

Rethinking Food Security in Mexico: Discussing the Need for Sustainable Transversal Policies Linking Food Production and Food Consumption

Repensar la seguridad alimentaria en México: discutir la necesidad de políticas sustentables transversales vinculadas con la producción y el consumo de alimentos

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Abstract. Two of the biggest challenges of humanity are to achieve global food security by reducing environmental impacts, and provide healthy diets for all people. In this paper, we discuss the complexity involved in designing solutions on food security. We focus on Mexico due to the heterogeneity of the country in relation to socioeconomic, cultural and ecological factors. First, we discuss the need to analyze food security by integrating the sustainability of both food production and food consumption. Then we describe the Mexican situation by analyzing five food production-consumption systems that illustrate the diversity of agricultural systems and dietary patterns. This analysis reveals that the pathway to achieve food security in Mexico should include sustainable food production systems and dietary patterns. The solution should be site-specific considering the ecological, socioeconomic and cultural situation, so an integrative geographical perspective is needed with a bottom-up approach; in this way, food security for future generation will not be compromised. To reach this, transversal policies involving the agricultural, health, environmental and federal agencies are required.

Keywords: Food Security; Mexico; Sustainability; Agriculture; Dietary patterns; Nutrition.

Resumen. Uno de los mayores desafíos de la humanidad es alcanzar la seguridad alimentaria global reduciendo los impactos ambientales y alcanzado dietas sanas para todas las personas. En este artículo, hacemos una reflexión sobre la complejidad de diseñar soluciones para la seguridad alimentaria. Nos enfocamos en México por su heterogeneidad en relación a factores socioeconómicos, culturales y ecológicos. Primero, discutimos la necesidad de analizar la seguridad alimentaria integrando la sustentabilidad de la producción y consume de alimento. Luego, describimos la situación de México al analizar cinco sistemas de producción-consumo de alimento que ilustran la diversidad de sistemas agrícolas y patrones alimenticios de México. Con este análisis demostramos que el camino para alcanzar la seguridad alimentaria debe incluir tanto un sistema productivo sustentable como una dieta sustentable. La solución debe ser sitio-específica considerando la situación socioeconómica, cultural y ecológica; por lo que se necesita una perspectiva integral geográfica con un enfoque “bottom-up”. De esta manera, no se comprometerá la seguridad alimentaria de futuras generaciones. Para esto, se necesitan políticas transversales entre las instancias/agencias gubernamentales agrícolas, salud y ambientales federales.

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Palabras clave: seguridad alimentaria, sustentabilidad, agricultura, patrones dietéticos, nutrición.

INTRODUCTION

Recent literature has shown the urgency to address global food security by reducing environmental impacts and achieving healthy diets for all people (Davids et al. 2016, Foley et al. 2011, Godfray et al. 2010a, Godfray et al. 2010b, Godfray et al. 2014). The current use of natural resources for human consumption is reaching the planetary limits, with global food production as a major driver (Rockström et al. 2009). In the coming decades, the global population will increase in both numbers and affluence. This means that there will be more people with a more luxurious food consumption, so more resources will be demanded. Rich diets have a higher environmental impact, as affluent diets that are rich in animal food products require more resources per person than basic diets (Kastner et al. 2012, Hoekstra et al. 2012, Leach et al. 2012, Ranganathan et al. 2016, Shibata et al. 2016). Diets are changing faster in developing countries due to the rapid urbanization, increased socioeconomic development, retail food services and fast food (Kearney 2010).

A large proportion of the global population does not have access to a healthy diet, even though global *per-capita* food consumption has increased in the past decades (FAO 2013). Malnutrition is still a current issue, and fighting hunger is FAO's main target since some 800 million people are currently undernourished worldwide (FAO et al. 2015). Today's rapid changes in the diet in developing countries are not improving nutrition. Obesity more than doubled at a global level since 1980, and nowadays almost 2 billion people are overweight (WHO 2016), resulting in serious chronic diseases (FAO, 2016). Obesity is a global epidemic and, in many countries, it is taking over malnutrition.

Thus, global food security involves two major complex issues: the large resource use and environmental impact related to food production, and the nutritional status of the global population. Several studies have shown that food security should be

addressed from both the production and the consumption spheres; for example, changing production systems to a more sustainable production and shifting diets to lower meat consumption (Foley 2011, Ranganathan et al. 2016, Davids et al. 2016, Godfray et al. 2010a/b, Godfray et al. 2014). These studies stress the need to implement integrated policies to solve the issue. However, global solutions should be tailored for each particular country, due to the marked differences between countries in terms of the socioeconomic, political, cultural and environmental circumstances.

The Mexican Context as Study Case

Mexico is a novel country to look at when addressing food security. It is one of the transition countries where the diet of its inhabitants is evolving at a fast pace due to urbanization and the increase in income (Rivera et al. 2004). Furthermore, the current status of the food system shows complex and diverse issues in both agricultural production and food consumption. As regards agricultural production, there is a large diversity in agricultural practices that translates into an heterogeneous productivity and the various environmental issues related to it. The reasons are complex and involve socioeconomic, agro-climatic and cultural conditions. Mexico is a megadiverse country that offers optimal conditions for a number of crop types (Sarukhan et al. 2010). The socioeconomic situation of farmers ranges from low-income small producers with small-scale farms and low use of agricultural inputs, to high-income producers with large-scale farms and a substantial use of inputs. For instance, according to the 2007 National Census of Agriculture, 50% of farmers engaged in maize corn production had less than 1.5 hectares per farmer (INEGI, 2007). These farmers produced less than 10% of the total maize production in Mexico, with very low crop yields. In contrast, large-scale maize producers (which own more than 10 ha per farmer) represent a mere 4% of all farmers engaged in maize production. These large-scale farmers produced 50% of the total maize production in Mexico, with very high crop yields (INEGI, 2007). The technologies used by each farmer are also widely diverse, resulting in contrasting productivities and

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