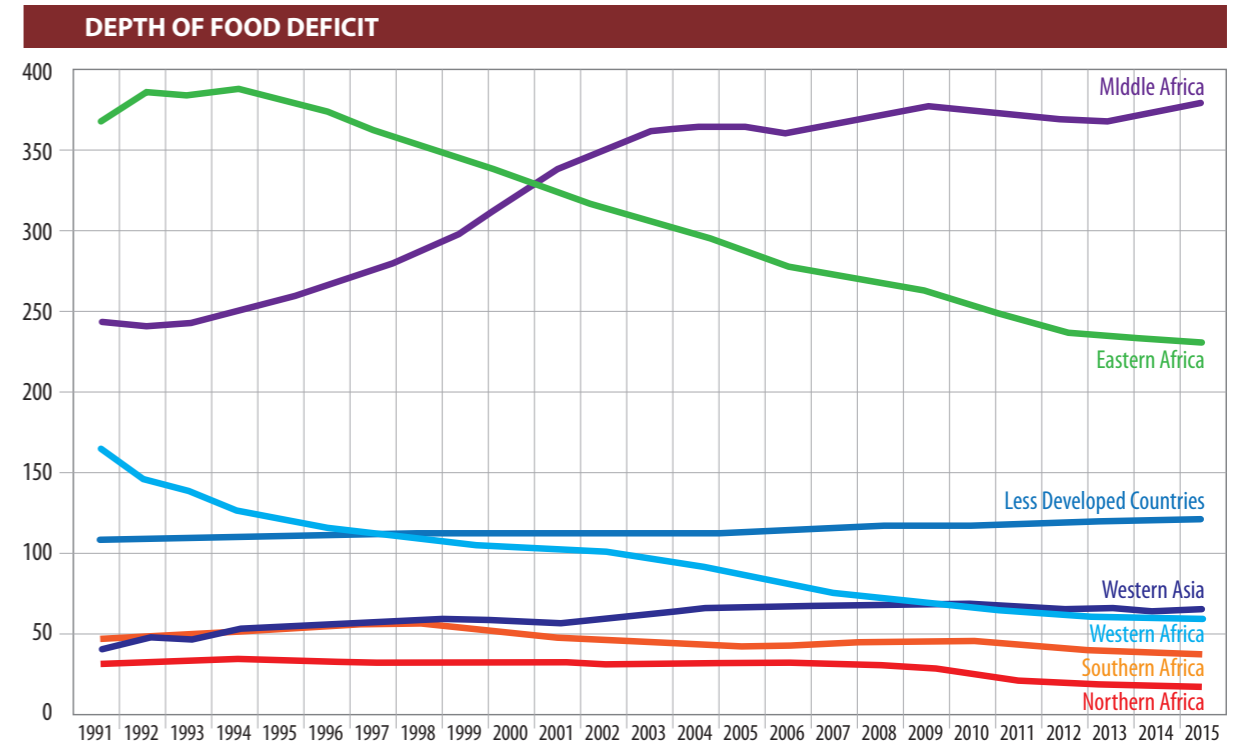
need a daily supplement of 175 calories for SSA, 230 in Eastern Africa, and 380 in Middle Africa. It should be noted that despite counting over two hundred million hungry people, most inhabitants of SSA are not dying of starvation. However, the presence of chronic hunger is not always apparent because the body compensates for an inadequate diet by slowing down physical activity and, in the case of children, growth.

### The geography of undernutrition

The causes of undernutrition are diverse but in most cases include limited quality or quantity of food, suboptimal feeding practices and high rates of infectious diseases. **Acute undernutrition (wasting) occurs as a consequence of short-term response to inadequate intake or to an infectious disease episode, and can be reversed if the child has access to adequate dietary intake in an environment which is free from infectious diseases.** Stunting results from insufficient intake of food over a long period of time and may be worsened

by recurrent infections. Wasting is a short-term health issue, but recurrent episodes of it may lead to stunting (Saka, Galaa 2016). “Reducing the prevalence of stunting among children, particularly 0-23 months, is important because linear growth deficit accrued early in life is associated with cognitive impairments, poor educational performance and decreased productivity among adults. Better nutrition leads to increased cognitive and physical abilities, thus improving individual productivity in general, including improved agricultural productivity”.<sup>2</sup>

The Demographic and Health Surveys (DHS) are an important source of information on nutrition in many developing countries, particularly in Africa. Over the last three decades, the DHS program has collected and analysed accurate and representative data on demography, health status, HIV and nutrition in 90 countries in over 300 surveys. The **table and maps in the next page<sup>3</sup> present the estimates of the percentage of children under 5 years of age who were wasted, stunted and underweight** in 14 countries of Africa according to the most recent survey



PERCENTAGE OF CHILDREN UNDER 5 YEARS OF AGE WASTED, STUNTED AND UNDERWEIGHT											
Country	Years of Surveys		Wasted			Stunted			Underweight		
	1st Survey	2nd Survey	1st Survey	2nd Survey	% variation	1st Survey	2nd Survey	% variation	1st Survey	2nd Survey	% variation
Egypt	2008	2014	7.9	9.5	3.4	30.7	22.3	-4.6	6.8	7	0.5
Sudan	2006	2014	14.5	16.3	1.6	38.3	38.2	0	27	33	2.8
Morocco	2003	2011	10.8	2.3	-9.8	23.1	14.9	-4.4	9.9	3.1	-8.6
Eritrea	2002	2010	14.9	15.3	0.3	43.7	50.3	1.9	34.5	38.8	1.6
Ethiopia	2005	2014	12.3	8.7	-3.3	50.7	40.4	-2.3	34.6	25.2	-3
Kenya	2009	2014	7	4	-8.6	35.2	26	-5.2	16.4	11	-6.6
South Sudan	2006	2010	24.6	22.7	-1.9	36.2	31.1	-3.5	32.5	27.6	-3.8
C African Republic	2006	2010	12.2	7.4	-9.8	45.1	40.7	-2.4	28	23.5	-4
Congo	2005	2011	8	5.9	-4.4	31.2	25	-3.3	11.8	11.8	0
D R of Congo	2007	2013	14	8.1	-7	45.8	42.6	-1.2	28.2	23.4	-2.8
Ghana	2008	2014	8.7	4.7	-7.7	28.6	18.8	-5.7	20.8	16.3	-3.6
Niger	2006	2012	12.4	18.7	8.5	54.8	43	-3.6	39.9	37.9	-0.8
Nigeria	2008	2014	14.4	7.9	-7.5	41	32.9	-3.3	26.7	19.8	-4.3
Senegal	2005	2014	8.7	5.7	-3.8	20.1	19.4	-0.4	14.5	12.8	-1.3
<b>Average (Underweighted)</b>	<b>2006</b>	<b>2013</b>	<b>12.2</b>	<b>9.8</b>	<b>-3.6</b>	<b>37.5</b>	<b>31.8</b>	<b>-2.7</b>	<b>23.7</b>	<b>20.8</b>	<b>-2.4</b>

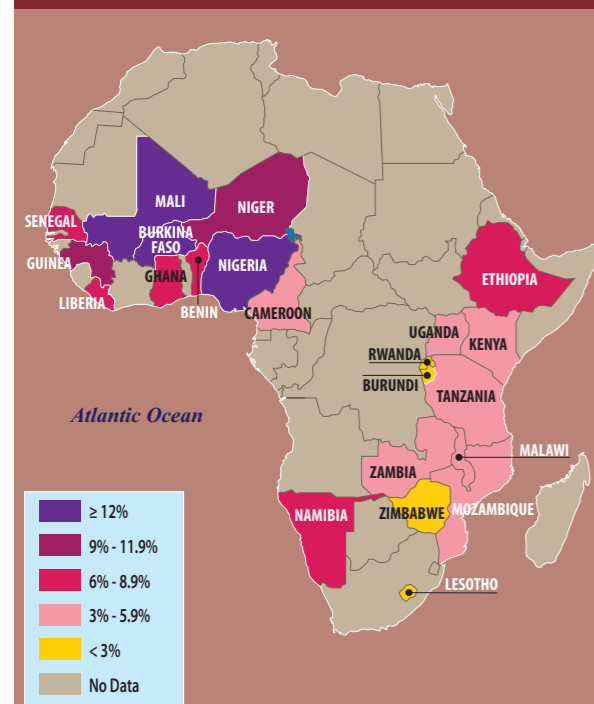
Note: Variation is "annual variation". The three indicators refer to % of children who were 2 standard deviations (-2SD) below WHO growth standards  
Source: DHS, <http://dhsprogram.com/data/>

(taken between 2010 and 2014), as well as in the preceding survey (taken between 2002 and 2009)<sup>4</sup>.

The prevalence of stunting has decreased globally, but in Africa progress (if any) has been slow, in spite of the relatively robust economic growth since the beginning of this century. Stunting has almost disappeared in developed countries and in many

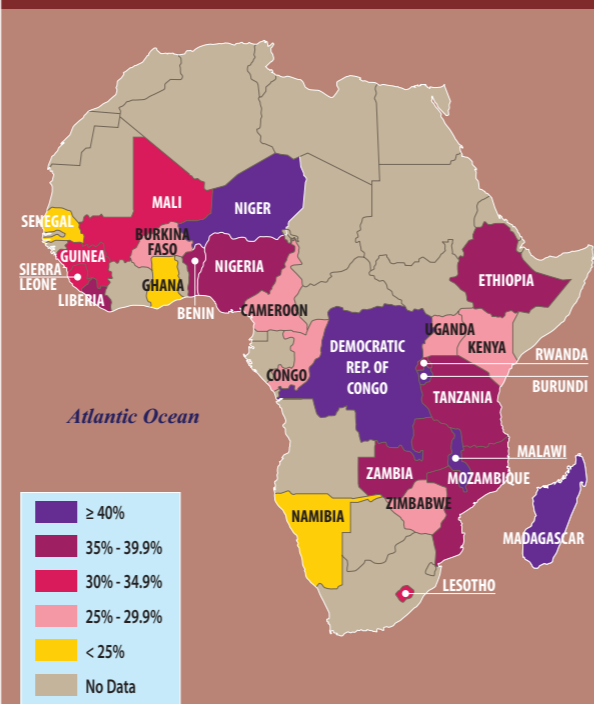
developing ones, but the un-weighted average for the 14 countries was 37.5% in the first of the two surveys considered and 31.8% in the second one, taken on average 6-7 years later. In Eritrea, 1 out of 2 children under five are stunted, in Ethiopia, Sudan, Central African Republic, D.R. of Congo, 4 out of 10; in South Sudan and Nigeria 1 out of 3. At the current rate, two or three decades would be needed in order

PERCENTAGE OF CHILDREN LESS THAN AGE 5 WHO ARE WASTED



Source: Demographic Health Survey program

PERCENTAGE OF CHILDREN LESS THAN AGE 5 WHO ARE STUNTED



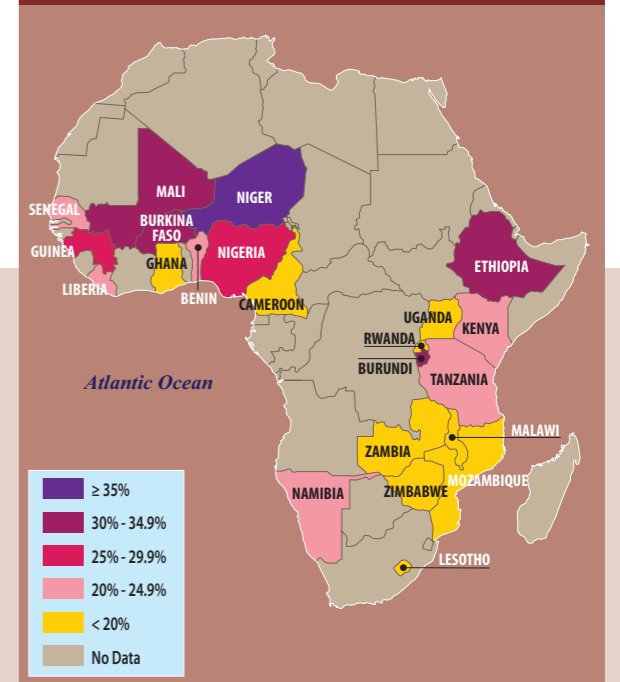
Source: Demographic Health Survey program

to reduce stunting from a mass phenomenon to a marginal one. Similar considerations can be made on the basis of the other two indicators: as for wasting, prevalence has increased from the first to the second survey in 4 out of the 14 countries; the prevalence of children underweight has increased in two cases and in one has remained unchanged.

### BOX: FOCUS ON NIGERIA

A further insight into the nutritional status in Sub-Saharan populations can be gained from the DHS Survey of Nigeria, its most populous state, carried out on a large sample of 40,000 households in 2013 (NPC and ICF International 2014). Anthropometric measures indicating stunting (height-for-age), wasting (weight-for-height) and underweight (weight-for-age) have been taken for children, according to sex, characteristics of birth (size, birth interval), feeding practices (lactation, supplementary food), background characteristics of the household (geographical residence, urban and rural residence, wealth of the household) and of the mother (education, nutritional status). The survey has also measured the micronutrients intakes of children and mothers. It is important to underline the fact that child and infant mortality (zero to five years of age) in Nigeria in 2010-15 was higher than in SSA (122

PERCENTAGE OF CHILDREN LESS THAN AGE 5 WHO ARE UNDERWEIGHT



Source: Demographic Health Survey program

against 95 per thousand), despite a per capita income that is higher than the regional average.

A synthesis of the results is reported in the table of the previous page. Stunting (height for age), including also "severe stunting", increases until the age of 24-35 months – reaching 46% of children (of which 27% are severely stunted) – with a

PERCENTAGE OF CHILDREN STUNTED, WASTED AND UNDERWEIGHT, NIGERIA, 2013						
Background features	Stunted		Wasted		Underweight	
	Severely	All	Severely	All	Severely	All
<b>24-35 months of age (peak)</b>	27.4	45.7	8.8	15.7	14.7	32.4
<b>Male</b>	22.6	38.6	9.3	18.9	12.4	38.2
<b>Female</b>	19.6	35	8	17.2	10.8	27.3
<b>Birth interval (&lt;24 months)</b>	24.6	41.4	8.5	17.8	13.6	31.8
<b>Birth interval (&gt;48 months)</b>	17.6	31.8	9.1	18.7	10.9	26.5
<b>Urban residence</b>	13	26	8.4	17.5	13.3	32.3
<b>Rural residence</b>	25.9	43.2	8.8	18.3	13.3	32.3
<b>Mother's education: None</b>	31.1	49.7	22.7	5	17.3	39.7
<b>Mother's education: Secondary and +</b>	6.4	13.3	11	4	3.6	10
<b>Wealth Quintile: lowest</b>	33.8	53.8	10.5	21.9	17.3	41.9
<b>Wealth Quintile: highest</b>	7.9	18	5.9	13.9	5.4	15.6
<b>Total</b>	<b>21.1</b>	<b>36.8</b>	<b>8.7</b>	<b>18</b>	<b>11.6</b>	<b>28.7</b>

Source: Nigeria, Demographic and Health Survey 2103, pp. 178-78



slight decline after that age (37% at age 48-59 months). The proportion of children which does not receive, after the age of 6 months, the necessary complementary foods beside being breastfed is too high; only 10% of children aged 6 to 24 months are fed appropriately based on recommended infant and young child feeding practices. Lack of appropriate complementary feeding may lead to undernutrition and frequent illness. Stunting is higher in male children (39%) than in female children (35%). “Stunting is higher among children with a preceding birth interval of less than 24 months (41%) than among children who were first births and children with a preceding birth interval of 24-47 months or 48 months or more”. In other words, high fertility (women with short intervals between successive births) is associated with high frequency of stunting among their children. In Nigeria, as elsewhere in SSA, there is a high frequency (47.6%) of mothers who are underweight (with a BMI, Body Mass Index, below 18.5) and a high frequency of mothers who are “overweight or obese” (BMI above 25).

Moreover, mothers’ nutritional status has an impact on the level of stunting in their children: children whose mothers are underweight have the highest levels of stunting (48%), while those whose mothers are overweight or obese have the lowest levels (25%). “Children in rural areas are more likely to be stunted (43%) than those in urban areas (26%), and the pattern is similar for severe stunting (26% in rural areas and 13% in urban areas)”. The level of education of mothers shows an inverse association with stunting in their children, ranging from a low of 13% among children whose mothers have higher educational attainment to 50% among those whose mothers have no education at all. “A similar inverse relationship is observed between household wealth and stunting. Children in the poorest households are three times as likely to be stunted (54%) as children in the wealthiest households (18%)”<sup>5</sup>. The survey also revealed that a significant proportion of children suffered micronutrient deficiencies (vitamin A and iron) in their diets, an important factor in child morbidity and mortality.

### Breaking the vicious circle: the 175 calories goal

Both macro and micro data reported in this section show that *nutrition continues to be a major problem in SSA*. Progress in the last decades has been slow and in some countries absent; the proportion of the population that suffers hunger has declined slowly, and the number of hungry people has increased because of the unchecked growth of the population. In order to lift these over 200 million people from their status of deprivation, 175 calories per/day and per/capita would be needed. Undernutrition, stunting and wasting are rampant among children, and the high fertility rate exacerbates the situation. Among mothers, obesity coexists with excessive thinness.

It is key to emphasize that Sub Saharan Africa has an unresolved food problem and an unresolved

demographic problem. Undernutrition with its negative consequences on health, physical growth, and cognitive abilities, undermines the formation of human capital, slows individual productivity and makes balanced development more difficult to achieve.

#### NOTES

<sup>1</sup> These data, as well those at the base of Figures 1, 2, 3 and 4, are taken from FAO Food Security Indicators <http://www.fao.org/economic/ess/ess-fs/ess-fadata/en/#.Wg3LGRP9TL8>

<sup>2</sup> <https://usaidlearninglab.org/sites/default/files/resource/files/Nutrition%20Indicator%20Reference%20Sheets.s2.pdf>

<sup>3</sup> Kamanori, Pullum 2013.

<sup>4</sup> These are anthropometric measures: stunting is height-for age; wasting is weight for height, underweight is weight-for-age.

<sup>5</sup> This and the two previous quotes are taken from NPC and IFC International 2014, p. 177.

# UNEVEN GROWTH AND RESOURCE SEIZING IN AFRICA'S MIGRATION HUBS

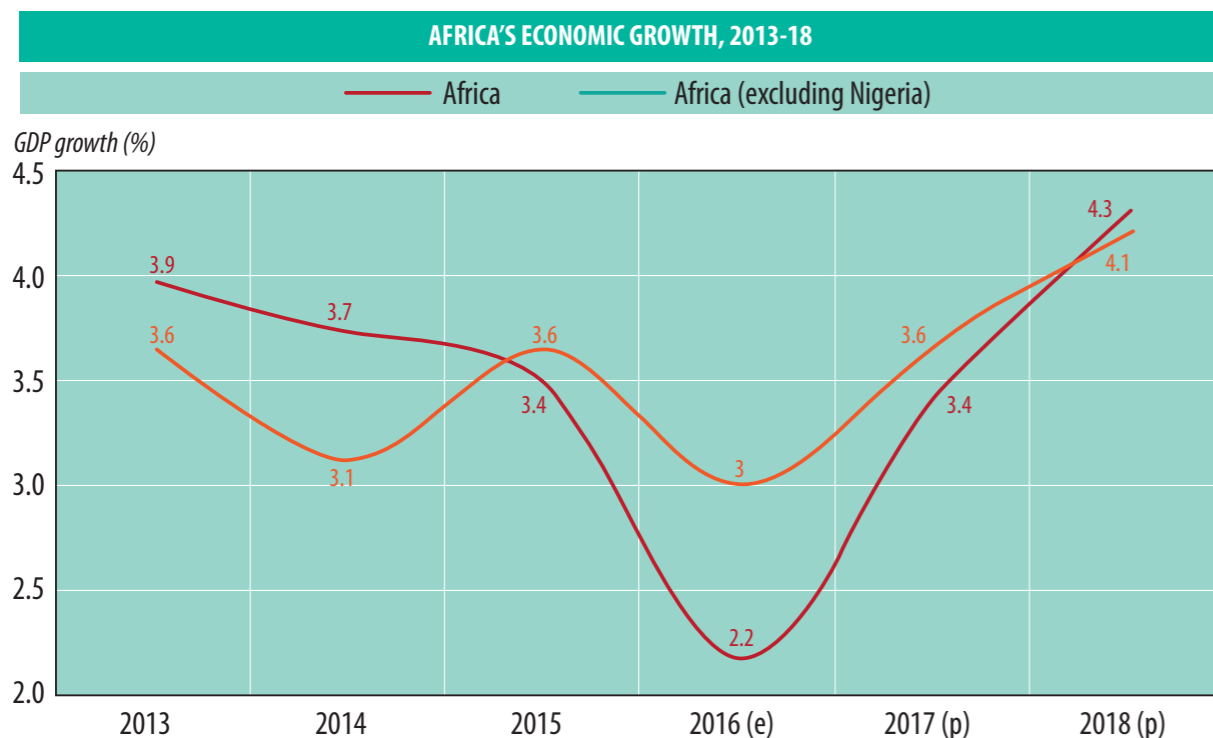
by Fabrizio Maronta

*A geopolitical and geoeconomic analysis of Africa's main migration hubs shows that the continent still faces a challenging outlook. Phenomena of resource seizing (both water and land) affect public services, agriculture and development.*

A geopolitical and geoeconomic analysis of Africa's main migration hubs shows that the continent still faces a challenging outlook. Phenomena of resource seizing (both water and land) affect public services, agriculture and development. Remittances remain a key economic nexus between countries of origin and destination of migration.

### Africa's challenging economic outlook

Future trends in demography and climate need to be considered in the broader African geoeconomic outlook, to have a proper understanding of future trends in the main countries of origin of migration.



Source: Adapted from AfDB Statistics Department data  
Statlink  <http://dx.doi.org/10.1787/888933474872>

**The fall in commodity prices throughout 2016 has tested the “Africa rising” narrative.** Africa’s growth slowed to 2.2% in 2016, down from 3.4% in 2015. This fall underscores the importance of a few big economies for Africa’s overall growth. Nigeria carries the largest weight, accounting for 29.3% of Africa’s GDP, followed by South Africa with 19.1%. The recession experienced in those two countries therefore had a bigger impact on Africa’s GDP than the recessions elsewhere. In particular, Nigeria’s economic woes increased migration pressure, the country being one of Africa’s big demographic hubs.

While the slowdown has concentrated mainly in commodity exporters, several other factors played a role, including continued effects from the “Arab Spring” and adverse climate factors (bad weather and drought). Continued slow growth in China is taking its toll on Africa: China is now a major trade partner in several African countries, accounting for 27% of Africa’s exports and 83% of its commodities exports.

**Regional differences are stark.** East Africa leads in terms of economic growth, with an estimated 5.3% in 2016. North Africa comes second at 3%, buoyed by recovery in Egypt and Algeria, while persistent political uncertainties and reduced oil production in Libya continue to weigh heavily on the region. Southern Africa recorded the third-best performance, with growth of 1.1%, while Central and West Africa saw the worst performance: 0.8% and 0.4% respectively. Central Africa was affected by the poor performance of Equatorial Guinea, D.R. of Congo and Chad. West Africa, on the other hand, was dragged down by Nigeria, which experienced a contraction of -1.5% in 2016 from 2.8% growth in 2015.

### Poverty and fragility throughout Africa

In this uneven and challenging context, high unemployment remains a problem, particularly

in middle-income African countries, reaching up to 50% in some of them. While low-income countries report very low rates of unemployment, the statistics are misleading, masking high levels of underemployment, particularly large informal sectors with low wages and high uncertainty. The informal sector accounts for up to 80% of Africa’s labour force.

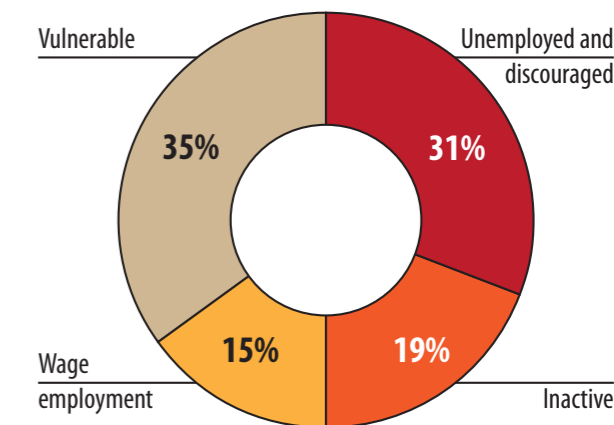
Crucially, Africa’s impressive economic growth over the last 15 years has not generated much employment, as it has been concentrated in capital-intensive areas, like the extractive sector, or primary products which do not require much labour. With rapid population growth, this represents a major problem: without diversified, productivity-driven and broad-based growth, Africa will continue to create fewer jobs than needed, given its demographic trends.

No wonder then, lack of jobs affects primarily young people. Despite their improved education, young Africans still suffer from both poor health and a lack of employable skills, as well as limited access to financial assets to start their own businesses. As a result, they suffer disproportionately from high unemployment.

**Given current demographic trends, the youth employment challenge will only become more critical. Across Africa, youth are three times more likely to be unemployed than adults. Half of all youth are either unemployed or inactive, while 35% are in vulnerable jobs. Gender inequality makes it worse for women.**

This situation contributes to Africa’s income inequality, one of the highest in the world. The average Gini coefficient is 0.43, compared to 0.39 for other developing regions. This is of major concern because high inequality lowers the poverty-reducing power of growth, since the benefits accrue to a smaller proportion of the population. At present, half of Africa’s income goes to just 10% of the population. In 2010, 6 of the world’s 10 fastest

### YOUTH EMPLOYMENT STATUS IN AFRICA, 2015



Source: AfDB (2016c)

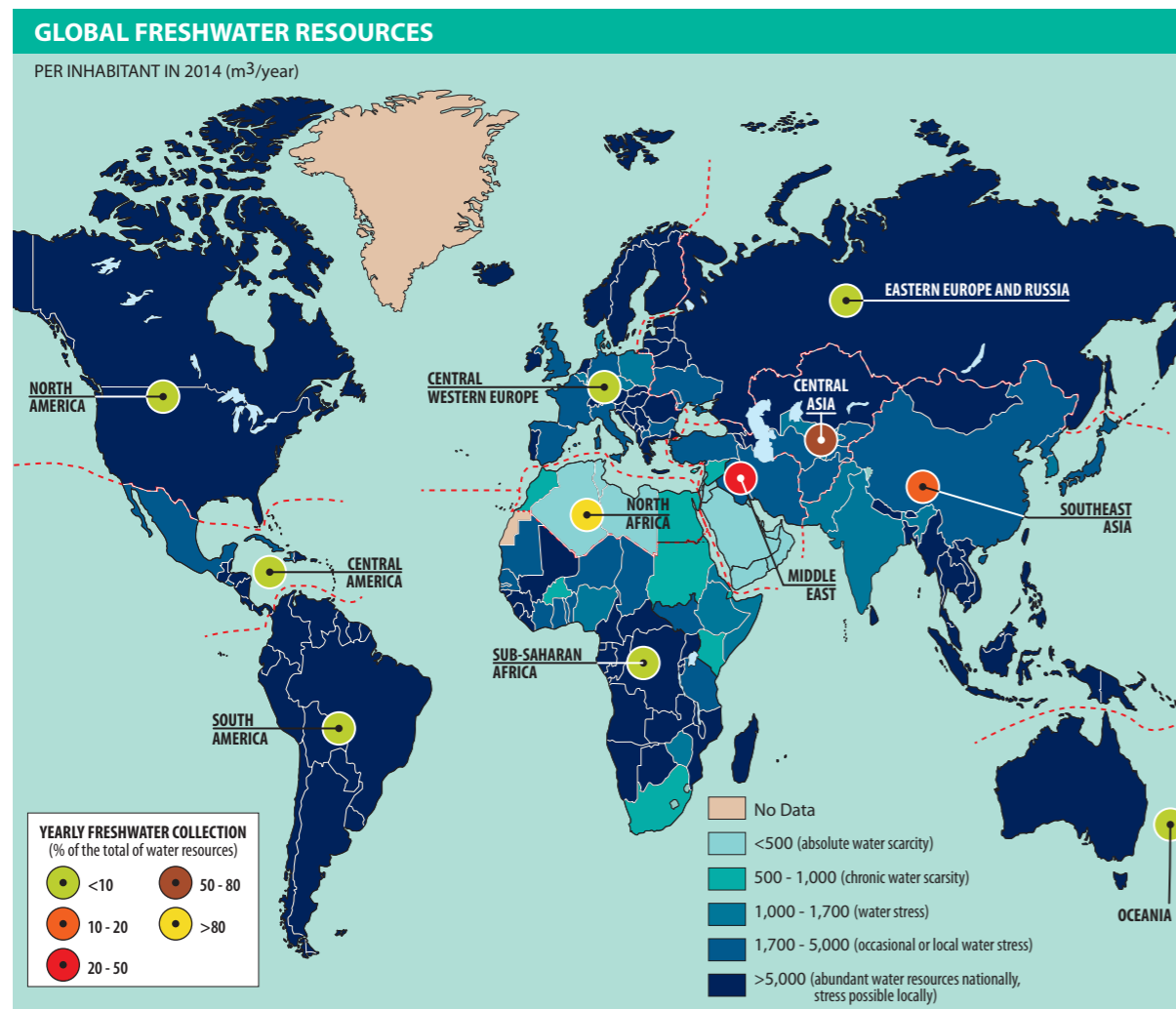
growing economies were in Africa. Yet in 2011, 6 of the 10 most unequal countries were also in Africa.

Poverty and inequality often combine with natural fragility and political instability in creating a strong push for emigration. The number of Africans affected by conflict is high. Africa accounts for 11 of the 20 countries with the highest likelihood of conflict. In 2015, out of the 65.3 million people forced to flee their homes because of violence and persecution, 37% lived in the Middle East and North Africa, and a further 27% were south of the Sahara. In Africa, the most affected countries were Sudan (3.5 million people displaced), Nigeria (2.2 million), South Sudan (2.1 million) and the DRC (1.9 million).

Africa also saw an increase in numbers affected by natural hazards, particularly drought and flooding – 7.6 million in 2014. That figure rose to 23.5 million in 2015, almost half of which (more than 10 million) were in Ethiopia.<sup>1</sup>

### The geopolitics of water

In the context of environmental fragilities caused by climate change and its related phenomena, one of the key issues linked to food availability in Africa



Source: FAO AQUASTAT database - 2015 - Atlante Geografico De Agostini 2015

(as elsewhere) is of course, water. In fact, among the many challenges the continent faces a major one is the ability for Africans to access clean and adequate water supplies, both for human consumption and irrigation/livestock feeding. Both aspects are relevant but the latter is crucial in the context of this report.

It is worth remembering a well-known, but often overlooked fact – that **agricultural and livestock production combined consume more fresh water than any other activity**. According to FAO Aquastat (2017), agriculture accounts on a global average for 70 % of total water withdrawals. The water needed to produce crops and livestock

also varies significantly, ranging from 197 litres / kg of sugar crops to 15415 litres /kg of bovine meat (Water footprint network 2017).

Livestock directly uses only 1.3% of the total water used in agriculture. However, when the water required for forage and grain production is included, water requirements for livestock production dramatically increase (WWF 2014).

Overall, Africa has about 9% of the world's fresh water and 11% of the population, but there is significant unevenness in terms of water availability (GRAIN 2012). Moreover, infrastructure is still poor, even in key economic sectors like agriculture,

on which most Africans depend. African agriculture remains mostly based on rainfed farming, and well below 10% of cultivated land is irrigated (GRAIN 2012; Lewis 2013).

*The region most affected by water-related challenges in Africa is Sub-Saharan Africa.* According to the WHO, in 2006 only 16% of people in the area had access to water through a household tap (WHO 2008), and the situation does not look much better today (WHO 2015). Even when water was available, there were risks of contamination due to several factors: among them, poor maintenance of wells and water sanitation facilities (when they exist) due to limited financial resources and lack of proper water quality testing. Once water is provided, its quantity is often given more attention than its quality.

*By 2030, 75 to 250 million Africans (mostly in the Sub-Saharan region) may be living in areas of high water stress, and this would likely displace anywhere between 24 million and 700 million people. Surface water sources are often highly polluted, and infrastructure to pipe water from fresh, clean sources to arid areas is expensive (GRAIN 2012; WHO 2015).*

Groundwater, although not immune from overexploitation and pollution, has a somewhat better outlook. In fact, it is naturally protected from contamination (unless heavy metals or bacteria coming from leaking sewage infect it) and its availability is less affected by droughts, at least in the short term.

However, limits to tapping induced by the high costs of drilling represent an obstacle. This leads international institutions dealing with the issue to distinguish between “physical” and “economic” water scarcity: the first being the absolute lack of water, the second referring to its inaccessibility due to the financial and technological challenges posed by the effort.

The lack of clean water (and consequent access to adequate sanitation) has widespread implications. Young children die from dehydration (because of diarrheal illnesses) and malnutrition. Diseases such as cholera are rampant during the wet season. Women and young girls, who play a key role in carrying water, are prevented from doing income-generating work or attending school. They are also at risk of violence since they travel such great distances from their villages on a daily basis.

In urban areas meanwhile, especially in Sub-Saharan Africa, the rapid growth of cities has led to large volumes of water being extracted from existing sources, resulting in their depletion. Moreover, the development of wastewater management systems has not kept pace, leading to pollution of natural water bodies and crops irrigated with them, irregular water supply, and threats to aquatic life.

### Land acquisitions and water seizing

No less important to Africa's water issue are external factors, namely the land and water acquisition activities (two sides of the same coin) carried out by foreign actors for farming/agricultural ends or as a form of commodity speculation. Here we refer mainly, though not exclusively, to the forms of land acquisition termed by the Tirana Declaration as “international”, i.e. “large-scale land grabbing [...] which we define as acquisitions or concessions that are one or more of the following: (i) in violation of human rights, particularly the equal rights of women; (ii) not based on free, prior and informed consent of the affected land-users; (iii) not based on a thorough assessment, or are in disregard of social, economic and environmental impacts, including the way they are gendered; (iv) not based on transparent contracts that specify clear and binding commitments about activities, employment and benefits sharing, and; (v) not based on effective democratic planning, independent oversight and meaningful participation.” (International Land Coalition 2011).

## THE NIGER



Source: Atlante Geografico De Agostini 2015 and authors' elaboration

In recent years, foreign companies from the Gulf, India, China and elsewhere — including Europe — have been acquiring millions of hectares of lands in Africa. A country like Saudi Arabia does not lack land for food production. What's missing is water. The same can be said for the Indian sub-continent — depleted by decades of unsustainable irrigation — or for China, where water scarcity, soil erosion and pollution affect food production and water availability.

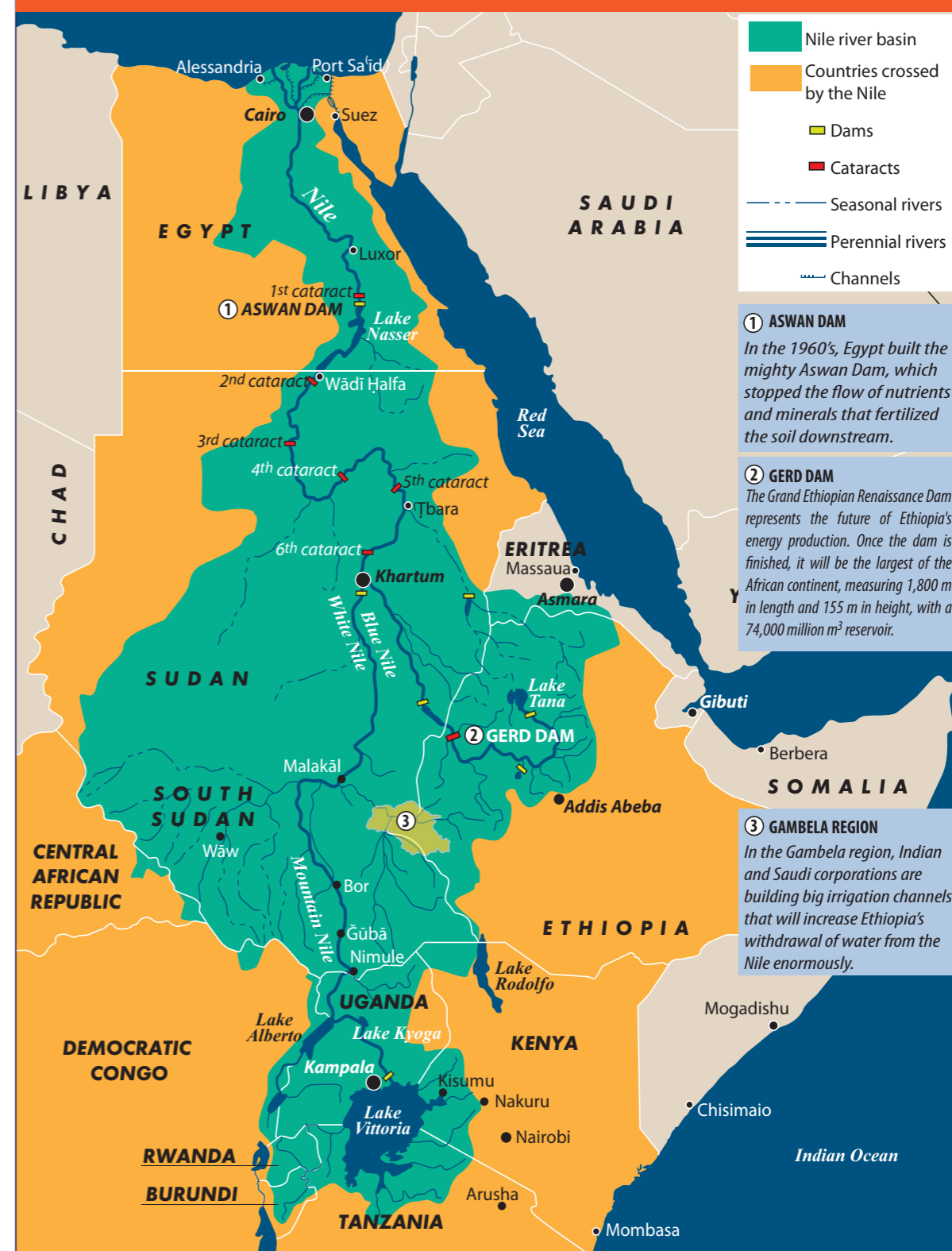
*Thus, when looking at land acquisition in Africa — or in Latin America, for that matter — one has to consider that the value is not so much (or only) in the land as it is in the water*

*it hosts. All of the land deals in Africa involve large-scale, industrial agriculture operations which consume massive amounts of water. Nearly all of them are located in major river basins with access to irrigation, in fertile and fragile wetlands, or in more arid areas that can draw water from major rivers. In some cases, the farms directly access ground water through pumping systems.*

Two examples which illustrate this perverse dynamic are the Niger and Nile rivers.

The former is West Africa's largest river and the third longest on the continent. Millions rely on

## THE NILE



Source: Atlante Geografico De Agostini 2015 and authors' elaboration

its basin for agriculture, fishing, trade and as a primary water source for hydropower provision by public infrastructures. Mali, Niger and Nigeria are the most dependent on the river, but several other countries share its waters. The river has suffered under the strain of dams, irrigation and pollution. Water experts estimate that its volume has shrunk by one third during the last three decades. Others warn it might lose another third due to climate change, in particular due to increased variability of inflow that will make reliability of inter-annual water availability more uncertain and fluctuating, affecting large scale irrigation projects in terms of effective irrigable surface.

In Mali, the river spreads out into a vast inland delta, which constitutes Mali's main agricultural zone and one of the region's most important wetlands. Here the *Office du Niger* presides over the irrigation of tens of thousands of hectares, mainly for rice production, using a substantial part of the Niger's water, especially during the dry season. In the 1990s, FAO estimated Mali's potential to irrigate from the Niger at slightly over 500,000 hectares. Now, due to increased water scarcity, independent experts put that capacity at just 250,000 hectares. Yet the Malian government has signed away over half a million hectares to foreign companies from North Africa, China, the UK and Saudi Arabia (among others). Independent studies calculate that over 70% of the floodplains of the inner Niger delta could be lost, with a dramatic impact on Mali's ability to feed its people (GRAIN 2007).

Africa's longest river, the Nile, is a lifeline for Egypt, Ethiopia, South Sudan, Sudan and Uganda and is a source of significant geopolitical tensions since 1959, when a colonial deal brokered by Great Britain allocated three quarters of the average annual flow to Egypt and just a quarter to Sudan. Massive irrigation schemes were built in both countries to grow cotton for export. In the 1960s, Egypt built the enormous Aswan dam, which stopped the flow of nutrients and minerals which fertilized the soil downstream.

In Sudan, the Gulf States financed a further increase of irrigation infrastructure in the 1960-70s in an effort to turn Sudan into the breadbasket of the Arab world. This was unsuccessful and half of Sudan's irrigation infrastructure currently lies abandoned or underused. In the past few years the conflict over the Nile water has received significant attention after the decision by Ethiopia to build a large dam (the Grand Ethiopian Renaissance Dam) to produce electricity to be also exported to neighbouring countries. The dam, currently under construction, raised serious concerns regarding its effect on water shares of downstream countries (e.g. Egypt and Sudan).

Both Sudan and Egypt produce most of their food from irrigated agriculture, but both face serious problems with soil degradation, salinization, waterlogging and pollution induced by the irrigation schemes. As a result, the Nile barely delivers water to the Mediterranean any longer, undermining agricultural production in its once fertile delta.

In recent years, this fragile basin has been the target of a new wave of large-scale agriculture projects. Ethiopia, South Sudan and Sudan have leased out millions of hectares in need of irrigation. Ethiopia is the source of some 80% of the Nile's water. In its Gambela region (bordering South Sudan), Indian and Saudi corporations are building large irrigation channels that will increase Ethiopia's withdrawal of water from the Nile enormously. In South Sudan and Sudan, an area greater in size than the Netherlands has been leased out to foreign corporations. To the north, Egypt is also leasing out land and implementing its own new irrigation projects. It is difficult to imagine how the Nile can handle this.

As previously mentioned, Europe is not foreign to land acquisition. On the contrary, it is well into it. If the major current international investors are the Gulf States and China, EU States have increased demand for land acquisition. In particular, six European countries are among the biggest investors

in terms of outwards Foreign Direct Investment stock in agriculture: Italy, Norway, Germany, Denmark, the United Kingdom, and France (FIAN 2011, for further explanation see also Antonelli et al. 2015).

European involvement in land acquisitions is first due to the activity of both the EU and individual member States, whose policies directly and indirectly stimulate economic sectors that increase demand for land. The main of those is by far agrofuels. A relatively recent case in point is Italian ENI, which in 2009 undertook a multi-billion dollar land acquisition project in the Republic of the Congo to develop, amongst other things, oil palm for biodiesel (Oil Watch Africa 2009).

EU Directive 2009/28EC (April 2009) has set a mandatory target for member States: a minimum 10% share of renewable energies (including agrofuels) by 2020. Under this directive, each State has been obligated to adopt a national renewable energy action plan establishing national targets for renewable energy consumed in transport, electricity, heating and cooling. Since production costs are not in line with those of fossil fuels, the EU market for agrofuels depends largely on incentives. Several media outlets and NGOs have highlighted the relationship between the EU directives, State

policies and the increasing land acquisitions by European companies for agrofuels production. (GRAIN 2007).

In this frame, European development cooperation is actively supporting the introduction of agrofuel policies in African countries, such as Mozambique and others (Ecoenergy 2008), while European banks are also involved in promoting agrofuel production in Africa, in the form of financial support to private (and in some cases, public-private) endeavours<sup>2</sup>.

Another factor to be taken into account is the effect of the financial crisis, since recently the finance sector has been turning towards land as a source of solid returns. From 2008 on, an army of investment houses, private equity and hedge funds – many of them European – have been acquiring farmlands throughout the world and especially in Africa (GRAIN 2008), in countries like Mozambique, South Africa, Botswana, Zambia, Angola, Swaziland and the D.R. of Congo.

#### NOTES

<sup>1</sup> See UNDP (2015).

<sup>2</sup> "Aktion: Kein Zuckerrohr für deutsche Autos!", *Rettet den Regenwald*, 15/4/2015.



# ROUTES OF TRANS-MEDITERRANEAN MIGRATION

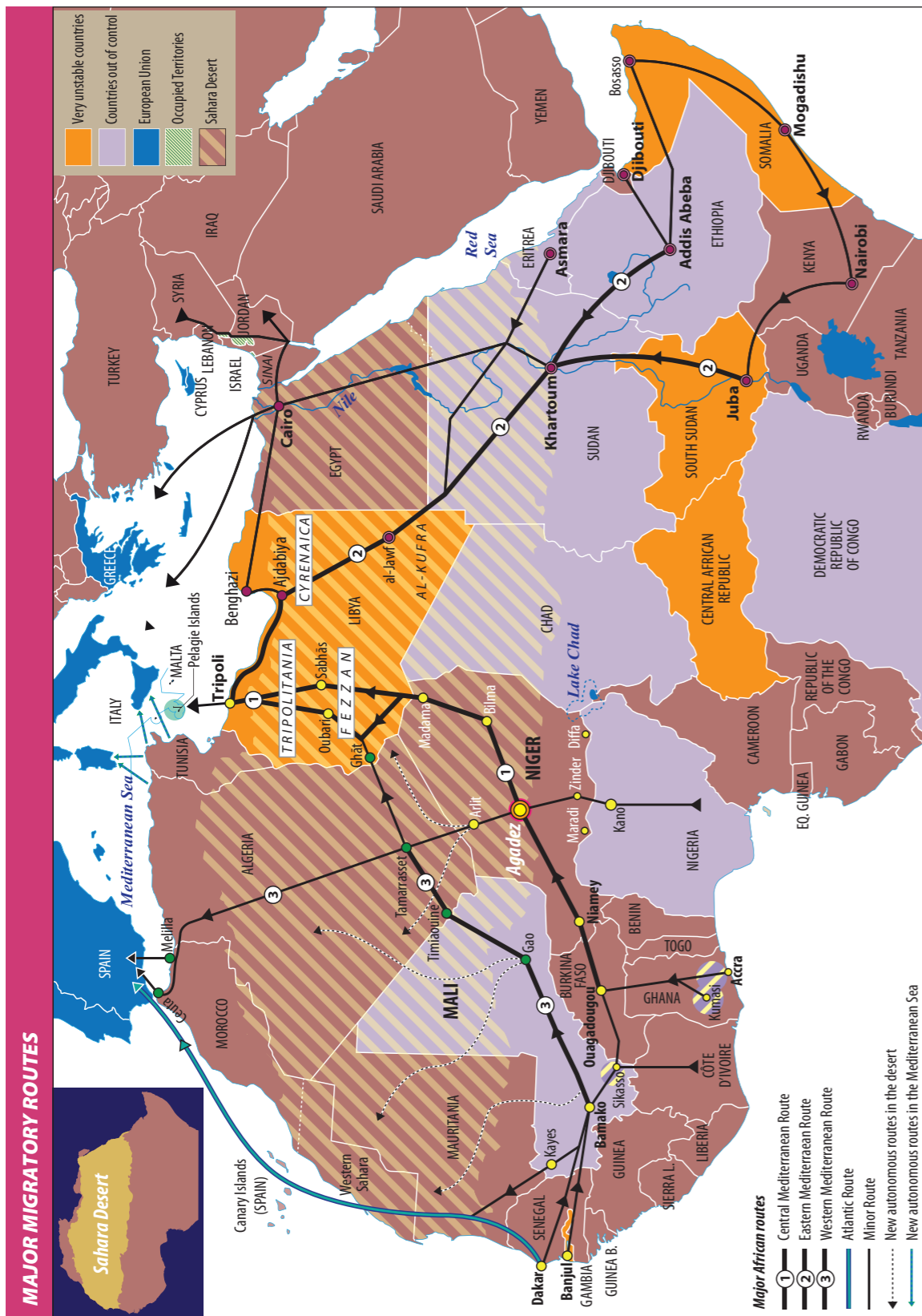
*by Luca Raineri*

*The main migratory routes across the Mediterranean and towards Europe are the Atlantic route, the Central Mediterranean Route, The Eastern Mediterranean Route and the Balkan Route. The infrastructure of migration often uses, as in Agadez, previous routes built for smuggling foodstuffs and labourers, and it fosters a thriving criminal economy. Migratory flows tend to react quite quickly and adapt to political and economic shifts occurring in the countries of origin, transit and destination, therefore they need to be constantly analysed.*

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transit and destination, therefore they need to be constantly analysed.

Throughout the years, several different routes of migratory flows across the Mediterranean and towards Europe have been carved out. Their popularity, and the magnitude of the flows in transit, have changed depending on shifting social and political circumstances. Their scope and scale, however,



increased significantly in the last couple of decades, and most notably since 2011 as a result of the collapse of authoritarian regimes in the MENA (Middle-East and North Africa) region during the Arab Spring. Long-lasting humanitarian crises, including in the Sahel, the Horn of Africa, the Middle-East and Central Asia, have combined with the economic downturn of raw-materials export-based economies across the world, and pushed an increasing number of individuals to look for better life opportunities abroad.

This section sketches the changing dynamics of *the most important migratory routes leading to Europe across the Mediterranean*, and the following section will present case-studies on links between agricultural production and migration networks.

### The Atlantic Route

In the early 2000s, the prominent role of Spain as one of the main entry points of migrants – most notably from West Africa – to Europe contributed to consolidating the so-called West Mediterranean and the Atlantic routes. Migrants accessed Spain through the enclaves of Ceuta and Melilla, or most frequently by boat from Morocco. Following the entry into force of more stringent regulations against irregular migration from and across Morocco in 2003, a new route was progressively developed, leading to Spain from Senegal and Mauritania via the Canary Islands. The popularity of the Atlantic route peaked in 2006, when approximately 32,000 migrants landed in Spain's Canary Islands. This was also due to the crisis of the local fishing industry, one of the most labour-intensive in Senegal. Opaque fisheries exploitation deals passed between Senegal and foreign countries contributed to depleting natural stocks and the ruin of local fishermen. The latter thus had little choice but to turn into either migrants or smugglers. Since 2007, however, the entry into force of bilateral agreements between Spain, on the one hand, and Senegal and Mauritania, on the other, contributed

to considerably reducing these flows. In 2016, 10,631 attempts of illegal border crossing were detected between Spain and Morocco, while entries via the Atlantic route were just 671. However, the popularity of this route is soaring again in 2017.<sup>1</sup>

### The Central Mediterranean Route

The Central Mediterranean Route (CMR) connects the south of Italy to North Africa, and Libya most notably. However, its branches draw deeply into sub-Saharan Africa. The flow of African migrants reaching Italy had always been modest, but it started to increase in the early 2000s, in correspondence with the growing restrictions along the Western Mediterranean route through Morocco, and then boomed in 2008. That year, an unprecedented 31,000 migrants arrived in Italy, out of which 23,000 were from Africa, including approximately 6,000 Nigerians, 5,000 Somalis, and 3,000 Eritreans. The following year, the entry into force of the “Treaty of Friendship and Cooperation” between Italy and Libya contributed to reducing this flow by more than half, but the collapse of the Ghaddafi regime in 2011 and the failure of the state-building process in 2014 prompted another upsurge, whose scale was again without precedent. Arrivals by sea in Italy soared substantially in the subsequent years, from about 43,000 in 2013, to 170,000 in 2014, 153,000 in 2015, and 181,000 in 2016.<sup>2</sup> Throughout the same period, a remarkable number of approximately 93,000 Eritreans, 66,000 Nigerians and 27,000 Gambians reached Italy, thereby suggesting that the CMR had branched out towards both West Africa and the Horn. Flows tend to converge in the Nigerien city of Agadez, where migrants in transit have increased from estimated at 40-60,000 in the early 2010s, to more than 250,000 in 2016.

The quantity and diversity of the migrants along the CMR makes it almost impossible to determine the average profile of those setting off for Libya. Young males largely prevail - thus, generally it is less the starving and poorest, but rather the dissatisfied

low-middle class (De Haas 2010). Push factors are also varied: in places like Eritrea and Gambia, the presence of authoritarian regimes and systematic human rights abuses has certainly played a major role. In Somalia, migration is linked to state collapse and widespread insecurity. In Nigeria, migratory flows towards Europe do not originate from the north-eastern areas affected by Boko Haram, but from the relatively richer and safer Edo State, thereby suggesting the impact of the recent economic crisis. Yet limited migratory flows originate from other countries in the region facing similar challenges, and show the relevance of cultural factors and path-dependencies.

The boom of migration towards Libya and Italy has triggered the development of a veritable “business of migration”. In spite of the over-simplified image often suggested by media and policy discourses, in fact, human smuggling is a composite enterprise nested in local political economies, not necessarily violent, and enjoys a fundamental impunity which relies on well-oiled corruptive schemes. From West Africa, prospective migrants reach Agadez by public transport. In many cases, bus companies belong to businessmen sponsoring the local political leaders, who are happy to turn a blind-eye to the patterns of irregular mobility in exchange for a share of the profits. From East Africa, on the contrary, better structured cartels organise the smuggling of migrants from their countries of origin to the Mediterranean shores, generally across south-east Libya and most notably through the city of Kufra. Across the Sahel security forces are often seen to cooperate with the smugglers, and exert a systematic protection racket by extorting an informal “fee” to ensure safe passage. The flow of migrants has made transit cities, like Agadez, also destinations for migrants, who are attracted by the (informal) job opportunities set in motion by the thriving industry of migration. Through local eyes, then, the latter is seen more as a source of development and stability than as a destabilising criminal threat. *From Agadez, migrants cross into Libya thanks to*

*the infrastructure developed in the 20th century for the smuggling of foodstuffs from the north, and of agricultural labourers from the south.*

One finds a different situation in Libya, where enforcement is subcontracted to different militias, many of which have vested interests in the business of migration while enjoying complete impunity. Tebu ethnic networks, which were marginalised under Ghaddafi, have managed to control the most significant routes in south Libya, and cooperate across political divides with smuggling networks and militias intersecting in the launching ports of north-west Libya. The profits of smuggling thus contribute to perpetuating centrifugal forces which hinder the process of state-building. This context represents a breeding ground for the emergence of widespread patterns of abuses, including labour and sexual exploitation, kidnapping-for-ransom, and sales of organs. However, in spite of alarmistic media reports, there is no real evidence of the involvement of jihadist insurgent groups, such as Al-Qaeda and the Islamic State, in the organization of human smuggling to and across Libya.

Across migratory routes, local governments fail to enforce harsh repressive measures against human smuggling also because the remittances of migrants abroad often contribute significantly to local livelihoods and development. In Nigeria, for instance, remittances of the diaspora are estimated to exceed USD 20 billion per year, and in Senegal they represent the first source of foreign currency in the country (Devillard et al. 2015).

**The Eastern Mediterranean Route and the Balkan Route**

Networks of all sorts devoted to the smuggling of both legal and illegal commodities have existed for decades cutting across the short maritime border that separates Greek Islands from the Turkish mainland. Following the deterioration of the security situation in Syria, the skyrocketing demand for transit

provided a unique opportunity to dramatically boost the business of smuggling. The flow of Syrians, however, did not prompt the creation of a brand new route, but added to the migrant flows from Iraq, Afghanistan, Iran and Pakistan which have been constant here throughout the last decade, featuring approximately a total amount of 40-50,000 crossings per year between 2008 and 2014.<sup>3</sup>

In 2015, these figures rose dramatically, when the increasing restrictions along other migratory corridors, via Egypt and Libya most notably, forced Syrian migrants and asylum-seekers to look for alternative routes. Facing limited restrictions in Turkey, and a relatively easy journey across the Aegean, the Eastern Mediterranean route featured prominently among them. Hundreds of thousands of Syrian migrants then headed to Turkey’s eastern ports of Bodrum, Izmir, Cesme, Dikili, and Ayvalik, from where they managed to be shipped for a relatively cheap price and reduced risk to the outer Greek Islands such as Kos, Samos, Chios and Lesbos. An unprecedented amount exceeding 857,000 undocumented migrants was detected along this route in 2015, 56% of which were Syrians, 24% Afghans, and 10% Iraqis. In Greece, those fleeing war-torn countries were indiscriminately granted transit permits, which gave them the opportunity to continue their journey towards their intended destinations and file their demands for international protection in central and northern Europe. Migrants could then move relatively unhindered via public transport to Greece’s mainland, and from there to the heart of Europe. The largest share of this flow, i.e. more than 550,000 migrants, thus continued overland across the Balkans, including through Bulgaria, Macedonia (Former Yugoslav Republic of), and Serbia, before splitting into two branches accessing the EU respectively in Hungary and in Croatia. Fearing the effects on local public opinion, south-eastern European countries’ governments did their best to smooth this flow and make sure that migrants could reach their intended destinations, such as Germany or Sweden, as expeditiously as possible.

Since 2016, however, the political, social and economic challenges stirred by the management of this flow have prompted the reaction of European authorities. Restrictive measures at national, European and international level were adopted to constrain the flow across this route, including the EU-Turkey deal in March 2016, and the implementation of limited entry-quota in Hungary in July 2016. While the legal status of these provisions remains controversial, they succeeded in considerably reducing migration figures across the Eastern Mediterranean and the Balkan routes. As compared to 2015, flows shrank by about 80% in Greece, where approximately 177,000 undocumented migrants arrived in 2016, 87% of which came from three countries: Syria (about 80,000), Afghanistan (about 40,000) and Iraq (about 25,000). Figures are even more striking in the subsequent legs of the journey: flows have reportedly reduced by more than 95% in Hungary and Croatia, leading to the substantial draining of the Balkan route.

**Conclusions: trends and expectations**

Migratory flows tend to react quite quickly and adapt to political and economic shifts occurring in the countries of origin, transit and destination. The high number of variables at play, then, makes it hard to come out with reliable forecasts, and obliges one to draw on existing trends and likely scenarios.

In the long-term, only a strong and determined government in Tripoli might be able to significantly curb migration in Libya. Yet stability is not in sight yet. A low-intensity conflict with sudden eruptions of large-scale violence is likely to continue in the foreseeable future. What can change are the countries of origin and transit from where migrants reach Libya.

In 2017, the increasing limitations prompted by EU action in Agadez obliged smugglers to circumvent the Saharan city. Smaller and more dangerous paths across the desert were developed, transiting for



instance through Arlit in Niger and Gao in Mali. In the meantime, the consolidation of smuggling networks started to involve other countries in Africa and elsewhere, which were previously left out of the main migratory routes. For instance, growing numbers of Guineans and Bengalese are part of this trend.

Since mid-summer 2017, we are experiencing a significant change on CMR, as volumes of migration shrank abruptly. While this was widely seen as the result of the co-option of Libyan militias into anti-smuggling efforts prompted by the Italian and other EU governments, this solution proved short-lived and unsustainable, as armed clashes soon erupted in key transit nodes. Although the overall number of arrivals in southern Italy has declined, deaths at sea remain just as high and new trans-Mediterranean routes are being carved out, including from Tunisia, Algeria and

Egypt. The current management of migratory flows amounts to a veritable time-bomb. Figures largely exceed the absorption capacity of neighbouring and transit countries. While the legitimacy of the current legal framework externalising border control remains debatable, the humanitarian emergencies and political controversies resulting from this situation risk to be unsustainable in the long run, and to further exacerbate existing tensions and security cleavages.

NOTES

<sup>1</sup> <http://frontex.europa.eu/trends-and-routes/western-african-route>

<sup>2</sup> <http://frontex.europa.eu/trends-and-routes/central-mediterranean-route/>

<sup>3</sup> <http://frontex.europa.eu/trends-and-routes/eastern-mediterranean-route/>



# MIGRATION NETWORKS, AGRICULTURAL PRODUCTION AND FOOD NETWORKS

*With contributions by*

*Luca Di Bartolomei, Fabrizio Maronta and Luca Raineri*

*Throughout history the Mediterranean emerged as a space of connectivity between civilizations, involving trade of people, ideas and goods, including the establishment of a series of food routes. The Roman Empire provides an example of this Mediterranean food infrastructure. In the current globalization of food markets, a key issue linking the two shores of the Mediterranean is the exploitation of cheap. The current experience with illegal employment and exploitation of agriculture workers (“caporalato”) is illustrated as a case study of this phenomenon.*

Throughout history, the Mediterranean emerged as a space of connectivity between civilizations, involving trade of people, ideas and goods, including the establishment of a series of food routes. The Roman Empire provides an example of this Mediterranean food infrastructure. In the current globalization of food markets, a key issue linking the two shores of the Mediterranean is the exploitation of cheap. The current experience with illegal employment and exploitation of agriculture

workers (“caporalato”) is illustrated as a case study of this phenomenon.

## Food networks and migration networks

In this section, we will offer a view of the Mediterranean as a space of connectivity for food and migration, offering insights based on three heterogeneous examples; the infrastructure and

food network of the Roman Empire, a case study on the exploitation of agricultural labourers, an analysis on the enduring economic relevance of remittances.

*Across history, the specificities of the agriculture carried out in the broader Mediterranean basin have been inextricably connected to major patterns of human mobility.* The agro-biological micro-niches of the connective space from the Sahel to the Alps (through the Sahara and the Mediterranean) have in fact represented a structural incentive to the establishment of a *trans-regional trading system*. Meanwhile, labour intensive productions have prompted a demand for workers from across state borders, and fostered the hybridisation of social, cultural and food traditions.

The Roman Empire made the Mediterranean Sea a space of interconnected trading hubs where people, ideas and goods – especially agricultural ones – flew relatively smoothly. The Arab conquest of the southern Mediterranean and Saharan spaces was accompanied by the creation of artificial oases, planned to perform the role of productive sites, trading facilities, and centres of cultural and religious propagation. Sub-Saharan Africans were increasingly pulled, more or less coercively, to work in these areas and grow foodstuffs. The network thus created stretched from the Mediterranean shores to the Sahel, and made the Sahara Desert “*the other face of the Mediterranean*”, as the historian Fernand Braudel suggested (on the Sahara network, see also Brachet et al. 2011).

## BOX - The Roman Empire and Food Routes

by Luca Di Bartolomei

With the end of the Republic and the beginning of the Empire, in 27 BC, the food condition of the Romans radically changed. While previously, in the Italian peninsula, agriculture and sheep farming, at least until the imperial age of the Roman Empire (27BC/395AC), were conducted by small landowners, the Battle of Anzio (31 BC) marked the start of business contacts with Egypt, and thus with the East and Asia.

Therefore, at its peak, “the Roman Empire ruled a quarter of humanity through complex networks of political power, military domination and economic exchange. These extensive connections were sustained by pre-modern transportation and communication technologies that relied on energy generated by human and animal bodies, winds, and currents” (Scheidel et al. 2012). From August to Constantine (27 BC - 337 AD), Rome reached one million inhabitants, controlling 50/60 million people. “Feeding Rome” (Parisi Presicce, Rossini, 2015) became a necessity for the emperor: male, adult, and resident citizens received freely from

the State every month five *modii* of wheat (about 35 kilograms).

Free grain distribution involved the import of wheat in amounts ranging from 9 to 12 million cubic meters per year (up to 84,000 tonnes). Considering the supply of food to the entire city of Rome, the quantity of imported grain (see Parisi Presicce, Rossini 2015; on grain in Rome see also Garnsey 1983) rose to about 50/60 million *modii* (350,000 to 420,000 tonnes). At the end of the Republican Era, wheat consumed in Rome came from Africa, Sicily and Sardinia. During the High Roman Empire (the part of Roman political history dating from the end of civil war in 31 BC to Diocletian’s rise to power in 284 AD), wheat was produced for 1/3 from Egypt and the remaining 2/3 from other regions of Africa (corresponding to today’s Tunisia, Algeria and Libya).

Control of the grain traffic also had a geopolitical meaning in imperial disputes. As Abulafia recalls, “in AD 68–9, following the suicide of Nero, Emperor

Otho recruited thousands of sailors to block the threat posed by his rival, and eventual supplanter, Vitellius. Otho could count on the support of the two Italian navies, based at Ravenna and at Misenum, very close to Puteoli. The final victor in 69, Vespasian, also used naval power, but differently; from his base in Egypt he first blocked the grain traffic to Rome, and then, as he approached Rome, he showed generosity by releasing these food supplies to the Roman People, fatally undermining Vitellius” (Abulafia 2011).

In short, with the Pax Romana in the Mediterranean basin, an early “globalization of consumption” was born, with its relocation of production based on specialized monocultures: grain, oil and wine. All of this was possible thanks to an efficient administrative structure. For instance, thanks to the amphorae manufactured where goods were produced, it was

possible to trace trade relations in the Mediterranean area. The amphorae had to certify not only the genus, the amount, the property and the conveyor, but also the quality of the cargo. The Prefect of the Annona needed a global structure that would have control over the whole chain, with two foreign “offices” in Alexandria, Egypt and Numidia, and a host of collaborators, including an attorney at Annona in Ostia, where the grain tax was flowing. According to the ORBIS project of Stanford University, the model of Roman transport system (at its own peak) was built on 632 sites, and covered nearly 10 million square kilometers (~4 million square miles) of terrestrial and maritime space. The baseline road network encompassed 84,631 kilometres (52,587 miles) of road or desert tracks, complemented by 28,272 kilometres (17,567 miles) of navigable rivers and canals, while 301 sites served as sea ports.

## Interdependence, food markets globalization and Mediterranean migration

A closer look at the Trans-Mediterranean network of consumption in more recent times provides further insights on the relationship between the routes for foodstuffs and the routes of migratory flows. By the end of colonialism, the adoption of contradictory fiscal policies among newly independent states nourished a thriving illegal economy based on the smuggling of subsidised goods towards the Sahelian countries, and of livestock northbound. The revenues of these activities were typically reinvested in farmland and livestock. The severe droughts and famines that hit the Sahel in the 1970s and 1980s triggered major migratory flows from Sahelian countries to North Africa and the Mediterranean. Migrations represented a resilience strategy to cope with environmental insecurity. Tens of thousands of people from Mali and Niger thus settled in Algeria and Libya, spreading family networks across state-borders (OECD/SWAC 2014).

Routes and infrastructures developed for the trade of foodstuffs progressively overlapped and intermingled with those of migratory flows, both seasonal and long-term. Migrants often found employment opportunities in the gardens of the very same smugglers that facilitated their journeys, establishing long-term partnerships (on the concept of gardens, adopted by local seasonal migrants, see Scheele 2012; Kohl 2013). Indeed, up-to-date seasonal trans-Saharan migration represents a crucial asset for local food systems, and should be interpreted more as a development opportunity than as the consequence of underdevelopment: during the dry season, thousands of people from the Sahel engage in seasonal migratory patterns to work in north Africa. While contributing to local agricultural activities, they also ensure the resilience of their families and dependents at home. Hence, across the Mediterranean region, agricultural production and migratory flows have grown increasingly interlinked along the supply lines of the food markets.

The current context of food markets globalisation presents no exception. From Cyprus to Sicily, from Greece to Andalusia, Southern Europe’s

finest agricultural products require low levels of mechanization to preserve the quality of the yield. Growing and – most notably – picking fruits and vegetables, such as tomatoes, citrus, grapes, olives and the like, is still a labour-intensive activity. It is also often highly seasonal, and depends on unpredictable productive variables, such as climatic conditions and rapidly changing market demands, which mean that scheduling is not always possible.

These structural conditions have prompted, in southern Europe, a demand for flexible, versatile, efficient and low-qualified workforce, ready to accept the harsh working conditions in the fields. A gap that, in the last few decades, migrant workers have been increasingly filling.

A combination of growing deregulation of the job markets in Europe, multiplying restrictions to the legal avenues for regular migration towards Europe, and unchecked liberalisation of food markets worldwide, has produced disturbing consequences. The exploitation of migrant workforces is widespread across Europe's Mediterranean countries, and significant patterns have been documented, for instance, in rural areas in Cyprus, or in greenhouses in Southern Spain. The analysis presented in the following box focuses in particular on the case of Italy's Southern regions and agricultural districts, such as the plains of Foggia in Apulia, Metaponto in Basilicata, Gioia Tauro in Calabria, Ragusa in Sicily and the Pontine area, 70km south of Rome.

## BOX - Migrants, agriculture and human rights. A case study on “caporalato”<sup>1</sup>

by Luca Raineri

By setting entry quotas for different types of non-EU workers, and by making the issuance of a residence permit dependent on the existence of a written contract of employment, the Italian legislative framework has proved ill-suited to balance the demand and supply of labour in Southern Italy's fragile agricultural sector. As a result, local employers have not disdained to recruit non-EU workers who arrived in Italy irregularly, or on a visa other than the one for contracted employment. According to a report by Doctors Without Borders (Medici Senza Frontiere 2008), between two thirds and three quarters of interviewed seasonal migrant workers in agriculture lacked a legal residence permit and/or worked illegally. *Indeed, while official statistics report that migrants make-up about half of the workforce employed in Southern Italy's agricultural sector, independent reports (Palumbo, Scirba 2015) suggest that this figure would climb up to 80%, accounting undeclared and irregular migrants.*

The lack of adequate legal protection makes these categories of migrant workers completely dependent on informal schemes of negotiations, and therefore vulnerable to different sorts of exploitative practices. As a result, an alarming number of abuses has been documented in the last decade by journalists, NGOs, human rights activists, and migrant workers themselves. Among them, Amnesty International (2012) recognizes that the bargaining power of migrant workers, whatever their migration status, is virtually non-existent, and as a result many sites of agricultural production in Southern Italy are characterized by systematic violations of human rights.

In many cases, seasonal migrant workers are employed for 12-14 working hours daily for a salary ranging between 15 and 35 euros, in spite of the seasonal farming contracts officially foreseeing a daily salary of approximately 50-60 euros, for 6 days of 6.5 working hours each. In some cases, employers

avoid existing regulations by declaring a significantly reduced amount of working hours and days than those actually performed by their employees, and migrant workers refrain from complaining for fear of losing their hard-won opportunity. In the past, migrants in transit accepted these exploitative working conditions for a maximum of a couple of years, or seasons, while waiting to secure a more permanent job in the formal sector. In recent years, however, a longstanding economic crisis in Europe, and in Italy in particular, has reversed the trajectory, and migrants who lose jobs in the north end up in the fields in the south, thereby increasing competition with those who have just arrived.

Authorities have not tackled these problems vigorously, because migrants do not vote, but national stakeholders of the food supply line do. Businesspeople in the agricultural sector complain that current market prices make the national contracts for agricultural labour hardly applicable. According to activist Yvan Sagnet, *“farmers and agricultural entrepreneurs are also victims, to a certain extent. If you do not want to shut down shop, you are forced to exploit. It is a perverse system, because it is the buyer who makes the price. Yet prices are unsustainable, and small farmers don't have the power to resist. At the top of the pyramid, one finds the responsibility of some large-scale retailers, who stay away from the dirt of the fields, and are the real beneficiaries of the ultra-liberalization of food supply lines”*. Buyers, in fact, can purchase 1kg of tomato for 8-9 cents, 1kg of oranges for 6 cents, and with the prices of fuel, fertilizers and seedlings rising, labour cost remains the only source of marginal gains for farmers.

Often, informal mediators – the so-called “caporali” – step in to secure cheap and flexible labour supply for employers and provide seasonal job opportunities for migrant workers. *On top of their remuneration as head-hunters, the caporali take a significant cut of day labourers' meagre salaries in*

*exchange for the provision of a number of “services” linked to the work in the fields, such as access to water, sanitation, food, transport, electricity, etc., where coercion and extortion go hand in hand. While vulnerable EU-citizens have been victims of caporalato, too, the social, economic and cultural segregation of non-European migrants, especially undocumented ones, contributes to reinforcing this lucrative business model.*

Housing is a case in point. Every year, seasonal workers move across different Italian regions following the harvesting schedule of local yields: Apulia's tomatoes from June to September; Calabria's olives and citrus from November to February; Sicily's greenhouse-grown vegetables in early spring, and so on. Lacking the economic resources and legal status to access adequate housing facilities, migrant workers set up provisional informal settlements close to the productive sites, which have become known as ghettos. As the nickname indicates, people face grave distress there, and according Doctors Without Borders the poor living conditions of the ghettos are comparable to those of a humanitarian emergency: two-thirds of ghetto-dwellers sleep on the ground or share a rented mattress, with no access to electricity, water or sanitation. According to Yvan Sagnet, *“ghettos are the consequence of the lack of accountability of agricultural enterprises for workers' accommodation. In the province of Foggia alone we have documented about twenty of them, usually located at the fringes of rural municipalities. Ghettos are isolated, and their invisibility fosters dependency on the caporali and is conducive to exploitation. For example, at Rignano Garganico, more than 5,000 migrant workers lived in houses made out of plastic, cardboard and sheet metal. It is probably the largest ghetto in Europe. However, the mere dismantlement of the ghettos and the eviction of the dwellers is purposeless. In the absence of a redeployment program, people will simply come back”*.

Grave abuses may occur even where housing conditions are less precarious. In the plains of Ragusa, in Sicily, and of Pontine, Lazio, the prevalence of greenhouse farming stabilizes the agricultural production across the year and weakens the dependence on seasonal labour. Migrant workers, however, are forced to suffer different forms of exploitation and humiliating treatment as a bargaining chip to secure their jobs and dwellings. The sexual exploitation of women workers of migrant origin, especially from Romania, is on the rise in Sicily. In the Pontine plain, instead, non-national workers, especially of Sikh faith and originating from the Indian state of Punjab, have been suffering systematic patterns of human-trafficking and labour exploitation since the 1980s, as recent investigations demonstrated. According to sociologist Marco Omizzolo, co-founder of the NGO In Migrazione, “Italian employers hire informal intermediaries to purchase ‘cheap labour’ in their countries of origin. Human trafficking networks then request 12 to 15,000 euros to Punjabi prospective migrants, with the (false) promise to provide permanent and well-paid contracts in the agricultural sector. Punjabis then come to Italy, often times with a regular (provisional) residence permit granted by their employers. But once they get to work, the situation they find is completely different: backbreaking working hours, and miserable salaries, paid irregularly”. In many cases, temporary contracts, declaring a minute amount of the hours actually worked, provide the fig-leaf to cover the actual exploitation, while ensuring at the same time the blackmailing of migrant workers who, on that basis, cannot claim the right to a permanent residence permit. “However, Punjabi migrant workers rarely complain, by fear of dishonouring their families who got indebted to provide them with the opportunity to work abroad. Moreover, we notice an alarming increase of intimidations, threats and attacks against those who protest. Violence against those who claim their rights is becoming systematic”, Omizzolo contends.

And this is where organized crime kicks-in. Mafia-styled vigilantes, both Italians and foreigners, have been responsible for threats, violence and killings aimed at quelling the embryonic protests of migrants. In some cases, criminal organizations have managed to infiltrate the whole supply line of food systems: the proceeds of criminal profits are laundered to buy agricultural land; manpower is supplied by mafia-owned fake cooperatives, colluded *caporali*, or transnational networks of human trafficking; armed vigilantes make sure that exploitative working conditions, akin to enslavement, proceed undisturbed; companies owned by different criminal organisations also intervene heavily in the logistics, distribution, marketing, wholesale and retail of the final products. Not far from Rome, the fruit and vegetable market of Fondi, the fourth largest in Europe, is a case in point. According to a report by the NGO Legambiente, the turnover of agro-mafias has increased by 30% in the last years.

Yvan Sagnet, however, observes that *“one should not confuse labour exploitation and organised crime. Exploitation is larger, stronger, and more structural, because it nestles in the grey area of informality, and is fuelled by the widespread tolerance for illegality.”* The experience of being a slave has changed my life. You realise that, below the surface, another world exists, an underworld of exploitation that cannot be ignored. Many people have only a superficial understanding of mafia, but I have had a first-hand experience. And when you go through all this everything changes, and you only want to make it known, move on and get rid of it. I probably wouldn’t do it again, if I could go back. I wanted to be an engineer, and now my life is threatened and I barely escaped being killed. Sometimes the pressure is unbearable. But I cannot go back, and pretend that I haven’t seen what I have seen”.

In the last years, migrant workers in Southern Italy have increasingly undertaken bold initiatives, sometimes shouldering major risks, and have sparked

mobilisations and protests to tackle these shameful situations. Amidst intimidations and threats, the brave strikes of migrant workers in Apulia in 2011, and in the Pontine in 2016, have led to important changes, with the potential to benefit foreign and Italian workers, as well as the agricultural sector as a whole. Italy has adopted in 2011 a law criminalising the “*caporalato*”, i.e. the “illegal mediation and exploitation of labour”, further expanded in 2016. And in July 2017, 12 individuals were sentenced on the basis of this legislation. Similarly, in the last few years the legislation against human trafficking, including the prevention of the phenomenon and the protection of victims, has been expanded and harmonised.

Sagnet and Omizzolo recognise that addressing criminality, albeit important, is not enough. More

proactive steps need to be taken in order to tackle the root causes of this phenomenon, raise public awareness, and advance sustainable solutions. Inclusion is key, and the contribution of all the actors along the supply line is needed to ensure that new, subtler forms of exploitation do not resurface under the pressure of market constraints. To this end, local NGOs and activists are increasingly promoting projects aimed at fostering access to healthy, eco-friendly, fair and exploitation-free certified food. NoCap, SOS Rosarno, and Filiera Sporca represent cases in point. In Migrazione is greatly enhancing the documentation and dissemination of good practices. A UN agency - the International Organization of Migration - has recently launched the Terra Munda<sup>2</sup> project, aimed at strengthening job opportunities for migrants formerly victims of labour exploitation in Italy’s agricultural sector.

<sup>1</sup> This contribution has extensively benefited from the interviews kindly granted to Luca Raineri in 2017 by prominent actors in the field of migrant workers’ rights, and most notably Yvan Sagnet and Marco Omizzolo. Sagnet, born and raised in Cameroun until he came in Italy thanks to a scholarship offered by the Politecnico University of Torino. In 2011, he significantly contributed to the strike of tomato-picking day labourers in Nardò, Italy, and since then cooperated with several national and international NGOs for the advancement of the rights of migrant workers in the agricultural sector and the fight against transnational organized crime. He is currently president of the Association No Cap. By virtue of his social commitment, in 2017 he

was awarded the title of Knight to the Merit of the Italian Republic. Omizzolo is an Italian scholar and social activist, whose work focuses on the exploitation migrant workers of Punjabi origin in the fields of the Pontino Plain. He has cooperated with several NGOs, scientific reviews and training programmes, and his activities have contributed to key publications of Amnesty International and United Nations agencies. He played a key role in the organization of Pontino migrant workers’ rally in 2016. He is the founder and current scientific advisor of the Association In Migrazione.

<sup>2</sup> <http://www.italy.iom.int/en/activities/vulnerable-groups-and-minors/terra-munda>

## Networks of exploitation and networks of inclusion

As the Milan Center for Food Law and Policy (MCFLP 2017) has shown, starting from data provided by the European Federation of Food, Agriculture and Tourism Trade Unions, illegal work in agriculture affects significantly a number of EU countries. In Romania, Portugal and Bulgaria the rate of illegal work is estimated to be higher than 40 per cent, while in Italy, Poland, Spain and Greece it is estimated to be higher than 20 per cent. The MCFLP has highlighted that a multi-faceted

strategy is needed to tackle these issues, including not only joint efforts in the agro-food chain and public authorities (including further monitoring activities), but also advocacy campaigns and the promotion of a new cultural paradigm, which includes the collection of best practices in the sector (MCFLP 2017).

While awareness and public action is key to break criminal networks and invest in sustainable development, historical examples could shed further light on the opportunities of the Mediterranean trading infrastructure of food and ideas.

All the geopolitical challenges we have presented in the study, particularly concerning Sub-Saharan Africa, require a response in terms of awareness, education and inclusion. Harvard professor Calestous Juma repeatedly called for a joint effort on agriculture in Africa, emphasizing that “Africa can feed itself in a generation” (Juma 2011; Juma 2015). This requires an investment of science, technology, and engineering for the creation of regional markets. It also requires a new pool of leaders, both African and European, both in the public and in the private sectors, willing to cooperate to support Africa’s improvement in agriculture and food. But all this has also to do with the empowerment of vulnerable individuals, starting from women and children.

The following box will offer an analysis on a specific nexus between migrants and home countries, those of remittances. Understanding the scale and the role of remittances could be key to address the challenge of sustainable development. Moreover, in the following sections we will focus on the role of innovation in Food Value Chains for sustainable development, showing how agro-food systems and rural development can contribute to mitigate migration pressures. We will also address the issue of food and integration, by analysing Europe’s nutritional transition through the lens of the consumption of ethnic food and by providing a series of best practices on food and integration in countries of origin, transit and destination of migrants.

## BOX - Remittances still matter

by Fabrizio Maronta

Given all the environmental, social and economic fragilities highlighted in the previous sections, it is no wonder that external financial flows – foreign direct investment (FDI), aid and, crucially, remittances – remain of utmost importance for most of Africa.

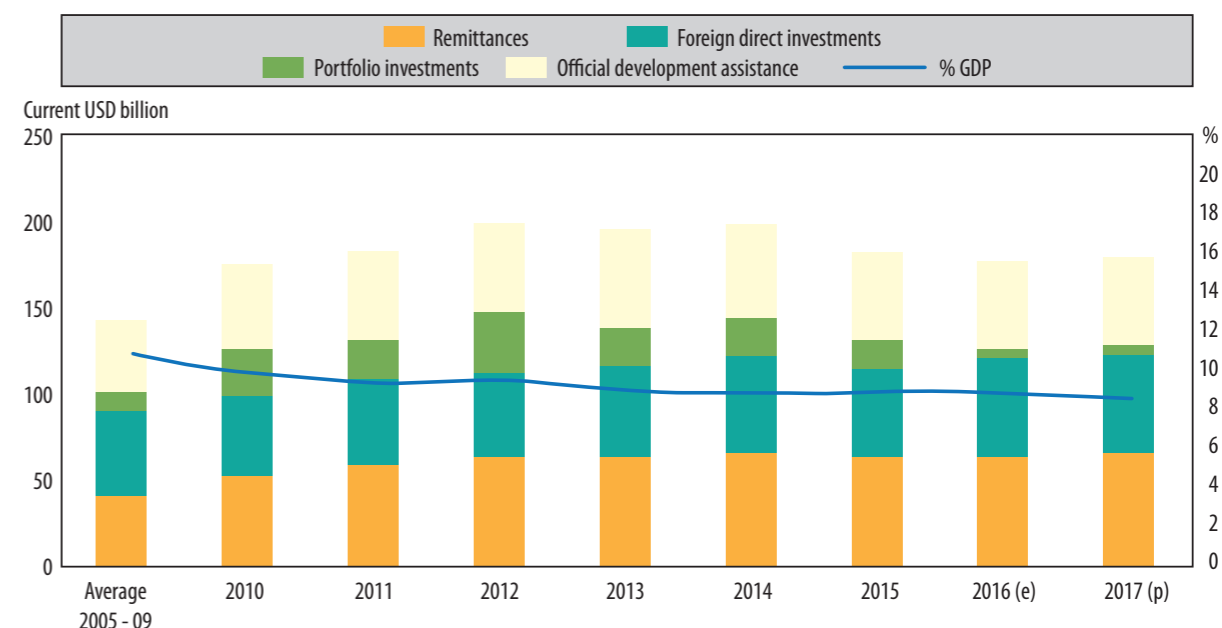
While FDI from Europe and North America is decreasing, Far and Middle East countries are increasingly investing in Africa. In particular, Chinese investment continues to rise, despite the country’s slowing economy. Chinese investment in Africa in 2016 increased 1,400% compared to 2015. The leading investors after China were the United Arab Emirates (USD 14.9 billion), Italy (USD 11.6 billion), the United States (USD 10.4 billion), France (USD 7.7 billion) and the United Kingdom (USD 7.5 billion). (AfDB/OECD/UNDP 2017; fDi Markets 2016; OECD/ATAF/AUC 2016).


Almost equally important are migrant remittances, which can be defined as the funds sent by migrants

to their country of origin via wire, mail, or online transfer. Remittance flows have grown substantially and steadily over the last years, accounting for 51% of private flows in 2016, compared to 42% in 2010. They rose from USD 11 billion in 2000 to USD 64.6 billion in 2016. Between 2015 and 2030, an estimated USD 6.5 trillion in remittances will be sent to low and middle-income countries. As foreseen by a recent study by IFAD presented during the 2017 Global Forum on Remittances, Investment and Development, most of these resources will be used by remittance-receiving families to increase their income, achieve better health and nutrition, foster their education, improve their housing and sanitation, and pursue entrepreneurial projects. (World Bank 2016a; IFAD 2017).

Being less volatile than development aid and FDI, remittances represent a lifeline that sustains household consumption and increases foreign currency reserves. They also allow for investments, including in small businesses and basic social services. In addition, migrant remittances have the advantage

### EXTERNAL FINANCIAL FLOWS TO AFRICA, 2015-17



Note: ODA estimates (e) and projections (p) are based on real increase in Country Programmable Aid (CPA) in OECD (2016). The forecast for remittances is based on the projected rate of growth according to the World Bank. (This graph excludes loans from commercial banks, official loans and trade credits.)  
Sources: Adapted from African Economic Outlook data, IMF (2016a), OECD (2016) and World Bank (2016b).  
Statlink  <http://dx.doi.org/10.1787/888933474975>

### REMITTANCES: FIFTEEN LARGEST RECIPIENT COUNTRIES IN AFRICA (RANKED BY % OF GDP), 2016

Country	%GDP	USD per capita	Current USD billion
Liberia	30.4	150	0,66
Comoros	21.4	161,4	0,13
Gambia	21	91,3	0,19
Lesotho	17.7	165,3	0,32
Senegal	13.2	127,4	1,96
Cabo Verde	12.1	384,7	0,20
Togo	10	60,3	0,45
Morocco	6.8	209,9	7,10
Mali	6.6	55,6	0,94
Egypt	5.7	204,9	18,66
Guinea-Bissau	5.6	36,3	0,07
Sao Tome and Principe	5.5	93,5	0,02
Ghana	5	78,1	2,15
Nigeria	4.8	108,9	20
Tunisia	4.8	180	2,02

Sources: Adapted from IMF (2016a) and World Bank (2016b).

of increasing inversely with the economic situation of recipients. Migrants are likely to send more money when the situation gets tough in their home country, thus functioning as a counter-cyclical mechanism.

In 2016, the remittances-to-GDP ratio was 10% or more in seven countries, including Gambia, Lesotho, Liberia and Senegal (countries with large diasporas), while remittances per capita were higher

than USD 100 in nine African countries. (World Bank 2016b).

The relative stability of remittance inflows hides important territorial differences. West and North Africa remain the biggest recipients of remittances. In 2016, they accounted for 90% of inflows in the continent. This is mainly thanks to Nigeria and Egypt, by far the largest recipients of remittances: USD 20 billion and 18.7 billion respectively. Together, they accounted for 75% of Africa's total and they are likely to retain this position in the future. They were followed by Morocco (USD 7.1 billion), Ghana (USD 2.2 billion), Algeria (USD 2.1 billion), Tunisia (2 billion) and Senegal (1.9 billion). Kenya and Uganda were the only countries in East Africa to exceed the USD 1 billion threshold, while

in the South the largest recipient was South Africa (USD 0.8 billion). (AfDB/OECD/UNDP 2017; World Bank 2016b)

The contributions of diasporas go beyond financial investment. They encompass technology transfer, knowledge exchange and improved access to international capital markets for home countries. Furthermore, migrants can return home as entrepreneurs and can play an important role for the country's development. Therefore, along with migration routes, we always need to put remittances in the food and migration framework, as a key and constant economic flow that could be channelled also in the support of projects regarding agricultural development in countries of origin.



# SUSTAINABLE AND INNOVATIVE FOOD VALUE CHAINS AS LEVERS FOR RURAL DEVELOPMENT AND MIGRATION FLOWS STABILIZATION

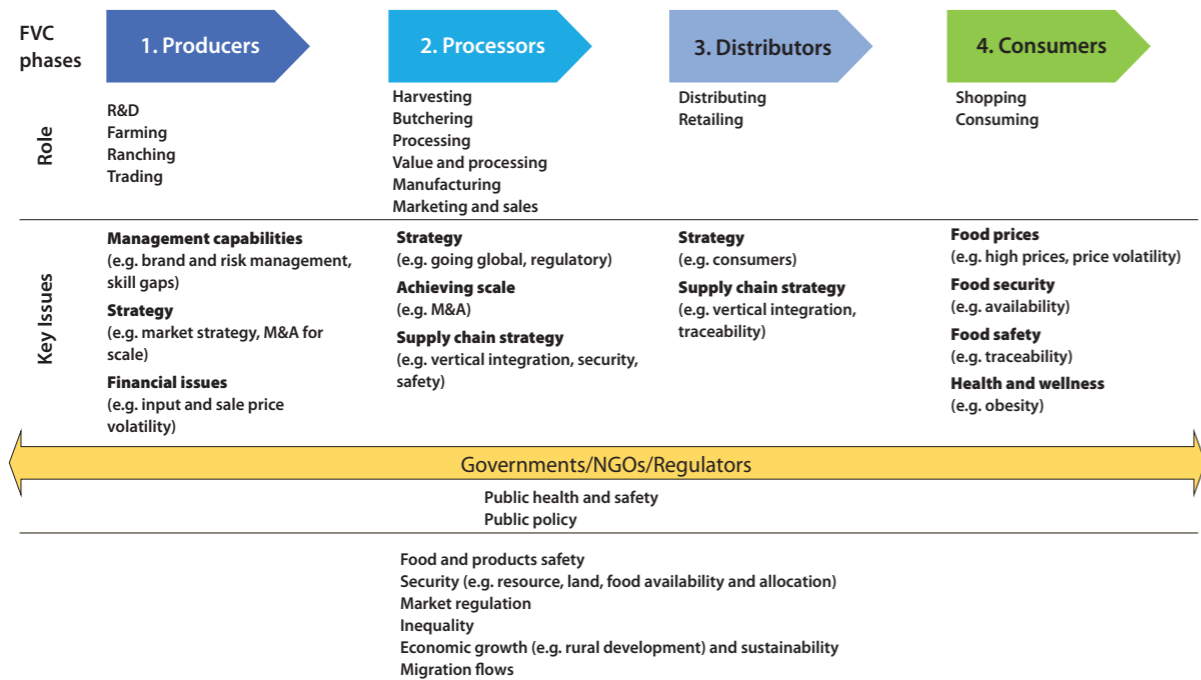
*by Angelo Riccaboni and Sebastiano Cupertino*

*This section highlights the crucial role played by efficient agro-food systems and sustainable value chains in fostering the economic growth of developing countries and the potential for stabilizing international and intra-national migrations around the world. Following findings of latest literature and from experience in the field, lacks in current value chains are presented with the aim to discuss and propose possible solutions able to introduce innovations, also through multi-stakeholders cooperation, and to boost environmental and social sustainability:*

The link between inefficient agro-food systems, rural underdevelopment and migrations was underscored by the FAO (2016). Less wealthy inhabitants living in peripheral areas are often forced to move towards urban areas and developed countries in search for new jobs opportunities with the hope to enhance their social and health conditions. Migration flows

are driven primarily by demographic unsustainable growth, rural poverty and food insecurity, lack of per capita income, high inequalities between urban and rural areas, limited access to social protection mechanisms, climate change, natural and environmental disasters, and the depletion of resources (FAO 2016).

**Fig. 1 - A SCHEMATIC REPRESENTATION OF FOOD VALUE CHAIN**



Source: Readapted by the authors from Deloitte (2013, p. 3).

Given these premises, and taking into consideration the large number of people employed in agriculture and similar activities, especially in developing countries, it is here suggested that *agro-food systems and rural development can play a key role to mitigate migration pressures*. To this purpose, a number of factors are crucial, starting with the implementation of international and national policies aimed at improving a better use of natural resources and the stabilization of climate change. Policies avoiding oligopolies in production and in distribution of agri-food products and they should eliminate unfair competition are also important for more efficient agro-food systems (Vigani et al. 2015).

To promote more efficient agro-food systems and rural development, and then mitigate migration pressures, also business practices can be relevant. First, legal and economic protection of small

businesses and farming activities and stronger cooperation with stakeholders are needed (IEMed 2017). Secondly, global and regional regulations can promote agro-food firms, through direct financing, matching grants, taxation policies, public procurement policies, and recognizing creativity and innovation. Thirdly, banks and financial institutions play a key role in supporting home-grown domestic businesses.

*To promote rural development, we should take into consideration also the key role played by Food Value Chains (FVCs), particularly in developing countries and in the Mediterranean area.* The expression 'Value Chain' means a vertical interaction or a strategic network within different players among a specific supply chain (Hobbs et al. 2000). A FVC is the sum of those processes useful to bring a food product from conception, through the different phases

of production, until the delivery of goods to final consumers (Hawkes et al. 2012). FVCs are typical structured networks (see Figure 1) including equipment dealers, seed suppliers, food processors, distributors and even government regulators, consumers (De Pee et al. 2017).

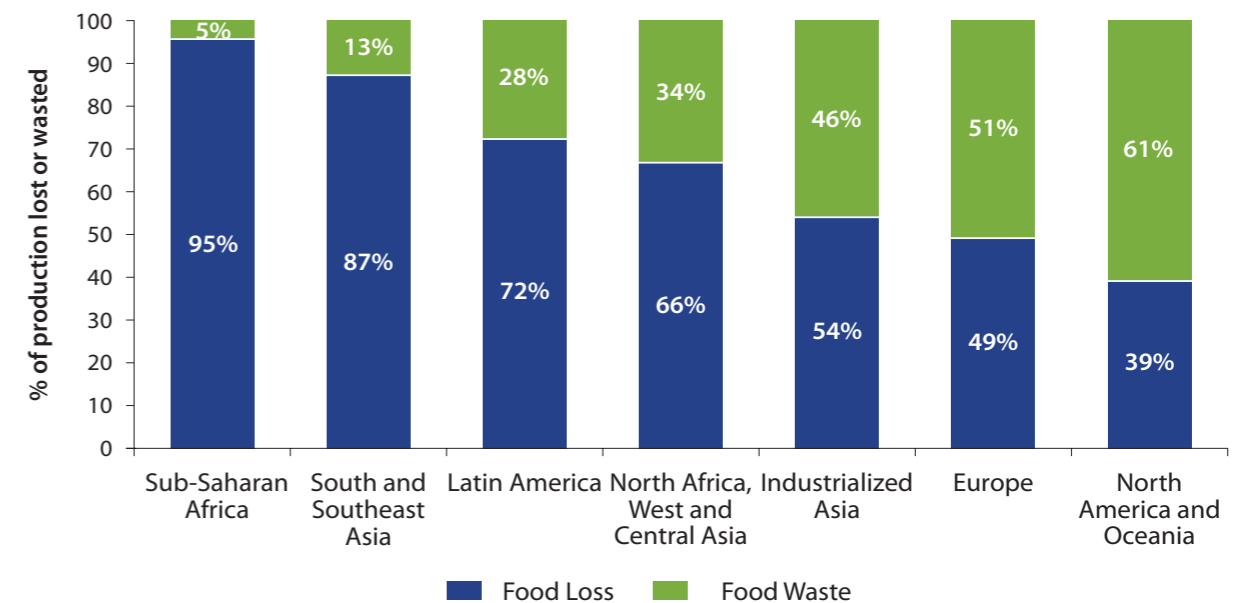
*Major weaknesses of FVCs, particularly in developing areas such as African and MENA countries, contribute to an inadequate economic development of rural areas and to food insecurity and unsafety.* Consequently, dealing with food and migration it is useful also to defining policies and actions able to deal with such weaknesses, which include:

- losses and wastes along the Value Chains;
- lack of vertical and horizontal integration;
- lack of entrepreneurship, managerial and technical skills;
- lack of innovation.

### Losses and wastes along the Value Chains

Losses and wastes are common in all the phases of the FVCs (pre-harvest, harvesting and initial handling, storage, transport and logistics, processing and packaging, retailing and, finally, consumption activities) (HLPE 2014). This happens with any kind of food commodity, namely cereals, roots and tubers, oilseeds and pulses, fruits and vegetables, meat, fish and seafood, milk. According to WHO (2016), food losses and waste are equal to 1/3 of produced food. At the same time, more than 815 million people all over the world do not have access to adequate food (FAO 2017). Smil (2004) argues for instance that, despite a potential production of about 4,600 kcal per capita, global farming processes, inefficiencies in harvest, transport, storage, and processing produce losses roughly 600 kcal per capita per day. The amount of wastes and losses throughout the phases of the FVC depends heavily on the technologies and production modes used. It also differs in typology and in amount within major world regions, as shown in Figure 2.

**Fig. 2 - FVCS LOSSES AND WASTES BY WORLD REGION**



Source: Readapted by Deloitte (2015, p. 6) based on World Resource Institute (2013).

Developing countries see more food losses than food wastes while in developed countries food is wasted mainly in the distribution phase. In developing countries, the obsolescence of production and storage facilities contributes to losses through inefficiencies and inability to isolate the product from parasites. Minimizing such losses can have significant economic and environmental impacts, with input savings and carbon footprint reductions. In such situation, innovations in post-harvesting and processing phases would give great returns. **Figure 2** shows indeed that in advanced economies the sustainability of food systems is mainly jeopardized by wastes occurring in later stages of FVCs. ***In particular, inefficiencies are caused mainly by retailers and consumers who produce wastes about 40% of total goods produced*** (BCFN 2016a; Venkat 2011; Gustavsson et al. 2011).

### Lack of vertical and horizontal integration

FVC integration is defined as the process through which “supply chain partners interact at all levels to maximize mutual benefits” (SCHUB International 2013). Integration is closely linked to the concept of collaboration, which represents an essential condition for aligning objectives and activities of businesses working in each FVC (Mathu, Tlare 2017). Moreover, according to Han et al. (2013) FVC integration could be a valid response to growing market complexity, because it allows faster decisions, higher profitability for all the partners, greater product quality, higher degree of responsiveness to markets and innovation.

The process of integration in FVCs could assume two different forms, such as vertical and horizontal. While the vertical form leads an integration among economic actors of the same value chain ensuring a higher coordination useful to regulate efficient good flows in terms of quantity, quality and market timing, the horizontal integration refers to cooperation among firms working in the same phase

of a same value chain. In any case, both vertical and horizontal integration in FVC are important for the business success, representing two approaches with the same aim to exchange information, competences and knowledge among different players supporting the growth of all of them (Kissoly et al. 2017).

One of the main obstacles to vertical integration is fragmentation, that is a high number of enterprises, as this situation makes it difficult efficient cooperation (Porter 1986). Generally, and particularly in developing countries, FVCs are often characterised by a large number of small actors, which are not able to reach the minimum conditions for survival and for investing in innovation (Bell, Pavitt 1992). At the same time, it should be emphasized that an excessive integration can bring several problems, especially when an entire value chain is in the hands of few actors. In this case, diversity and biodiversity could be not any longer relevant, local values might be overlooked, giving way to ‘manufacturing’ attitude. Furthermore, if the coordination is left only to the power of single actors (Touboulic et al. 2014) or to the market, it is very likely that the smaller actors and those in the first phases of the FVC will suffer, with the advantage of the greater actors and the firms of the distribution phase.

FVCs are often characterised also by a lack of horizontal integration, especially in developing countries. If competitors do not talk to each other, they are probably ‘captured’ by the leader of the FVC and loose market opportunities. Moreover, in developed and particularly in developing countries FVCs are commonly affected also by difficulties in integration within farms and food firms with the other actors of the economic scenario, such as financial institutions, innovators, development cooperation institutions, research centers and consultants (Martí, Mair 2008). The relationships with such actors are key to foster innovation and finding new opportunities. Not being able to relate with them reduce the efficiency of such firms and the capacity to take advantage of new market and

innovation opportunities. ***The typical cultural ‘conservativeness’ of farmers and managers*** (Menozzi et al. 2015) prevailing in agro-food sector as well as ***the lack of entrepreneurship*** could be the main factors to explain such limitation.

The common widespread of fragmentation characterizing food systems both in developed, in emerging and underdeveloped countries leads several small farming and agro-business activities in facing hardly to: operating constraints, which limit their access to public services and credit, in adopting new technologies and in acquiring trade strategic information; market failures, such as higher transaction costs due to less bargaining power with buyers and intermediaries. These limitations especially in rural areas and in absence of integration processes and mechanisms among FVCs penalize a lot farmers and smallholders in developing their business till to drive a large number of those people to migrate in urban or other socio-economically advanced areas.

Filling the gaps of fragmentation in FVCs, the integration among firms could be enabled through the following coordination mechanisms (Handayati et al., 2015; Arshinder et al. 2008):

- supply chain contracts;
- information sharing platforms, using also digitalised systems ICTs-based;
- joint decision-making processes;
- collective learning pathways.

### 3. Lack of entrepreneurship, managerial and technical skills.

Given the complexity of food systems and markets, it is more and more important to ***couple the agricultural and product knowledge with entrepreneurial capabilities and managerial skills*** (Mäkinen 2013). Agro-food systems, especially in developing areas, are characterized by the lack of entrepreneurial and managerial

skills, due to: (i) the small size of farms and firms (Deakins et al. 2016, Al-Sharafat 2016); (ii) the low levels of education and training, inefficient in enhancing managerial abilities and cultivating future entrepreneurs (Kahan, 2012); (iii) the cultural unwillingness to change management approaches characterizing generally the agro-food sector, particularly many farmers’ decision-making processes (Menozzi et al., 2015); (iv) the gaps of proper incentives and the limited impact of training centers and agricultural extension services (Knickel et al. 2009). These limitations affect negatively the growth and the development of businesses, causing losses in opportunities and jobs till to drive people to migrate from rural to developed areas.

More and more often, decisions should be based on forecasting and the use of reliable financial and market information, giving a strategic value to marketing activities. Product quality, and not cost reduction, should be considered as the driver for success and management control systems and financial analysis tools be introduced. Human capital, international activities and younger generations should be valorised, balancing organisational and technological innovation with the respect of local knowledge and values. Environmental and social sustainability should be considered a strong ally for success and not a constrain for daily activities. ***On the contrary, most SMEs in the agricultural sector have a deficit in entrepreneurial knowledge and in the application of managerial tools and practices.*** Such a deficit can be a major obstacle to new business opportunities, to useful horizontal and vertical integration, to internationalization and to the access to credit (Mbogo 2011), vital to ensure fair profitability and to achieve competitive advantages (Deakins et al. 2016).

### 4. Lack of innovation

Systems often characterized by low entrepreneurial, managerial and technical skills present also less capabilities to innovate.



According to FAO (2014b), innovation in agro-food systems is the process through which individuals or organizations put into use new products, processes or forms of organization to improve efficacy, efficiency, competitiveness, resilience or environmental and social sustainability of agricultural production systems, thus contributing to food security, economic and social development and sustainable management of natural resources. Agro-food firms, smallholders and farmers, especially in developing countries, are very weak in adopting technological and organisational innovations (Drucker 2014).

Lack of entrepreneurial, managerial and technical skills, particularly common within farming and agro-food SMEs in emerging and underdeveloped economies as discussed above, often limit the adoption and the implementation of innovations, reducing both competitiveness and fast business reactions to market, environmental and anthropological changes. These gaps could also act as drivers of migrations. This happens especially in rural areas where farmers and smallholders activities have more difficulties tackling increased adverse context conditions (i.e. market complexity, climate change, limited natural and financial resources, etc.) due to inadequate entrepreneurial attitudes and low both managerial and innovation capabilities.

Innovation is generally seen from a technological point of view. Technological innovation is the implementation of a new product or process that involves new techniques and equipment used to produce goods or services. Organizational innovation is certainly not less relevant than technological innovation for business success. Non-technological innovation in agro-food includes the introduction of organizational practices that are new or significantly improved and the adoption of those that were developed by other companies or organizations (Caiazza et al. 2014). Organizational innovations in business practices include implementation of new procedures, routines among human resources, and

division of labour. New organizational methods in external relations also involve the implementation of changes in networking with external private or public participants (Baregheh et al. 2012). In order to provide adequate market responses and renewed internal needs, it is often essential for businesses to introduce changes in management, organizational structure, internal and external reporting, management and operational mechanisms, and accounting technical instruments (Riccaboni, Giovannoni 2005).

***Technological and organisational innovation in the agro-food sector needs to be sustainable from an environmental perspective and socially inclusive.*** A sustainable perspective is important not only for ethical reasons and in the interest of human mankind and future generations, but also for business reasons. These include the following:

- food systems have a great impact on the environment, and therefore without attention to it, activities of any firm and farm can be at risk (Ericksen et al. 2009);
- consumers are showing greater attention to sustainable development issues, opening new market opportunities (Vermeir, Verbeke 2008);
- being sustainable can allow savings in the use of costly resources such as water and energy (Willard 2012).

Introducing sustainable innovations in the agro-food sector is not easy in both developed and developing countries. Besides a greater awareness of the above cited advantages, it is necessary not only to find concrete technological, social and organizational solutions but also:

- to re-orient mindsets and behaviours towards a sustainable development perspective, careful about social principles, the impact of activities on natural resources, and the nexus between water, food and energy (FAO 2014a);

- to strengthen partnership and institutions dedicated to innovation and to the funding of innovation, engaging all stakeholders, especially those from the private sector (Larsen et al. 2009).

The extent to which institutions contribute to sustainable agro-food systems and FVCs varies by country and by type of institution. In any case, the use of emerging technologies and indigenous knowledge requires adjustments in existing institutions and infrastructures, adapting innovations to local conditions and values. It is fundamental to take advantage of the relationships between any food product and its place of origin, with its values, principles and traditions (Belletti et al. 2017).

In any case, new approaches need to be adopted to promote close interactions among government, business, farmers, academia, and civil society (Lachman 2013). ***Positioning sustainable agro-food systems as a knowledge-intensive structure requires changes in existing learning institutions, especially universities and research institutes. Key functions such as research, teaching, agricultural extension services, and consulting need to be more closely integrated.*** Research and innovation initiatives should be taken according to a joint programming perspective, as environmental and social challenges do not know national borders. Institutions should promote agricultural trade and help integrate economies into world markets. They are fundamental also to human development, including the delivery of health and education services. Institutions can contribute also providing agriculture-related facilities able to increase productive capacities of farmers and providing working capital and long-term credit availability (Rundgren 2016).

## Concluding remarks

We have just underscored that to improve the efficiency of food systems and rural development,

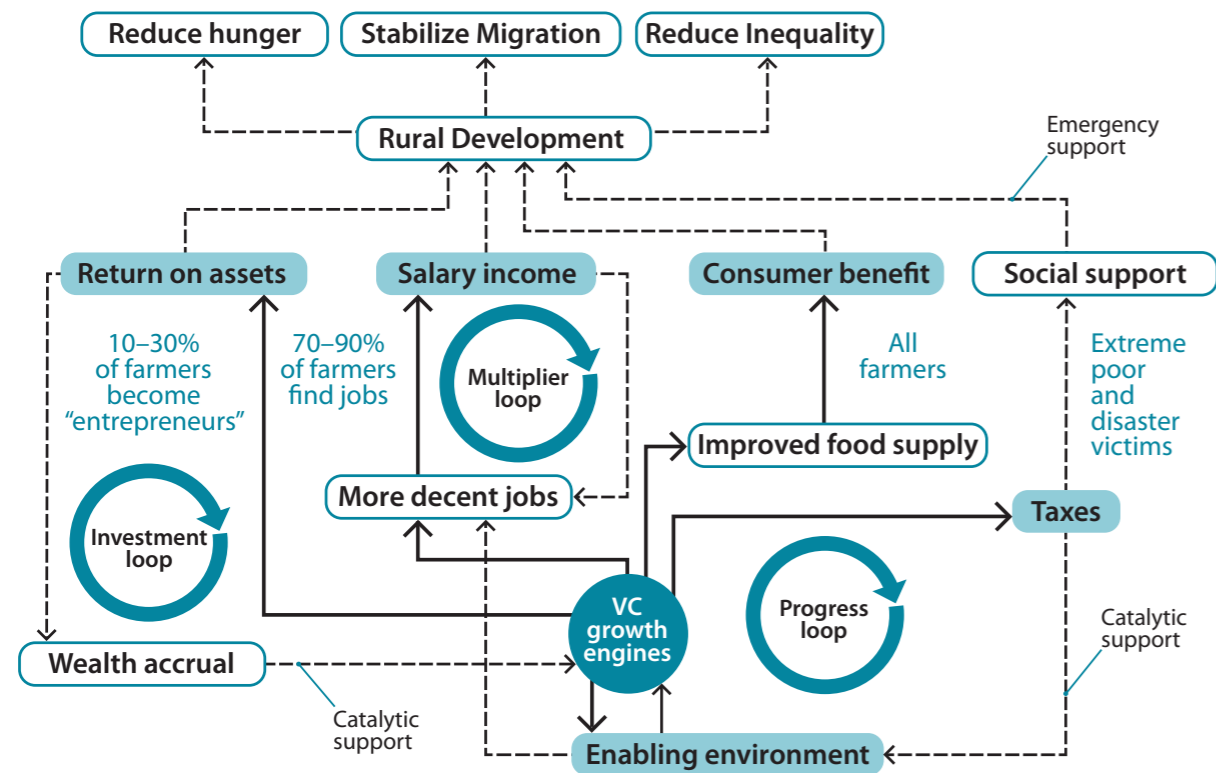
shifting to more sustainable Food Value Chains is essential. Producing and transferring value along the food systems in more sustainable ways means that each FVCs partner should activate synergies to change competitive seller-buyer interactions in cooperative common way (Simatupang, Sridharan 2002). Producers, processors and distributors should share goals, managerial capabilities, resources in terms of knowledge, technologies, data, employees, strategies and profitability.

Cooperation among partners is key to introduce innovative economic or legal mechanism for a fair distribution of profitability among partners of the FVC. This is a crucial theme to promote rural development (FAO 2014c). ***Without a fair distribution of profitability, the weaker partners, usually the rural ones, will not survive.*** In order to make the leader of the FVC accept such fair distribution, goals, initiatives and operations must be shared and decided together. A new way of doing business needs to be defined, able to produce a higher added value, so that everyone can be given the right return on his investments and efforts.

Therefore, consumers' needs are better fulfilled in terms of improved product quality and services. This breakthrough might induce, in turn, even more robust forms of coordination along FVCs through the implementation of technological and organisational innovations and strategies able to foster a better use of raw materials and natural resources.

***The diffusion of more sustainable FVCs could help dealing with food insecurity through the integration of cooperative public-private activities implemented by different stakeholders (governments, firms, educational and financial institutions, scientific R&D and innovation units, NGOs, consumers' associations, farmers, etc.),*** in order to co-create and spread added-value by technological, organizational and social innovations

**Fig. 3 - THE SUSTAINABLE FOOD VALUE CHAIN DEVELOPMENT PARADIGM**



Source: Readapted by the authors from FAO (2014c, p. 15).

(Chesbrough et al. 2006), useful in integrating social-environmental externalities in food value and in boosting sustainable development locally and globally. All this could ensure new worthy job opportunities, fair business partners profitability and salaries, reliable supply contracts for SMEs and farmers, and affordable and healthy food (Touboulic 2015; FAO 2014c).

FAO (2014c) argued that Sustainable FVCs (SFVCs) might promote growth loops in terms of investment, economic effects, and progress (see Figure 3).

According to this approach, the enactment of the three loops leads to positive impacts on the economic, social and environmental dimensions of sustainable development. *In synthesis, SFVCs are the engine for enhancing working conditions,*

*improving financial, environmental, social and farmers' performance, enabling environment, increasing consumer benefits, and intensify taxes revenues.* This process can also support rural development around the world, leading to the reduction of hunger, inequality and finally stabilizing migration flows (FAO 2014c). Taking into consideration such sustainable development perspective, the traditional FVCs archetype presented above can be represented as shown in Figure 4.

More sustainable FVCs imply a bottom-up approach followed by all economic actors, pointing out that the needs of entrepreneurs, managers and farmers should be moved by greater environmental and social awareness and higher pro-activity in cooperation and innovation (Porter, Kramer 2011).

**Fig. 4 - REVIEW OF TRADITIONAL SCHEME OF FOOD VALUE CHAIN IN A SUSTAINABLE PERSPECTIVE**

FVC phases	1. Producers	2. Processors	3. Distributors	4. Consumers
Role	R&D Sustainable farming production Fair trading	Precision harvest Eco-friendly processing and Manufacturing Value and processing in triple bottom line approach	Distributing Retailing	Shopping Responsible consuming behaviour
Drivers	<p><b>MANAGEMENT</b> Entrepreneurial and managerial skills Cultural change for technological and organisational innovation</p> <p><b>STRATEGY</b> Business strategies compliant with higher ethical and CSR standards</p> <p><b>FINANCIAL</b> R&amp;D investments Enhancing profitability and growth performance in long-term</p>	<p><b>MANAGEMENT</b> Smart and flexible Business Model Leadership and vertical supply chain integration</p> <p><b>STRATEGY</b> Achieving scale Process activities compliant with CSR standards</p> <p><b>FINANCIAL</b> R&amp;D investments</p>	<p><b>MANAGEMENT</b> Supply chain integration Traceability</p> <p><b>STRATEGY</b> Business strategies focused on high quality output and transparency Compliance with sustainable standards</p> <p><b>FINANCIAL</b> Equal remuneration of suppliers</p>	<p>Food prices which take in account positive and negative externalities</p> <p>High quality of products</p> <p>Local and healthy food</p>

Source: Readapted by the authors from Deloitte (2013, p. 3).

Sustainable business models should be defined at the level of both single organizations and the whole chain (Varsei et al. 2014), together with common managerial and financial tools and strategies able to support R&I activities along the FVCs.

Public-private investments should be allocated in cooperative R&I activities, to implement entrepreneurial and managerial skills, improved by capacity building processes and knowledge sharing activities among producers, processors and distributors. Businesses involved in sustainable FVCs should adopt innovative business models useful to support proactivity, strategic orientation, collaboration, management control mechanisms, integrated performance measurement systems and risk management (Beske et al. 2014).

*Involvement of public and private economic actors should play a crucial role in solving complex and transversal issues about global and regional current agro-food systems,*

*starting from those as weak as the African ones, and their related food value chains. This effort could be able to foster an extensive sustainable economic growth, the preservation of biodiversity, a general improvement in health by affordable food and increased quality of diets, and finally a normalization in migration dynamics.*

Dealing with weaknesses of FVCs and promoting sustainable food systems can contribute to deal with migration flows aim, also in compliance with *SDG 2 and SDG 12.3 of Agenda 2030* (UN 2015), which involve collaborative partnerships among different players (policymakers, researchers, legislators, investors, farmers, manufacturers, retailers, educators and consumers). In short, more sustainable, integrated, profitable and entrepreneurial FVCs can play a key role to improve food security and safety, fostering, at the same time, rural development and stabilization of migration flows.



# CHALLENGES OF FOOD INTEGRATION IN EUROPE

*by Luca Di Bartolomei*

*The rising consumption of ethnic food in the main EU countries can provide a glance of the change which will be provided by migration trends analyzed during the previous sections. As a powerful cultural signifier, food is crucial for the identity of communities. Europe is facing a nutritional transition whose economic, cultural and social repercussion require a comprehensive investment on education, particularly regarding second generations of migrants.*

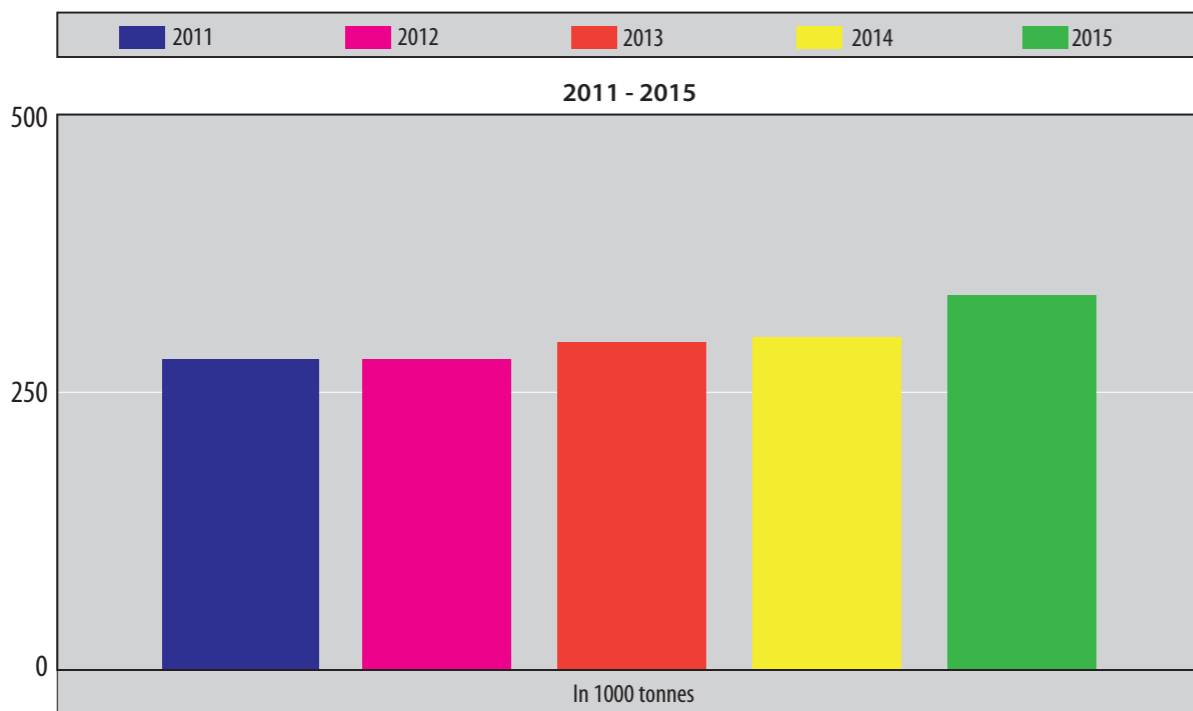
## Trends on ethnic food in main EU countries

By comparing the population numbers with the supply basins of food commodities, it can be noticed that food distribution of the nine major markets in Western Europe (UK, France, Germany, Italy, Spain, Belgium, Netherlands, Austria and Portugal) amounted to € 427 billion in 2016, an increase of € 4.3 billion for consumer products, up 0.9% from

2015. In the countries of our interest, the total volume of the market today amounts to about € 321 billion: Germany 121, France 100, Italy 57 and Spain, € 43 billion<sup>1</sup>. In these markets, the “ethnic”<sup>2</sup> share for household food amounts to about € 3 billion.

Matching migratory reality with aspirations and structural needs by harmonizing and enhancing the cultural and social background is a nodal challenge for the future of European societies and institutions.

## EUROPEAN UNION IMPORTS OF SPICES AND HERBS FROM DEVELOPING COUNTRIES



Source: Eurostat and CBI 2017

For this reason, it is crucial to evaluate the eating habits of migrant communities and how migratory flows are enriching our markets (and what types of markets in particular) with new foods. Moreover, the understanding of how such process affects healthcare systems is of particular interest. The first question to ask is therefore whether the demand for ethnic food (as ingredients and as food) is increasing in Europe. It can be anticipated that the answer is affirmative.

Within this perspective, the “migration-food issue” is affected by several different factors:

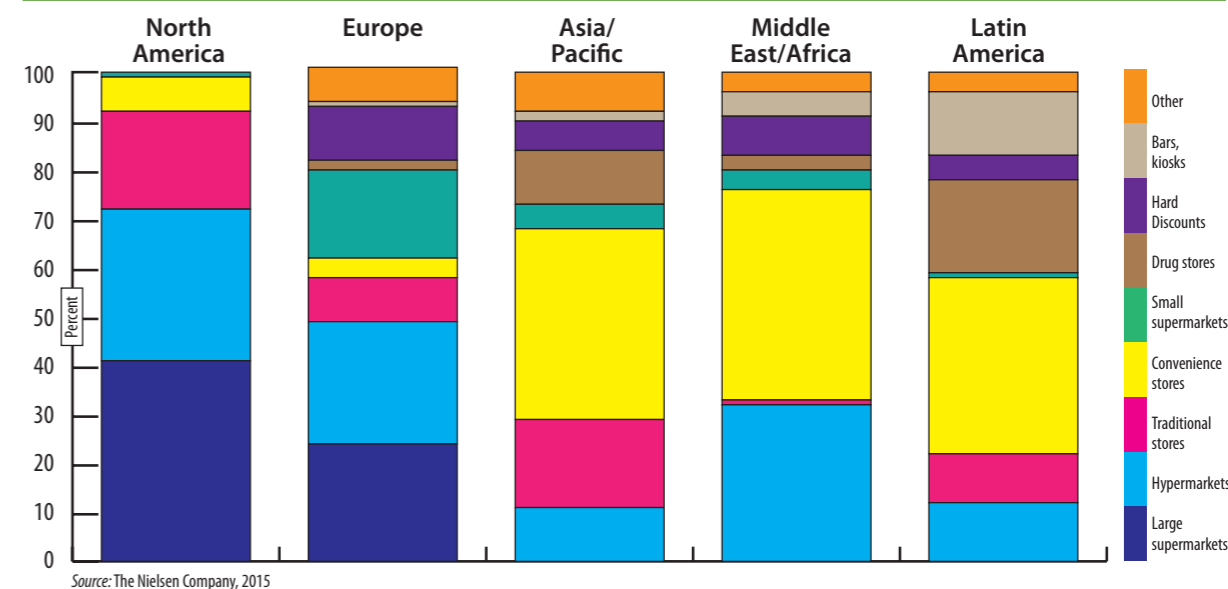
- (A) the age, cultural and social level, gender, religion etc. of the immigrant population;
- (B) the activity of large distribution chains on particular products that may be connected to the food culture of a given country and the cost of imported raw materials;
- (C) current migratory laws and regulations.

*Worldwide, the market has grown significantly from € 26.1 billion worldwide in 2014 to € 31.52 billion, according to the Ibis World Market Report<sup>3</sup>, at the end of 2017.*

To have a comparative dimension we can take the case of the United States: here the ethnic household food market reaches a business volume of € 10.5 billion. Push and support for a cross-border market comes from the constant search for new flavors by chefs, food producers and indigenous consumers, which will ensure, for example, the continued growth of the spice and herbs market, up to € 8.74 billion in 2020 with a growth rate of 5% year on year.

*The figure above represents EU imports of spices and herbs from developing countries* (CBI 2017). But how different are national markets and which is the composition of the demand within ethnic communities? Different communities - that naturally vary widely from country to country - face

## FOOD DISTRIBUTION



Source: The Nielsen Company, 2015

different problems. For example, in Western Europe significant differences are reflected in the food market: a. United Kingdom (Indians, Pakistani and Bengali communities / 87% supplied by the Mass Market Retail); b. The Netherlands (Indonesian, Turkish and Moroccan communities / 53% supplied by MMR); c. Germany (Turkish community / 47% supplied by MMR); d. France (Moroccan, Algerian, other North African communities and French-speaking countries of West Africa / 69% supplied from MMR)<sup>4</sup>.

Ethnic food tastes vary from region, country and even buyer. Indian food in the UK tastes different from that in Germany and uses different ingredients and mixtures. *For immigrants, finding ingredients to prepare traditional dishes is still the biggest obstacle to overcome.* The progressive global urbanization and the consequent large-scale distribution of large-scale circuits have lowered the cost of ethnic products, facilitating the task of millions of migrants. At same time, it favors products that meet the taste of Europeans.

*As can be seen from the figure above, the global composition of food distribution is heterogeneous.*

While hypermarkets, large supermarkets and grocery stores account for 93% of North American purchases, they play a much smaller role in Europe (55%), Latin America (46%), the Middle East and Africa (38%) and Asia (36 %); furthermore, in Europe and Latin America small supermarkets account for almost 20% of sales. It is hard to say whether these small supermarkets, as well as traditional forms of commerce, will retain their market share. Ethnic food is often a specialized area; therefore, larger chains find that it is not useful to compete with smaller companies that have a better cultural understanding (FAO 2017b). *However, there is room for diversified and probably specialized distribution patterns, given the emergence of (a) e-commerce distributors focusing on the last mile of the distribution system; (b) increasing demand for ethnic, ethical and ecological food.*

### The interaction of food, health and culture

*For anthropologist Claude Lévi-Strauss, men's relationship with food is analogous to their relationship with language. Both*

*relationships occur naturally and culturally at the same time.* Each ethnic group defines its identity<sup>5</sup> in relation to the foods that make up its primary food base (in Mediterranean cultures, for example, wheat products), but also in relation to special foods that celebrate social relationships in ritual mode or are part of religious precepts. *In Mediterranean history, oil and lard consumption was a result of the interaction between production specialization and religion as a prescriber of food habits (González Turmo 2012).*

*Food, therefore, is a powerful cultural signifier. Through it, we can manifest inclusiveness, belonging, attachment, in short being a symbolic expression of social bond. On the contrary, it can represent exclusivity, generate stereotypes and feelings of disgust that demarcate boundaries.*

Today, ethnic minorities are a significant and growing part of the population in European countries. Immigrants from low-income countries represent an increasing share of the population in Europe, set to increase further over time, given the future scenarios and demographic trends. Among the social changes and changes in eating habits we are witnessing a kind of nutritional transition: on the one hand, the adoption of local food culture by migrants; on the other hand, the integration of migrants' food habits by the overall population, generating new dietary models (on the Mediterranean diet, see BCFN 2016b).

Within this framework, the health status<sup>6</sup> of many ethnic minorities is worth studying, both in the comparison to the indigenous population and in the comparison to different groups of ethnic minorities (see Ottesen, Wandal, 2012; Vandenheede H. et al. 2012 on diabetes). An example comes from a study based on data from a French national survey (Wenner et al. 1995) which compared food habits of three groups of migrants from Maghreb to Italy,

Spain and Portugal with those of French nationals. The study found a lower consumption of meat and dairy products among migrants and their higher consumption of starchy foods and dried vegetables. The authors concluded that immigrants had a weaker perception of preventive messages. More recent studies emphasize differences in food consumption between migrant communities in Europe and their compatriots in countries of origin. A study on Ghanaian, for example, found significant differences between food preferences in rural Ghana (starchy foods), urban Ghana (animal-based products) and in Europe (a highly diverse diet) (Galbete C. et al. 2017).

More generally, food transition studies have highlighted a process of change in immigrant groups. It generally begins with the replacement of rice with bread, meat and then baking methods. At a later stage of the transition, there is the shift from whole milk to skim milk and an increase in coffee consumption. The process closes with the adoption of baked bread, breakfast cereals, salads and fruit. In addition, fast food and prepared meals are picked up, beginning with breakfast and meals eaten outside the home, while the main meal is the last to change. Although the distinction between Western and traditional diet models is not always clear, the main dietary immigrant trend is a substantial increase in the consumption of fat and refined carbohydrates, resulting in low intake of fibers. Somehow, we could say they firstly develop our "food vices". The figures also indicate an increase in the consumption of meat and dairy products. All of these dietary changes can contribute to a higher risk of obesity, with strong propensity to develop type 2 diabetes (T2D) and cardiovascular disease (CVD). A study on the prevalence of diabetes mellitus and cardiovascular disease among the Turkish and Moroccan ethnic groups in the Netherlands has reported a higher prevalence of type 2 diabetes in the Turkish (12.3%) and Moroccan groups (12.4%) compared with the Dutch indigenous population (3.0%) (Dijkshoorn et al. 2003).

## Conclusion: a research agenda on food and integration

In countries of origin of migrations, high levels of food insecurity result in a greater number of migrations: according to the World Food Program (2017), every percentage point of increase in the food insecurity index forces 1.9% of the population to migrate, while a further 0.4% flee for each year of war.

Moreover, European countries have already changed due to demographic trends and flows of migrants (Collier, 2013). This represents a significant socio-cultural shift. For instance, over the last thirty years, foreigners in Italy have more than doubled. Today, representing a percentage of just under 10%, they definitively marked the transformation of Italy from land of emigration to land of economic immigration and they are certainly a factor, as in other countries, in the consumption of goods and products.

Demographic and geopolitical changes in this field have caused a series of challenges on cultural identities, integration and recognition of rights. Future trends show that the challenges ahead would be even more relevant for European societies.

European and international policies need to consider that food choices in a migratory context have many meanings. They may indicate the will to keep alive memories of experiences of the places of origin, or - on the contrary - the desire to distance from what is perceived as a fragment of the past that must be overcome. Food security should not only be considered as one of the key factors triggering ongoing migration, but it should also be analysed on migration routes and on countries of destination, based on the experience of migrants (see WFP 2017).

For those who migrate, changes in eating habits can also lead to a changes in health conditions. A growing number of mortality studies on immigrants

have shown that when they consume food in a Western way, they experience higher rates of heart disease, high blood pressure, and diabetes. Very often, immigrants represent the poorest part of our societies. According to US studies (Singh, Miller 2004) where the migratory tradition is longer, this "poverty trap" has repercussions on the second generation. In fact, children of migrants born in countries of destination may have a higher standard of living but a lower life expectancy than their parents.

This seems paradoxical to the idea that moving from developing to developed countries improves every aspect of life. For this reason, *food education* - important to all citizens, but above all to second generations of migrants - also plays a central role in the prevention of obesity and many chronic-degenerative diseases. And to be effective, this comprehensive education approach has to be in early childhood, to prevent bad eating habits and lay the foundations for future well-being.

*Almost two thousand years ago, the Roman philosopher Seneca, exiled in Corsica, wrote to his mother Elvia: "Different people have been led away from their homes by different causes; but in all cases it is clear that nothing remains in the same place in which it was born: the movement of the human race is perpetual: in this vast world some changes take place daily"*<sup>7</sup>.

Further research on food and migration in the wider Mediterranean is a crucial interest for all countries involved, given the geopolitical and demographic challenges we are facing. This will be nourished by a proper consideration of the role of food in culture and, therefore, in all integration policies. This is why, along with a series of recommendations which summarize our approach, we have collected a series of best practices on food and integration, regarding countries of origin, of transit, and of destination of migrants.

Novelist Mohsin Hamid writes in “Exit West” (2017): “We are all migrants through time”. The truth is that we are also migrants through food.

NOTES

<sup>1</sup> MacroGeo elaboration on Nielsen Strategic Planner 2016 data.

<sup>2</sup> “In a narrow sense, ethnic foods are defined as foods originating from a heritage and culture of an ethnic group who use their knowledge of local ingredients of plants and/or animal sources. To illustrate, Hindu food from India, Maori food from New Zealand, and Masai food from Kenya are all considered ethnic foods. However, the term ethnic food is ambiguous. Thus, in a broader sense, ethnic food can be defined as an ethnic group’s or a country’s cuisine that is culturally and socially accepted by consumers outside of the respective ethnic group. For example, Greek food, Indian food, Italian food, Thai food, and Korean food are all considered ethnic food outside of their own countries. Furthermore, foods eaten by people of different religions are also considered ethnic food. For example, traditional Buddhist cuisine, Christian cuisine, and Muslim cuisine are also included in the category of ethnic food” (Kwon 2015). Given that the use of the word “ethnic”

changes when the context of ethnicity changes (for example, if a subgroup becomes a majority group, or becomes incorporated into the majority cultural tradition), what may be considered “ethnic food” will undoubtedly change over time.

<sup>3</sup> See <https://www.ibisworld.com/industry-trends/specialized-market-research-reports/consumer-goods-services/food-beverage-stores/ethnic-supermarkets.html>

<sup>4</sup> CBI 2017 and MacroGeo elaboration on Ibis world and Nielsen mass market data.

<sup>5</sup> “...Modern-day Western metropolises are, in fact, full of “ethnic” food stores which, out of religious vocation or community spirit, allow members of a given faith to keep to precise rituals and, together with the flavors of traditional foods, maintain the knowledge of being part of a social universe with its own identity...” (BCFN 2009a).

<sup>6</sup> On food and health, see BCFN 2009b.

<sup>7</sup> We thank Massimo Livi Bacci for the quote, analysed further in his works, including Livi Bacci (2015). The original text is: “Alios alia causa exciuit domibus suis: illud utique manifestum est, nihil eodem loco mansisse quo genitum est. Adsiduus generis humani discursus est; cotidie aliquid in tam magno orbe mutatur” (Ad Helviam Matrem De Consolatione, VII, 5).



CASE STUDY:

# IMPROVING LIVING CONDITIONS AND INCOME IN SENEGAL RURAL AREAS TO PREVENT ILLEGAL MIGRATION BY ENHANCING SUSTAINABLE AGRICULTURE PRACTICES



In Europe and elsewhere, there is a widespread image of Africa as a continent in crisis, whose population seeks en masse to find a route to Europe. The example of Senegal, however, illustrates that African migration is a far more complex phenomenon: movements to and from Senegal has been extensively in connection with other African states. Historically, Senegal was not a country of origin, but rather the destination of migrants. There

is, however, evidence of a turnaround due to the economic crisis that the country has faced during the 70s and that intensified in the 90s, with Senegal becoming more and more a country of emigration and new target regions emerging for Senegalese migrants <sup>1</sup>. International migration was initially a reaction to the economic crisis situation and has gradually become the standard model of social advancement.

Senegal occupies the 162 position (on 186) of the Human Development Index in the rapport of the UNDP of 2016<sup>2</sup>. On a population of about 14 millions of inhabitants on which 63% with less than 25 years old, the country has a very high incidence of poverty. Especially in the rural area where about 70% of the total population live, the poverty is more accentuated (about 50% incidence) bringing with it high rate of unemployment and malnutrition. In the regions of Saint-Louis and Matam, in the north of the country, the departments of Podor, Ranérou, Matam and Kanel results to be the ones with the highest prevalence of both food insecurity and global acute malnutrition (GAM) with values much above the critic threshold of 15%<sup>3</sup>. Moreover, according to the ENSAN report of 2013, in the rural areas also due to the high tax of male emigration, women are responsible for about 82% of the agricultural work. For these reasons, the EU in collaboration with the Senegal state and the Spanish Agency for International Development Cooperation (AECID) a management body aimed at combating poverty and promoting sustainable human development, launched a project in August 2016 to improve the resilience and the living conditions of the most vulnerable populations of these districts.

The project, with a budget of 10 million € mainly provided by the EU Emergency Trust Fund for Africa (8 million €) but also from AECID and from the state of Senegal (1 million € each) has a time-frame of three years with different **aims based on the multidimensional and interconnected determinants of malnutrition**. First of all it wants to improve food security and nutrition by allowing the access to a diversified alimentation, to drinkable water, sanitation and to good food practices. Secondly, it aims to guarantee the access to basic services like nutritional health and functional education. Finally, the initiative wants to enhance the population resilience by improving local communities knowledge and abilities in governing and organizing. The project is developed through the collaboration with the *Cellule de Lutte contre la Malnutrition* (CLM) that is

coordinating the activities with both the state for establishing some conventions and with a network of local NGOs and associations to realize the different actions at the local level. The outcome expected is to improve living conditions of the local communities and possibly, by in order to prevent illegal migration.

Another project started recently in the same area and going in the same direction is the **Hadii Yahde** Project – Energy to Stay in the local Phulaar language. Promoted by the Italian Agency for Development Cooperation (AICS) of the Ministry of Foreign Affairs, is targeting a total of 2.106 people (of which 1.887 women) in five villages along the Senegal River in the Matam region to help reducing the high rate of illegal migration in the country. Harsh living conditions, poverty, malnutrition, the lack of education and of opportunities have pushed many to seek a better existence abroad making the region one with the highest proportion of emigration in Senegal.

The initiative, implemented by the Green Cross Italia aims in nine months to strength the resilience of fragile communities through the introduction of sustainable agricultural systems (i.e. crops rotation). A total budget of 560.000 \$ financed directly by Green Cross Italy, AICS and a network of both Italian and Senegalese associations, is invested to improve quality of life of small farmers by ensuring access to water resources and by enhancing the sustainable production capacity of territories by introducing water and energy saving innovations and small photovoltaic systems. These actions are thought also to reduce gender inequalities and increase the use of local labour to prevent inhabitants illegal emigration. In particular, the hope is that by boosting crops production women farmers will be able to hire men for field work that in this way they will not be forced to emigrate and face the dangers of the trip to Europe. It has been calculated that about 15.000 inhabitants of these villages will benefit indirectly from these actions that will also help to reduce climate change impact on the area.

### DiaMaSe project

Foreign organizations are not the only actors trying to improve Senegal living conditions. Migrants from Senegal are continually supporting their families and parents they left in their home country by sending home considerable amounts of money. As a matter of fact, globally the migrants' remittances to their home country have passed from \$ 296 billions in 2007 to \$ 445 billions in 2016 and about 40% of those are directed to rural areas. In Senegal, these donations represent 13,9% of the total GDP of the country. The project DiaMaSe promoted by Slow Food in cooperation with Oxfam and supported by the International Fund for Agricultural Development, wants to facilitate and organize these remittances by activating the diaspora in Italy to support rural development in Senegal and Morocco.

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CASE STUDY:

# MIGRATION FLOWS MANAGEMENT FOR TEMPORARY AGRICULTURAL WORKERS BETWEEN SPAIN AND MOROCCO THROUGH A DATA-DRIVEN INTEGRATED INITIATIVE



**Location:** Andalusia, Southern Spain, involving migrants from Morocco

**Organizations:** *Fundación para Trabajadores Extranjeros en Huelva (FUTEH)*  
Foundation for Foreign Workers in Huelva

**Projects:** MARES II

In Spain, migrants have increasingly been taking a larger role as seasonal agricultural workers. The agriculture sector has specific human resources needs that fluctuate according to the different cropping phases, which vary from crop to crop, and require a flexible workforce to meet its productive needs. Foreign workers, both legal and illegal, have been supplying such employment demands to Spanish agro-businesses, yet many issues have

risen in recent years in regards to farm labourers' employment and living conditions.

The Mares II project has implemented an innovative approach to promote the integration of immigrants and the management of diversity in agricultural enterprises in Southern Spain, with the aim to promote better coexistence and labor relations between foreign workers, businesses and the

## The Circular migration model

Temporary workers are contracted for agricultural campaigns directly from their country of origin on a yearly basis and for determined periods. Those workers are granted permits, while ensuring they can return to their home nation. Intended results include disincentivizing un-regulated economic migration, ensuring employees are granted work conditions as per the law, and the possibility to return to the same farms, enhancing human resources effectiveness

surrounding population. Its objectives integrate a “circular migration” model with improvements on the hiring Information Management System –including a biometric visa card for workers, while promoting a protocol of good practices and certification for the enterprises that are socially responsible with foreign labourers.

Its approach includes implementing a computerized system using bio-data to control workers hired in Morocco to perform agricultural labour in provinces of Andalusia, based on the digital verification of their fingerprints. The project fulfils multiple purposes, including flexible and streamlined hiring procedures at country of origin, and recording labourers' digitalised profile on their legal situation and work experience for targeted selection by employee's.

Santiago Lepe, the President of Foundation for Foreign Workers in Huelva (FUTEH) and leading implementation agency, states that the biometric cards “will avoid bureaucratic expenses and paperwork, as well as the frauds that usually occur with the current visa system”. In 2013, the innovative system registered 200 female workers who come for the strawberry season annually, and planned to identify 1,500 by the end of that year –out of the 5,300 temporary agricultural labourers hired through this model in Huelva province.

Another project objective focuses on the control of the working conditions of workers during their stay in Spain, for which a pilot programme has been developed with the collaboration of six agricultural companies from Huelva interested to be socially responsible, assessing for the compliance on

worker's occupational safety, health measures, and accommodation provided to them.

Mares II has been conceived as the continuation of the AENEAS-Cartaya project, where the “circular migration” model started in that province, and part of the EU financed projects aimed at managing migratory flows from third-party States. With a budget of 1.5 million euros and 2 years of duration, Mares II has been co-financed under the Border-Foreigner Border Cooperation Program (POCTEFEX), an initiative from the European Regional Development Funds (ERDF). Multiple stakeholders have been engaged in its implementation, including two foundations, various regional Government ministries, and the National Employment Agency from Morocco, showcasing the importance of collaborative approaches to manage complex transnational flows of migrants effectively.

This initiative was particularly timely, as in 2011 there were grave reporting of appalling working conditions experienced by migrant workers in Almería, another Andalusian province with intensive agricultural production. Almería is home to the so-called “sea of plastic”, with an estimated 40,000 hectares of greenhouses –the largest concentration in the world and visible from space, where 2.7 million tones of produce were grown in 2012, with a value of 1.2 billion euros each year, to satisfy Europe's fresh produce needs year-round. Authorities in Almería have reported an interest to implement FUTEH's model, particularly the best-practice protocol and certification for enterprises that ensure a socially responsible treatment of foreign workforce.



### Other integrative approaches to migration

Since 2008 several secondary schools in Barcelona province offer a course to integrate migrants' descendants and harmonize relationships among students.

The workshop "Cooking and Immigration" aims to spread the multicultural influences of contemporary cuisine by using ingredients and recipes from each continent and providing skills and pathways linked to the labour market, while incentivizing students to complete compulsory education. This school curriculum diversification initiative is presented as a public-private partnership, with students going to a commercial kitchen on a weekly basis to acquire habits, attitudes and values which enable their adaptation and integration into the social, educational and labour domains. Cooking is used as a platform from which to teach other subjects and learn multiple basic skills, including maths, natural and social sciences, ICT, linguistics, citizenship and ethics.

In Spain, 21% of employed agriculture workers in 2013 were from a foreign nationality (13% from third-countries and 8% from other EU nations). Moroccan nationals have the second highest proportion of employed foreign agriculture workers, with 26%, after Rumanians (29%). Andalusia is the region with the most foreign agricultural employees, representing 31% or over 55.550 people of the total migrant population in Spain. The seasonality of agricultural work in this region is 83%, the highest in Spain.

The European Parliament approved in 2014 the Directive 2010/0210 to establish legal guarantees for temporary workers coming from outside the European Union, where norms ensure dignified housing and same working rights as European citizens. The European Commission estimates that

100.000 third-country seasonal workers enter the EU every year to work in sectors such as tourism or agriculture.

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## CASE STUDY:

# COLLECTIVE AGRICULTURE TO INTEGRATE AND ENABLE ASYLUM SEEKERS INTERACT WITH SOCIETY AND ORGANIC AGRICULTURE

**Location:** Rovereto, Northern Italy, involving asylum seekers

**Organizations:** *Comun'Orto & its network of associations*

**Projects:** COMUN'ORTO



The short path to Gandhi garden already gave us a hint that we were headed to a special place. Flanked by elderflower trees, blackberries and red berries bushes it suddenly leads in front of a synergicist raised bed built during one of the last Comun'orto workshops. Tomatoes grown alongside with beans and salad in the middle of well-stacked mulch. Finally, by passing through a small fence it is possible to enter into what is the core of Gandhi garden, one of the two gardens

of Comun'orto: small plants everywhere ready to be transplanted, several beehives, a wide collection of medical herbs, an insect hotel, two small toolhouses, and of course, different raised beds with every type of vegetables included –old local varieties like Teresa salad and Aldeno's cucumber. Not to mention the spacious arena devised to gather and relax at the end of a hard gardening session and where many social events take place.

“I like to call it an agroecological and synergic garden” says Carlo, the coordinator of Comun’orto. Comun’orto is a project born in February 2016 from the initiative of 9 different associations<sup>1</sup> together with the municipal administration of Rovereto and financed through the grant *Intrecci Possibili*<sup>2</sup>. In two different spaces of the Brione neighborhood in Rovereto (Gandhi and Driopozzo gardens) with a total of about 500 m2 of gardens, it was decided to start an “approach to urban and organic agriculture in order to learn how to grow vegetables in a sustainable and collective way” explains Carlo. One of the main reasons why this project was born is to offer an alternative type of arrival to asylum seekers, who in Rovereto amount to about 350. Comun’orto – managed by Carlo together with a core team of about 15 volunteers and an extra group of about other 30 volunteers of all different ages – hosts and offers internships as a form of first welcoming to asylum seekers. In particular, five asylum seekers at a time are engaged twice a week in a two-month internship which aims to provide them with an introduction on how Italian working realities are, so as to introduce them to key aspects of European working standards. The project is one of the first responsibilities which asylum seekers receive when they arrive to Italy and it is a great opportunity to socialize and learn Italian with other volunteers, school students visiting the garden, as well as participate to many social events. The actual group, composed by five 22-year old young men from different northern Africa countries, has the chance to learn about practical principles of Italian plant biodiversity and organic agriculture while at the same time sharing their stories and their experiences with local citizens. Together with other volunteers, they also enjoy the results of their hard work by eating the tasty products they contributed to produce. As a collective garden, fruits and vegetables are shared based on the amount of working hours of

each participant, while a part of it is used in social dinners organized at the gardens. At the end of the internship and at the end of the path to integration, each asylum seeker receives a certificate.

“Comun’orto is not just a garden. It is also matter of attitudes” says Silvia, one of the Hotel Quercia operators, a company involved in the project and in charge of hosting asylum seekers mainly hailing from West Africa and Pakistan. “It is not for everyone and that’s why we try to select people who had some sort of agriculture experience in their home countries. In this way Comun’orto can become a path to link them back to their roots”.

And it is true: Comun’orto is much more than a common garden where everyone can help growing seasonal vegetables in a healthy and sustainable way which are then shared by the group. It is an aggregative place for the community where many different activities are organized for everyone: from concerts, to cooperation with school students from the adjacent Gandhi secondary school, to different workshops on how to transform food, to how to build an insect hotel. It is a unique place which allows to dream for a more sustainable and greener urban development, built together independently from age and origin.

#### NOTES

<sup>1</sup> Quartiere Solidale, Italia-Nicaragua, Punto d’Approdo, Brave New Alps, Associazione Shishu, Comitato Associazioni per la Pace e i Diritti Umani, GaSud, Gas La Sporta, Associazione Murialdo

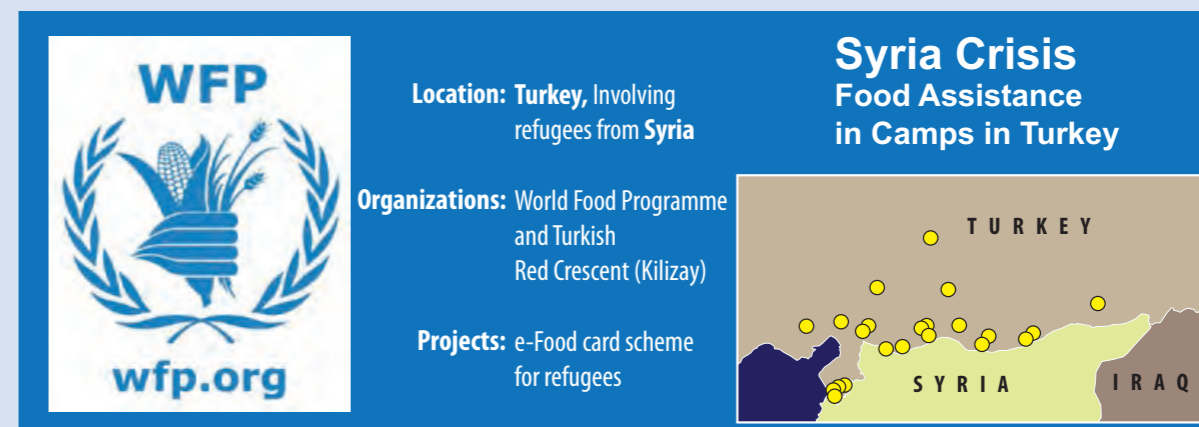
<sup>2</sup> Promoted by La Fondazione Trentina per il Volontariato Sociale and the Non Profit Network-CSV Trentino

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## CASE STUDY:

# E-FOOD CARDS OFFER CHOICE, CONVENIENCE AND NUTRITION SECURITY FOR SYRIAN FAMILIES AT TURKISH REFUGEE CAMPS AND SURROUNDINGS



**WFP**  
wfp.org

**Location:** Turkey, Involving refugees from Syria

**Organizations:** World Food Programme and Turkish Red Crescent (Kilizay)

**Projects:** e-Food card scheme for refugees

**Syria Crisis Food Assistance in Camps in Turkey**

TURKEY  
SYRIA  
IRAQ

In Turkey, over 150,000 Syrian refugees residents in 11 camps and around 90,000 living off-camps access an e-Food card to purchase nutritious food of their choice in designated shops and supermarkets. The programme was rolled out in 2012 in government-run camps, and as of June 2016, a quarter of a million Syrian refugees receive food assistance inside and outside camps. Envisioned as an innovative and efficient way of supporting refugee families, the

e-Food card is designed to purchase diverse and nutritious food items of their choosing.

This electronic card is similar to a debit card, with the total amount of assistance for the household loaded electronically onto the e-Food card twice a month. Such system was developed by the UN World Food Programme (WFP) and implemented by the Turkish Red Crescent (Kilizay), enabling refugee

families to shop and select their ingredients instead of receiving the traditional food aid packages of standard composition. The e-Food card works in stores selected by WFP, Kizilay and the Government, which ensures sufficient quantities of nutritious and fresh foods are available for purchase at competitive market prices. Retailers are located in the camp and in nearby urban areas, which have a contract with Kizilay to ensure compliance with the programme regulations and quality standards.

Not only convenient for families to eat meals that resemble the ones they cooked in Syria, the e-Food card scheme also ensures the nutritional value of the refugees' diet. Fresh produce can be bought, normally not included in traditional food rations, while unhealthy products like sweets, alcohol and cigarettes cannot be purchased with the electronic card. In 2016, each family member received in their e-Food card 50 Turkish Lira per month, around 18 euros. This amount is in line with the WFP referential cost of a food-basket providing 2100 calories daily, estimated at 62 Turkish Lira. WFP's monitoring and evaluation mechanism shows that the dietary diversity levels of beneficiaries are high – a strong indicator of nutritional status, reflecting how the programme is enabling the consumption of a nutritious diet through the purchase of basic items in the established food basket.

In Malatya camp, one of the 26 Government-run camps in Turkey, nearly 8,000 people live in small container shelters. Amina Akkud, a mother of five

who lives in the camp, holds the responsibility to ensure all four of their children go to school and eat healthy food since her husband is living abroad. She worries about her 20-year-old daughter, Shahad, who stayed back in Syria with her husband and baby. "Because of the conditions in Syria, my daughter is only able to eat meat once a month if she is lucky. Here we eat meat twice a week, thanks to the World Food Programme e-card." Women serve an important role in the camp, with many heading their households as the ongoing conflict in Syria has separated countless families and claimed even more lives.

The e-Food system provides the opportunity to purchase families' favourite foods and cook healthy meals in their shelter or home, improving the convenience over hot meals delivery. Importantly, the e-Food cards seem to increase women's control within households in meeting food needs and meal coordination, as they can be fully involved in the selection of food for their families. Consuming meals that are familiar is of high value in such prolonged distressful situations, where eating foods to which refugees are culturally connected to can provide some sense of relatedness and relief stress. Ultimately, a stable source of food generates a level of normality that is of immense emotional support to refugee families.

Kahramanmaraş is another of Turkey's refugee camps, mostly with Syrians residents. Four years ago refugees like Salwa started receiving e-Food cards. "With the card we are better off. Before we used

to receive hot meals but many times my children couldn't eat them. The card is easier, I can buy what I like and cook what my family likes our way. I come 5 times a week and I spend between 100-125 liras", around 30-40 euros, says Salwa. This programme brings a degree of independence to Salwa's life and the dignity of choosing her own food.

A 40 million euro contribution by the European Union's (EU) Humanitarian Aid Operations in March 2016 has allowed the programme's expansion to reach most vulnerable families living outside camps, where 2.3 million Syrian reside, and raising the amount of people eventually targeted to 735,000. The vast majority of Syrian refugees, 90% according to the European Commission, live outside camps in urban and rural areas and are often unaccounted for. Their identification is an enormous job and field monitors report that almost one third of Syrian households living off-camp are food insecure.

The programme success is well demonstrated by the high satisfaction of beneficiaries – who prefer choosing and cooking their own food rather than eating from provided hot meals, as well as by its benefits to the local economy. Local communities are impacted directly as beneficiaries spend their food entitlement at shops and supermarkets that are owned and managed by local retailers, supporting better integration between the Turkish society and Syrian refugees. For off-camp beneficiaries, the programme partners have assessed and contracted commercial food markets to participate in the

e-Food card scheme, while also aiming to foster greater market competition and ensure the quality of foodstuff at lower prices. Moreover, the scheme allows for over 70% savings when compared to the hot meals provision, while eliminating food waste generated during their distribution.

The war in Syria has forced millions to flee their homes. Since April 2011, many have crossed to Turkish due to sharing a 900km border with the war-inflicted country. Six years after the humanitarian crisis started, almost five million people are registered as refugees in neighbouring countries while six and a half million are internally displaced within Syria. Turkey now shelters the largest refugee population in the world with over 3.1 million, 2.7 of which are Syrian.

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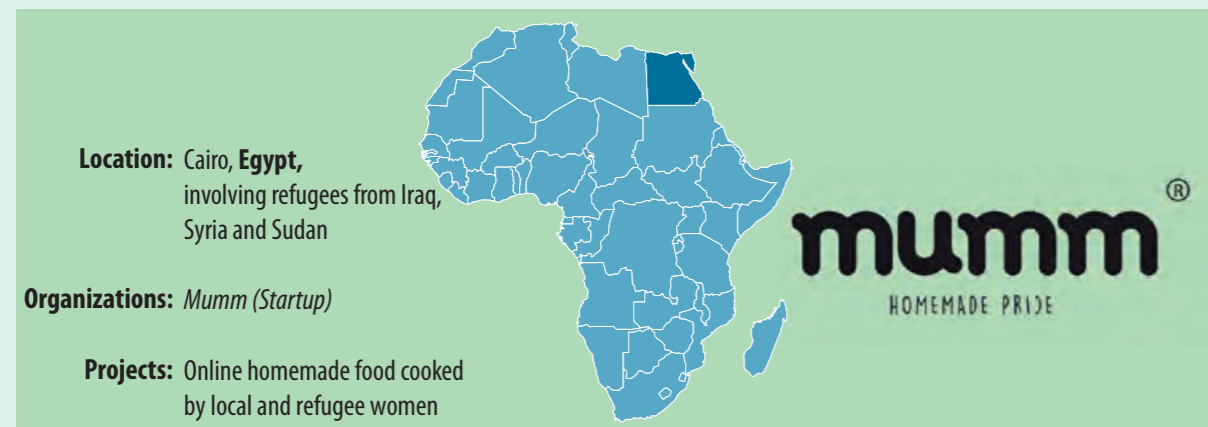
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#### A context-based solution

The launch of the WFP-Kizilay e-Food card scheme in Turkey was the first example of an electronic voucher system being used at the outset of an emergency response. Keys to its success include: the Turkish Government has high capacity; the Emergency Management unit established camps, provided cooking facilities and commercial food markets; Turkey's agriculture and commercial food sector is strong; the electronic banking system is robust and well-established; and a synergistic partnership between the Government, Kizilay's experience in emergency response and WFP's expertise in e-voucher programming. These conditions enabled the transition from the initial in-kind food assistance, more common in refugee settings, to a market-based approach with the provision of e-vouchers.

## CASE STUDY:

# MUMM THE EGYPTIAN STARTUP THAT DELIVERS MEALS COOKED BY REFUGEES



Mumm is an online Egyptian platform which connects home-based cooks called “Food Partners” with nearby customers looking for healthy, affordable and nutritious meals delivered to their doorstep. The startup also recruits Syrian, Iraqi and Sudanese refugees and trains them to become Food Partners through a partnership with the Fard Foundation, a Cairo-based NGO. By matching home cooks to the market, Mumm provides a means for

local women and refugees to make a living with their cooking skills and delicious traditional recipes.

This innovative web-based business is providing Egyptian women with a way to achieve financial independence in a county where 25.5% of them are unemployed, while also supporting refugee families to earn much needed income. Registered asylum seekers and refugees in Egypt come mostly

from Syria, totalling 71%, while there are also over 26,000 Sudanese and almost 7,000 Iraqis. Through the cooperation with the Fard Foundation, many refugees are finding a way to support their families, such as for Iman Omanein, who now cooks the typical food she used to make before fleeing to Egypt to escape the war. “As a Syrian woman married for 23 years, of course I know how to cook”. Iman undertook a free cooking course with Mumm which also focuses on food quality and safety, and then became a Food Partner.

An essential component of Mumm is the fact that Food Partners, mostly women, cook in their own kitchens while the company takes care of marketing and delivery. Web users order by first entering their location and then choosing from the meals currently being offered in their nearby areas by selecting among attractive photos of home cooked meals. Choice includes single portions, family meals and even frozen rations, a service currently available in many neighbourhoods of Cairo city and its surroundings. Meals are delivered to customers’ location, which save around 20% for similar dishes found in restaurants. Cooks earn an average of 6,000 Egyptian pounds or 300 euros a month, according to the company’s estimates, which Iman uses to sustain her household.

The benefits of this entrepreneurial concept are multiple as Waleed Abd El Rahman, co-founder and CEO of Mumm, explained in an interview in 2016. “There are a number of areas where Mumm positively affects society: We provide home cooks the opportunity to work, we work with refugees in

order to provide them with job opportunities and we provide healthy, nutritious food to help combat the issue of obesity.” It also helps women achieve some economic independence by linking them to the local economy, as Mumm provides “women the opportunity to create a sustainable livelihood for themselves, from the convenience of their homes, while insuring they are equipped with the right tools to deliver quality, safe and tasty food”. Providing means to economic independence and employment security is a valuable outcome in a society which generally confine women their private sphere.

The Homemade food tech startup was recognised earlier this year by the World Economic Forum (WEF) and the International Finance Corporation as one of the 100 top startups in North Africa and the Middle East which uses digital technologies to promote social change. Last August, Mumm also secured a US \$200,000 investment from 500 Startups, a US-based accelerator and fund, which the Egyptian online company will use to increase its user base and grow its team. Sharif El-Badawi, partner at 500 Startups, said “Not only do we believe that Mumm will help corporate employees eat healthier and be more productive, we are keen on empowering women and providing a means to independence and job security for them”.

Homemade meals also tend to be prepared with much more care and love than those from food retailers, bringing an added value to the service. Dishes are cooked on demand while using fresh ingredients, which is helping to promote an appetite for healthy food among consumers in Cairo. The

### Ensuring quality and safety of home made meals

A crucial component for the success of the Mumm concept is to deliver quality and safe food to its customers. The company has established thorough processes to ensure that delivered food meets hygienic standards. During the induction course Mumm’s teams inspect the kitchen of the new Food Partner, and continue to inspect the cooking facilities every two weeks as well as doing spot checks. Additionally, users can write reviews in their website and provide public feedback on that particular dish, while also reading feedback by other customers.

Egyptian cooking start-up is helping refugee women not only by providing them meaningful employment, but also by exposing customers to the more varied Syrian cuisine.

It seems that Mumm entered the market space at the right time and place, beginning to deliver meals from 6 October in 2016. In 2013 an article by The Guardian explains how this satellite town close to the country's capital saw a huge increase in the number of Syrian restaurants and delis since the conflict forced many to escape. Numerous refugees well integrated in this town and opened restaurants and groceries stores, as with the Syrians came their food. "When we first opened, Egyptians would come in out of charity," Abdoul Kheir recalls, a Syrian deli owner. "But then they noticed the difference in quality and they starting coming back because they were addicted to it. Now I've got more Egyptian customers than Syrian." Within a short period, Egyptians got a taste for the refugees' food – a source

of pride among the Syrian community, that now Mumm is cleverly capitalizing on.

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CASE STUDY:

# REFOODGEES

## OVERTURNING THE VICTIM ROLE OF ASYLUM SEEKERS BY EMPOWERING THEM THROUGH FOOD



**Location:** Köln - Dusseldorf, (Northern Germany) involving asylum seekers from Syria (mainly)

**Organizations:** Refoodgees

**GERMANY**  
○ Köln (Colonia)

**REFOODGEES**  
KOCHEN ÜBER DEN TELLERRAND

According to a survey by the Organization for Economic Cooperation and Development, Germany is the second most popular migration destination in the world after the United States. It is estimated that about 11 million of the people currently living in Germany were actually born elsewhere, meaning that over one in eight members of the German population is an immigrant. Since the 1960s, Germany has been one of Europe's major

migrant destinations but, with the beginning of the recent refugee crisis in 2015, more than a million of asylum seekers from outside EU have arrived in the country. During such a crisis, it has been calculated that German states spent around €23 billions on refugees in 2016 to be able to welcome them all. Because Germany is federally organised and migrants are distributed very heterogeneously, a vast variety of different initiatives can be found at

a regional (Land) and local level to promote their integration.

In Koln (North Rhine-Westphalia) the refugee population more than doubled in just two years passing from 5.141 asylum seekers in December 2014 to 13.253 in December 2016 mainly coming from Syria and Iran. The city has one really good example of the pro-active German attitude in welcoming and making migrants an active part of what is the most powerful EU economy: the project REFOODGEES. Started in 2015 by Christian and his girlfriend, REFOODGEES tries to empower immigrants through something which is essential to all humans: food. It all started as a cooking group gathering every two weeks to cook and share with migrants. More than 40 people, half of whom from Germany and the other half made up of asylum seekers, mostly Syrians but also Nigerians and Kurds, are still participating to these dinners while in the meantime the project has gradually grown as much as to morphing into a start-up.

The group actively involved in the start-up is smaller and made up of about 15 people; of those, half are Germans and the other half are asylum seekers. They mainly carry out two activities: organize or participate to cooking events around Germany and offer an excellent catering service. The catering service they provide has not to be thought as a normal restaurant service: its aim is to connect people and therefore the events are very interactive. During these evening in Koln and Dusseldorf the chefs have the opportunity to meet with clients, to introduce themselves and to tell their stories.

In 2015, the start-up received a considerable private donation which was used to buy a van which was immediately transformed into a professional food truck. With the truck, the group traveled to many different food festivals around Germany, spreading their exotic food and their new idea of integration. Street food festivals represent a unique opportunity for the people who otherwise would not be in touch

with refugees. In general, the public warmly received the project: yummy food seems the best way to overcome their initial distrust toward immigrants and to make people more willing to listen to asylum seekers' stories.

“What it is important of our project” says Christian “is what happens to our chefs. Migrants, especially asylum seekers usually feel as victims in their new countries and feel like they have to be grateful to everybody. With food their role gets reversed since they are able to produce something for what people thank them. This is what I think changes the minds of both Germans and people who arrive in the country”. Moreover, while cooking and meeting the German society, asylum seekers have a great chance to learn the language. Christian remembers that at the beginning most of them did not know any word of German and they used to mainly communicate in English or by using their hands. Now, thanks to their experience and to the language courses they enrolled in, you can sometime hear them correcting Germans while at the same time teaching some words in Arabic.

All of the participants at the project are volunteers since all the profits made during the events are used to fund their own project or to support other initiatives aimed at helping migrants. For example, they work with the Refugees Foundation and their project support refugees on the run, which guarantees other refugee camps outside of Germany any kind of support, from supplies to tents, to toys for the many children living in the camps.

For their own project they are investing in providing the group with everything necessary and Christian is now looking for a chance to participate weekly at the Koln food market in order to be able to pursue its project through food. Moreover, the start-up is now providing two of the chefs with a driving license, with the aim to make the group more independent. And that's exactly the future goal of this initiative: making asylum seekers more autonomous by trusting them and giving them back their dignity.

### The Refugee Food Festival

The Refugee Food Festival is a European itinerant event born in 2016 in Paris where city restaurants opened their kitchens to refugee chefs. Thanks to the universal power of food, the festival has three main goals: changing perceptions of refugees, accelerating their professional integration, and discovering cuisines from all over the world. Thanks to the great success of the first edition and to work of the two associations (Food Sweet Food and the UNJCR) in developing a toolkit to export the festival, 13 European cities replicated the initiative in 2017. More than 50 restaurants opened their kitchen to refugees' chefs from all over the world.

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## RECOMMENDATIONS

This study underlines that migrations flows from Africa to Europe (South-North migration through the Mediterranean Sea) are part of a structural challenge driven by a series of factors: geopolitical, demographic, environmental, and economic.

*Food and nutrition are relevant in all the Sustainable Development Goals and they are connected to all main factors driving migration, both in terms of food security and through the strong link between nutrition and human capital.*

In the analysis of food and migration, three keywords are particularly relevant.

*The first keyword is interdependence.* In order to study migration and food, one has to necessarily focus on the existing *links between different regions and different cultures*, with regard to development, mutual understanding, risks and opportunities.

*The second keyword is paradox.* There are several paradoxes concerning migration and food to be investigated, while also taking into account the role of *FVCs and innovation* in order to be lever for local development and to overcome food losses, through the *cooperation between producers, processors and distributors*.

*The third keyword is uncertainty.* When it comes to demographics and climate change, scenarios and trends tend to vary greatly, that is why *any viable decision making process should necessarily comprise uncertainty treatments*.

Against this context, it is essential to stimulate further research on migration and food security, and to build on the increasing scientific and public policy awareness for further public action. It is also necessary to raise awareness on the *“migration-food nexus”*, reaching out to all stakeholders

(Governments, international organizations, NGOs, research centres, think tanks) involved in migration policies, with a specific emphasis on *local authorities*.

Specific recommendations on the “migration-food nexus” include the following:

1. **Migration is a structural phenomenon related to structural trends.** In the medium-long term, it is key to invest in the economic and human development of countries of origin, through measures such as an “anti-land seizing” policy, investment in education, research and innovation, as well as the *development of sustainable agro-food supply chains*. Existing financial tools, both public and private, can be employed in a comprehensive development program. However, *differentiation* is key. On the one hand, migration issues cannot be dealt just through migration policies. On the other hand, one-size-fits-all policies would not be able to tackle hunger in countries of origin. Starting from the African major players we have identified, it is key to elaborate *country-specific strategies*, taking account of internal differences.
2. **A real partnership approach is needed.** Any concerted action should start through real *ownership by African countries*, and through reinforcement of the role of the African Union (building on the Agenda 2063 of the African Union Commission). Specifically, South-North migration flows should not be considered as a solely European issue – truly global awareness is required. Therefore, a global approach to South-North migration throughout the Mediterranean should involve *the main relevant geopolitical players* of the area, such as the United States, China and the Gulf countries, given their leverage on cooperation on climate change and their

influence on countries of origin of migrants. International cooperation in these areas should take account the *2030 Agenda for Sustainable Development*.

3. Following Germany’s “Marshall Plan with Africa”, *food and agriculture need to be considered together as one of the key pillars of a new partnership with Africa*, in all initiatives aiming for sustainable development in an area stretching from the Middle East to the Gulf of Guinea. In order to help Africa feed itself by mid-century, specific chapters on agriculture (including innovation in agriculture, technology and access to finance), food and nutrition are needed in all policies established by the EU, but also in all Migration Compacts with the countries of origin of migrants, which must emphasize *the role of food chains as networks of interdependence*. Specific initiatives could include: limiting food loss and waste, enhancing networks of distribution and refrigeration, promoting multi-stakeholder initiatives by food producers, processors and distributors for youth employment and rural development, monitoring and launching joint research and innovation programs.
4. In formulating and implementing climate change adaptation measures, *both synergies and trade-offs with environmental impacts and climate mitigation cannot be neglected*. The share of agricultural goods devoted to livestock feeding and bioenergy production is already large and potentially rising, with the aim of nourishing an increasing number of people and meeting the targets of climate mitigation, respectively. While this has strong ecological consequences (land and water consumption, greenhouse gas emissions from cultivations, deforestation) and thus calls for consideration of diet shifts and of an environmental-friendly crop farming, the effective sustainability of agricultural production

under climate change, if adaptation is not implemented, has to be evaluated. In this context, moving the focus to a smaller spatial extent will allow addressing the large internal heterogeneity of countries, which makes the interior migration not trivial, especially in case of short-term displacements due to more localized extreme events such as floods. Finally, the consideration of *alternative borders* (e.g. watersheds, agro-ecological zones), rather than administrative ones, can enable the consideration of trans-boundary issues and conflicts, like downstream/upstream competition for water resources and rural/urban share for ecosystem services.

5. **Remittances** are important in connecting individual savings of migrants and development of the countries of origin and *can play a role as enablers of sustainable development*. Through leverage schemes by EU and African national promotional institutions and other entities, remittances flows, while continuing to sustain families in countries of origin, should also support specific projects on agricultural development.
6. It is necessary to *raise awareness of illegal exploitation of agricultural labor*. EU directives and initiatives in this field, also in line with the *20 principles of the European Pillar of Social Rights*, should be fully supported and implemented by Member States, through appropriate initiatives on monitoring and enforcement. Moreover, the contribution of all the actors of the supply line is crucial to guarantee that new, subtler forms of exploitation do not resurface under the pressure of market constraints.
7. **A key nexus between demography and economic development is the empowerment of women.** Therefore, the role of women should be at the centre of any strategy of co-development and sustainable development.

Further collaboration is needed to bring higher technical training to women farmers, and further exchange of best practices should aim to *empower women as entrepreneurs, scholars and leaders*.

8. **A research agenda on the “migration-food nexus” in countries of destination is needed. Food has a huge and unexplored potential for integration, by acting as a factor of inclusion.** For countries of destination, migration policies should not be limited to services in hosting migrants.<sup>1</sup> Any national strategy on migration in EU countries should also involve integration policies which require linguistic and cultural investments, and also projects on vocational training. In all of these areas, food and nutrition require specific attention. It is also important to *monitor the impact of different initiatives currently in place to foster integration through food by gathering relevant data and boosting knowledge sharing among different stakeholders*.
9. **The development of sustainable, integrated, profitable and entrepreneurial agrofood value chains in the Mediterranean can play a major role in order to stabilize migration flows by improving food security, rural development and smallholder livelihoods.** The establishment of collaborative partnerships between all players in food value chains, as well as across different countries in the Mediterranean, is essential to foster innovation in the agrofood sector and to implement the 2030 Agenda, also facilitating the exchange of knowledge and best practices.

#### NOTES

<sup>1</sup> Migration policies should consider more thoroughly the issue of distributing migrants – for instance, through the so-called “Königstein key” (the quota of asylum applicants calculated on an annual basis in Germany in relation to each Land, combining total tax revenues and population numbers).



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