Menu

The trend towards sustainable food systems calls for a change in scientific research rationale

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This is a guest blog from Nicolas Bricas, Director of the UNESCO World Food Systems Chair. Nicolas is a co-investigator with Prof. Michelle Holdsworth. Dr Rebecca Pradeilles and Dr.Paula Griffiths on a SIID-funded research project on changing urban diets in Africa.

Food issues have become complex in the sustainable development setting. Food no longer solely has to meet our biological needs, give us pleasure, contribute to social interactions and build our identities—the way we feed ourselves and how our foods are produced, processed and marketed have a high impact on the viability and future of the planet. The NGO GRAIN (2015) considers that around half of global greenhouse gas emissions are due to land-use changes closely associated with agricultural development, agricultural production and the series of operations that generate cooked foods from agricultural raw materials and then convey them to consumers. In terms of biodiversity loss, intensive agriculture also has a heavy impact in terms of nitrogen and pesticide pollution, predation on fossil resources, such as mined phosphorus, etc. The global adoption of food systems mirroring those of industrialized countries has given rise—as we all know—to a serious problem of sustainability. Global resources will not suffice. A shift towards more ecological and environment-friendly systems is essential to cope with these issues.

This transition cannot be based solely on environmental criteria. Inequalities generated by the prevailing economic system are currently so substantial that they are a real threat to social stability in many countries. Although economic inequalities are tending to decrease between countries, they are increasing within countries. Food insecurity is no longer monopolized by the poorest countries in the world, it is also rising in rich countries. For instance, food insecurity is currently estimated to be affecting around 2 million people in France and 35 million in USA. With the increased application of robotics and artificial intelligence, job prospects point towards a rise in unemployment and further impoverishment of the population. This pattern will have major health impacts, with a high incidental cost to society, i.e. the poorest people are most affected by diseases related to a poor diet. It also has impacts in terms of public security as the prospects of social integration of youth via work dwindle—a situation which could contribute to promoting religious or political radicalization movements. A transition towards more equitable and integrative economic systems is also essential. The food system bears considerable economic weight in countries where a large share of the population is involved in agriculture. Agriculture and food businesses are major sources of employment for youth entering the labour market in high numbers every year. The closer

these activities are to food consumers (restaurants, distribution) and the more the products are fresh, the less these activities can be relocated. This represents a new challenge for food systems—to create jobs that will attract youth, provided that prestigious large-scale industrial projects do not arrive on the scene too quickly to compete with the highly labour-intensive small business sector.

Our changing food habits could be interpreted as a distancing process. This includes geographical distancing, with food supply sources becoming increasingly remote; economic distancing, with the multiplication and empowerment of trade intermediaries, etc.; cognitive distancing with growing consumer ignorance regarding the conditions under which the food they eat has been produced and marketed; and finally, political distancing, with citizens having diminishing power to orient their food systems under the pressure of lobbies and the sophisticated communications networks of industrial operators. These different types of distancing generate distrust amongst food system stakeholders, including public authorities, as well as growing concern about food quality and a sense of abandonment by the system. As Claude Fischler noted, the challenge today is to "win back" food, to restore the confidence of consumers and ensure that they recover some control over their food systems.

Sustainable food systems could thus be defined as systems that:

- protect the environment and biodiversity so as to not deplete resources and jeopardize the livelihoods of future generations
- enable access for everyone at all times to sufficient, healthy, nutritional and culturally acceptable food
- rely on an equitable and inclusive system favouring the creation of jobs for everyone and reducing power imbalances between businesses and within value chains for a more equitable distribution of added value
- promote social cohesion and respect for diversity and cultural dynamics
- renew food consumers' confidence in their food systems, with greater participation in determining the orientations of these systems.

The transition towards such sustainable food systems represents a considerable scientific research challenge. But could this transition contribute to inventing new food systems while implementing the same approaches and tools as those used to build the agro-industrial system? This would require a number of changes in current scientific approaches.

The first concerns the actual status of science in society. Indeed, science has long been considered as the only legitimate viewpoint for guiding collective action, with experts from this sphere being advisors to policymakers or entrepreneurs. This status is, however, eroding. First, it is increasingly difficult for science—as it progresses—to come up with 'simple' answers to society's questions. Yesterday's facts are now questioned as it becomes clear that the mechanisms involved are more complex than previously thought. So it is difficult to effectively respond with sufficient certainty. Regarding nutrition, the rationale of matching needs with macro- and micro-nutrient inputs now seems insufficient for drawing up nutritional guidelines. The role of intestinal microbiota in health and the recognition of the impact of the environment, including food, on its quality has broadened the scope of knowledge, thus further putting yesterday's hard facts in question. Moreover, epinutrigenetics and the recognition of the effects of food on gene expression, opens new areas of research that could alter our views on healthy food. The empirical knowledge and know-how of laypeople and professionals is changing status. This knowledge—although not developed in scientific ways—is sometimes effective in solving problems and is gaining new legitimacy in the public debate. From a situation where public decisions were based solely on scientific expertise, a new more shared governance is emerging in which a diverse range of stakeholders and viewpoints are summoned and debated in order to co-construct collective decisions. With this change in the status of science, more attention is being jointly focused on layperson and professional knowledge, while the performance resulting from this knowledge is being scientifically assessed and its potential relevance recognized.

The second necessary change concerns the importance of assessing the effects of combined and interacting arrangements of factors, rather than (as is often the case) assessing them separately and considering that they are independent of each other. Here again, there are interesting examples regarding nutrition. Approaches geared towards enriching each food with nutrients necessary to cover human needs are evolving towards new approaches that are based on the recognition that we do not eat foods separately but instead they are usually combined with other foods in dishes, meals and diets. These combinations may have synergic or antagonistic effects, some of which have been identified, but not all. For instance, meeting people's iron needs cannot be reasoned simply by adding up the iron contents of each food. Instead, it is important to take into account the favourable effects of simultaneously consuming vitamin C on its assimilation or, on the contrary, its blockage by the consumption of tannin-rich foods. The monitoring scale generally has to be changed to take these phenomena into account, while adopting a more holistic approach, where it is essential to take the environment and the setting into account. This often leads to single solutions being abandoned in and favour of specific ones. The success of this

rationale then depends on the institutional landscape of the solution providers. Big institutions that favour massive generic solutions that could be widely disseminated, and that enable economies of scale, are currently oriented towards more decentralised innovation systems that are more open to local stakeholders and where co-construction approaches are promoted. Hence, scientific tools capable of multicriteria assessments of situations involving combined factors must be invented, while developing more effective research governance strategies.

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The University of Sheffield
Western Bank
Sheffield S10 2TN
UK

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