



Designing indicators for monitoring the Food Sovereignty

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Abstract

Food sovereignty is a major concern, especially with the recent development of global food crises. Despite increasing relevance in recent years, several aspects remain under-explored. The concept itself is unclear due to the complexity of its meaning and the diversity of visions it can incorporate. There is a need to review the definition and develop a set of carefully selected indicators to describe food sovereignty in all its dimensions and enable the design of appropriate responses based on reliable information. Our analysis aims to understand how relevant and discretionary the choice of indicators can be to inform and monitor the development of food sovereignty in Africa. We will primarily use data published over the past decade by the Food and Agriculture Organization of the United Nations and the World Bank to identify indicators that provide information on the six dimensions of food sovereignty. We will dig deeper into the relationship between the different indicators and we will analyze the main associations and discrepancies at the level of a sample of 44 African countries, chosen mainly because of the availability of data

Keywords: Food sovereignty, agricultural, comparative analysis

JEL Classifications: C10, O13, O57, Q18

Introduction

The latest global economic crises of the Covid-19 pandemic and the war in Ukraine have shed new light on the role of agriculture and food sovereignty strategies, in a context of resurgence of fears of food shortages. Food risks that indicate difficulties for countries or individuals to access adequate and healthy food in a timely manner had increased. They manifested at the level of production because of the vagaries of the weather which had affected certain suppliers, at the level of the distribution and accessibility of food because of the continuous and significant surge in food prices and decisions to break exports because of the pandemic and the strengthening of geopolitical conflicts.

The search for food sovereignty has been reaffirmed with a self-determination of building an endogenous development model that allows countries to face food risks, reduce international interdependencies and develop production centered on national needs. It differs from food security, which aims to ensure a sufficient quantity of healthy food for each individual without insisting on the origin or the conditions of production of this food.

Food sovereignty retains an approach that provides practical solutions for local farmers and small farmers, who are often neglected in strategies for developing agricultural productivity. It involves the recognition of endogenous food systems rich in bio-cultural diversity and requires radical changes in four interrelated areas: ecological, political, social and economic. However, and although it has been conceptualized, its multidimensional nature still makes it difficult to quantify. Our ambition is therefore to identify the indicators that can be used to monitor some aspects of the food sovereignty situation.

¹ The views expressed in this article are the responsibility of the author and do not necessarily reflect the conclusions of the HCP.



This paper is divided into 3 parts. The first will focus on specifying the different aspects of food sovereignty. In the second part, we will present the indicators that should reflect the various dimensions of the food sovereignty. The interrelations between the food sovereignty dimensions and the interpretation grids will be the subject of the last part.

1. Food sovereignty framework

The initial definition of food sovereignty was first developed in 1996 by the Via Campesina movement and was taken up, modified and expanded at the Nyeleni Forum in 2007: “Food sovereignty is the right of peoples to a healthy, culturally sound food produced using sustainable and environmentally friendly methods, as well as their right to define their own food and agricultural systems. It places food producers, distributors and consumers at the heart of food systems and policies instead of the requirements of markets and transnational corporations. It defends the interests and the integration of the next generation... Food sovereignty gives priority to local and national economies and markets and gives precedence to peasant and family agriculture, traditional artisanal fishing, pastoral farming, as well as food production, distribution and consumption based on environmental, social and economic sustainability... Food sovereignty implies new social relations freed from all oppression and inequality between men and women, between peoples, racial groups, social classes and generations. »

Based on this definition, it is possible to retain the following 6 main pillars of food sovereignty:

- a. The right to sufficient, healthy and culturally respectful food for all individuals, populations and communities. Food sovereignty implies that the food needs are met before exporting food crops or that food crops are replaced by cash crops. A country is considered to be in a state of food sovereignty when it dominates its food supply in a way that allows it to cope with fluctuations in prices and international trade. The reduction of the undernourishment of its population is an obvious consequence. Providing enough food to a given population is a necessary but not sufficient condition for food sovereignty to ensure that people have adequate access to food.
- b- Promotion of products and practices and respect for the right of men and women, peasants and vulnerable categories, such as family farmers and artisanal fishermen to produce food. The protection policies that should be put in place to support such an option should be accompanied by an increase in the prices of food products. In some activities, surplus production does not find enough commercial outlets and post-harvest losses remain substantial. The evolution of agricultural prices is the main indicator that provides information on the valuation of agricultural products and practices. The integration of agriculture with the links in the agribusiness value chain is not desirable. In 2015, Nyeleni insisted on agroecology and the fight against inequalities as being “key elements in the construction of food sovereignty”. Agroecology is seen as a bottom-up path to food sovereignty based on knowledge systems, in which small-scale farmers, their communities and their organizations, and not the agri-food sector, play a key role.
- c- Establishment of local systems of production and resistance to institutions, agreements and practices that depend on the outside. Food sovereignty stands in opposition to the international trading system and supports local production systems. Autonomy is based on partnership and complementarity between production, farmers, agricultural regions and local actors. Different types of indicators can provide information on the evolution of local production systems, including the growth of agricultural production, crop yields, the food dependency rate, the weight of agricultural expenditure in the public budget, etc.
- d- Strengthening of local control and support for consultation and collective action between producers from different regions and territories. Establishing local production systems involves strengthening monitoring mechanisms. Control will reduce agricultural post-harvest losses and food waste and ensure that food imports are limited.



e- Construction of local knowledge and know-how of producers and their local organizations that preserve, develop and manage local production and crop systems. It allows the development of appropriate research programs that do not threaten future generations. This pillar focuses on local collective knowledge, more specifically on the question of their recognition and their promotion as a development path for family farming. Food sovereignty requires a general increase in the level of knowledge of all farmers and significant investment in agricultural research and extension.

f- Work with nature according to diversified and low-input Agri-ecological cultivation and production practices, which optimize the contributions of ecosystems, improve resilience and adaptation, particularly in the face of climate change. It includes the maintenance of cultivated and natural biodiversity, the management of inputs and soil fertility, the protection and quantitative and qualitative management of water resources, the management of pollution risks and the mitigation of climate change and the management of spaces and landscapes. The environmental issue is a structuring and cross-cutting element for regaining food sovereignty.

2. Measurement of food sovereignty

The 6 pillars of food sovereignty imply the exclusive power of countries over factors of production, in particular inputs, human capital, local and external outlets, ecological practices, agricultural production and imports, and food availability. All series presented in this section relate to the following African countries :South Africa, Algeria, Angola, Benign, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Comoros, Congo, Ivory Coast, Egypt, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea-Bissau, Kenya, Liberia, Libya, Madagascar, Malawi, Mali, Morocco, Mauritania, Mozambique, Namibia, Niger, Nigeria, Uganda, Rwanda, Senegal, Sierra Leone, Somalia, Singapore, Sudan, Chad, United Republic of Tanzania, Togo, Tunisia, Zambia, Zimbabwe.

The study was conducted over the period 2013-2020. The indicators used come from the Food and Agriculture Organization, the World Bank, the OECD and the United Nations statistical department. Figure 1 summarizes the set of indicators and specifies their source.

Figure 1: Main indicators of food sovereignty

Dimensions/ pillars	Indicators	Source
Food availability	- Average per capita food availability (kcal/person/day)	FAO
	- Adequacy of dietary intake	FAO
	- Prevalence of undernourishment	FAO
Local production and practices	- Food production index	WB
	- Cereal yield	WB
	- Rate of dependence on cereal imports	FAO
	- Agriculture orientation index for government expenditures	UN
	- Agriculture share of Government Expenditure (%)	UN
	- Number of local breed genetic resources	FAO
	- Substance cultures growth	WB
Valuation	- Agricultural prices	WB
	- Income of the small farmer	UN
Control and consultation	- Food price variability	FAO
	- Variability of food availability	FAO
	- Food Loss Index	NU
	- Share of food imports in total imports	FAO
Knowledge and skills	- Expenditure on agricultural research and development;	OCED
	- Agricultural employment	WB
Ecological production	- CO2 agricultural emissions	WB
	- Use of insecticides and pesticides	FAO

Source: Our calculation



Food availability

Food availability is equal to the sum of local food production, food imports and food aid, minus food exports. Over the last decade, food availability in Africa has increased faster, resulting in improved food sufficiency per person. Access to food has developed in particular in the countries of North Africa where undernourishment rates were below 10% during the period 2013-2021, compared to 16.5% on average in our sample.

Local practices and production

Agricultural production has increased at a sustained pace in Africa, particularly including over the 2013-2019 period, but its dynamics have not kept pace with population growth or the agricultural region's needs. Performances, particularly in cereals, improved significantly in Ethiopia, South Africa and Morocco, in line with the increase in public spending geared towards agriculture. Food production showed sustained growth in Senegal (+5.2%), Tanzania (+4.2%), Guinea (+4.9%). On the other hand, the countries of Zimbabwe, Tonga and Sierra Leone experienced a reduction in their food production.

Valuation

Agricultural prices are one of the basic instruments for assessing the agricultural revenues and ensuring the continuous development of agricultural production. In Africa, food prices have been rising all regions. However, the increase was greater in Angola, Sudan and Liberia, with food inflation rate of more than 5% on average.

Control and consultation

Control of the food supply is fundamental to the achievement of food sovereignty. The 3 levels of food supply control are: production, import and price. Controlling the supply will make it possible to stabilize food availability and monitor the evolution of imports. Since 2013, the variability of food availability has been significant in Africa except in the northern and western countries where relative stability was recorded during the 2013-2020 period.

Knowledge and skills

Due to the unavailability of indicators, it is difficult to carry out here an in-depth and exhaustive analysis of the transmission of agricultural knowledge and know-how within Africa. Agricultural employment, research expenditure and the number of farmers affiliated to professional groups are indicators with different scope, but provide partial information on the construction and dissemination of agricultural knowledge and know-how. For African countries, agriculture remains one of the main providers of employment, with a share of agricultural workers in the employed working population amounting to 80% for Somalia and 73% for Mozambique.

Ecological production

The use of phytosanitary products, in particular pesticides and insecticides, is still underdeveloped in Africa, with the exception of certain countries where agricultural production has experienced significant growth over the last decade. Agricultural carbon emissions are low, especially in Gabon, Togo and Rwanda.

3. Links between indicators

In this section, we examine the links between the indicators by exploring the correlation matrix (Figure 2). The question studied aims to explore the potential for achieving the 6 or 5 dimensions of food sovereignty.



Figure: Correlation matrix

	Food price	Food production	Dependance cereal	CO2 agr Emissions	Agriculture employment	Insecticides use	Food imports (% of merchandise imports)	Agriculture orientation index for government expenditure	Agriculture share of Government Expenditure (%)	Pesticides use	Plant genetic resources accessions stored ex	cereal yield	Prevalence of undernourishment (19-21)	Adequacy of dietary intake	Variability in per capita food availability
Food production	0.24														
Dependance cereal	-0.18	-0.18													
CO2 agr Emissions	-0.35	-0.24	-0.42												
Agriculture employment	0.18	0.18	-0.06	0.43											
Insecticides use	-0.62	-0.49	0.14	-0.02	-0.24										
Food imports (% of merchandise imports)	0.38	0.52	-0.82	0.13	0.68	-0.33									
Agriculture orientation index for government expenditure	0.03	-0.04	0.68	-0.74	-0.52	0.11	-0.54								
Agriculture share of Government Expenditure (%)	0.06	0.35	-0.33	-0.28	0.46	-0.07	0.30	0.41							
Pesticides use	-0.56	-0.55	0.11	0.07	-0.38	0.90	-0.34	-0.08	-0.35						
Plant genetic resources accessions	-0.81	-0.44	0.21	0.33	-0.02	0.69	-0.56	0.06	-0.03	0.52					
cereal yield	-0.43	-0.34	0.04	0.23	-0.34	0.41	0.05	-0.34	-0.34	0.58	0.06				
Prevalence of undernourishment (19-21)	0.49	0.02	-0.25	0.12	0.60	-0.52	0.28	-0.18	0.06	-0.67	-0.17	-0.40			
Adequacy of dietary intake	-0.53	-0.25	0.22	-0.17	-0.56	0.85	-0.32	0.26	0.00	0.74	0.22	0.48	-0.94		
Variability in per capita food availability	-0.47	0.36	0.41	-0.41	-0.44	0.16	-0.34	0.60	0.43	0.08	0.22	-0.12	-0.63	0.58	
Substance cultures growth	0.21	0.84	-0.45	-0.33	0.31	-0.27	0.63	-0.15	0.41	-0.27	-0.40	-0.24	-0.06	-0.06	0.31

Local production and prevalence of undernourishment

Food production in African countries has increased significantly, but is not yet sufficient to reduce undernourishment or the variation in food availability within African countries. Undernourishment is positively linked to the Adequacy of dietary intake, which depends heavily on the effort made by public authorities in terms of agricultural expenditures. The improvement of food crops promotes the development of food production.

Local production and sustainability indicators

Methane emissions in agriculture do not yet accompany the development of food production in African countries. This is partly due to the sources of growth in agricultural production, mainly plant-based, which generate less methane gas compared to animal production.

The rise in insecticides and pesticides is having a negative impact on undernourishment in African countries. Otherwise and despite their undeniable effects on the sustainability of the agricultural system, the use of insecticides and pesticides promotes adequacy of dietary intake in Africa and has no effect on the development of food crops.

Food dependency and food production

Increasing food production is a necessary but not sufficient condition for reducing food dependency. The results show, however, that for many African countries the increase in food production has not affected their food dependence, because food needs are still very high or because this increase has been more favorable to exported crops. Food production is thus not geared towards local food preferences and systems.

Food dependency and agricultural know-how

Food dependence penalizes food sovereignty and imposes the implementation of strategies to increase local agricultural and agri-food production. This increase would be based on an increase in the factors of production (capital, land, water and labor). Agricultural employment is negatively related to food dependency. This is how less food dependence has been recorded in countries where agricultural employment constitutes a non-negligible part of the employed working population.



Conclusion

In this paper, we have identified 15 indicators that can help us to monitor the sovereignty food state of African countries. However, it should be noted that the concept of food sovereignty, very widely used in the post-Covid crisis, represents a more complex and complementary multidimensional approach to food security. The studies surveyed, despite their heterogeneity, show that all the factors significantly linked to food sovereignty overlap to a large extent with the indicators of food self-sufficiency. The path to food sovereignty goes through increasing the production and yields of local products. However, this increase should be aligned in priority with the preferences of the population both in terms of food quantity and quality. Requirements in terms of health, environment and territory tend to increase more and more. The decades that follow could be those of a transition towards an agriculture that responds to collective preferences as a priority in a context of the emergence of new production techniques based on artificial intelligence

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