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The role of farming and rural development as central to our diets

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ABSTRACT

Farming and rural development are central to the diversity of global food systems and diets, both significant factors in determining the nutrition and health outcomes of the world's population. Diets are not static and indeed are changing due to globalization, urbanization and demographic shifts. In addition, multiple burdens of malnutrition (both undernutrition and overweight and obesity) are not improving fast enough and in some cases, reversing for the worse. Unhealthy diets are major contributors to these burdens. Rural people and particularly smallholder farmers, are critical in delivering the key nutrients in the global food supply that make up our diets for human health. However, rural populations in some parts of the world are often poor, and suffer burdens of malnutrition on both ends of the spectrum – undernourished or overweight. They are also faced with significant challenges, often due to poor investment towards rural development. Challenges include natural resource declines, climate change risk, women disempowerment, conflict, and urbanization; which wreak havoc on these populations. If actions are not taken and their livelihoods are not prioritized, it will be a challenge to achieve sustainable development in these rural places that are so essential for future food systems.

1. Introduction

For most of the global population, farming is or was an integral part of our culture and heritage. Almost every society's history involves agrarian societies, made up of farmer families, pastoralists, and fisher folk, domesticating plants and animals, in which agriculture became the foundation of all economies [1]. Some countries have gone through significant structural transformations in their agriculture sector, but also in their manufacturing and service industries, allowing for economies to grow and thrive across multiple dimensions. However, other countries are still very much agrarian, and in some cases, a quilt of smallholder farms in which the agriculture sector has not yet led to significant growth for the said countries.

When thinking about a food system – food moving from production to markets and the many steps in between including storage, transport and distribution, processing and packaging – it all starts at the landscape level and with farmers. Yet, without agriculture, farms and farmers, we would not have the diverse landscapes, food baskets and diets that the world is fortunate to benefit from [2].

2. How are global diets fairing?

The biodiversity of plants and animals, and the decisions that farmers make on which species and varieties to produce, leads to the

types of diets that we consume. Diets comprise the foods that an individual consumes that meet energy needs, provide the diversity of foods to meet nutritional needs, be affordable, accessible and culturally appropriate, and be safe for consumption [3]. Dietary patterns are the quantities, and combinations of different foods and beverages in diets and the frequency of how they are habitually consumed [3]. However, some basic principles can be applied that define “healthy” diets. The International Conference on Nutrition Rome Declaration states, “nutrition improvement requires healthy, balanced, diversified diets, including traditional diets where appropriate, meeting nutrient requirements of all age groups and all groups with special nutrition needs, while avoiding the excessive intake of saturated fat, sugars and sodium, and virtually eliminating trans fats, among others” [4].

However, one of the major causes of malnutrition and its subsequent health outcomes is diets. Unhealthy diets are now the number one risk factor globally for deaths and disability-adjusted life-years lost [5]. Typically, unhealthy diets are those low in fruits, vegetables, whole grains, nuts and seeds, dairy (high in calcium), fiber, seafood and fish (high in omega-3 fatty acids), and polyunsaturated fatty acids. At the same time, these diets can be high in red meat, processed meat (smoked, cured, salted, or chemically preserved), sugar-sweetened beverages, trans fats, and highly-processed food consumption [5]. Highly-processed foods are usually characteristically high in salt, trans fats and added sugar [6,7].

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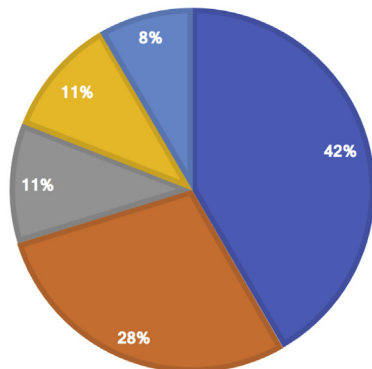
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A)

570 MILLION FARMS IN 161 COUNTRIES, BY REGION OR COUNTRY GROUP

■ China
 ■ East Asia and the Pacific (excluding China) (n = 14)
 ■ Europe and Central Asia (n = 14)
 ■ India
 ■ sub-Saharan Africa (n = 41)



B)

570 MILLION FARMS IN 161 COUNTRIES BY INCOME GROUP

■ Upper middle income countries (n = 47)
 ■ Lower middle income countries (n = 38)
 ■ Low income countries (n = 30)
 ■ High income countries (n = 4)

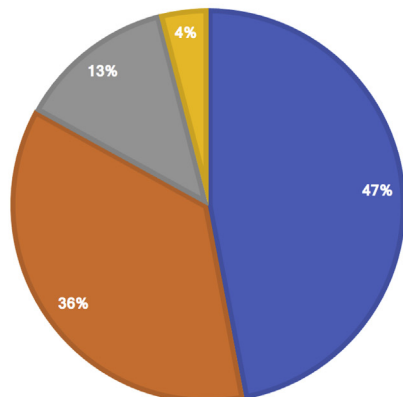


Fig. 1. Estimated number of farms in the world by regions and by county wealth category. Legend: (A) Number of farms by Region or Country Group. (B) Number of Farms by Income Group.

What we are left with is a massive burden of malnutrition. At the global level, food systems produce enough food, yet malnutrition exists in almost every country with some countries reeling from multiple burdens that are complex to tackle [8]. Approximately 850 million people are still undernourished, 155 million children under five years of age are stunted; and 52 million are wasted [9,10]. Micronutrient deficiencies (iron, zinc, vitamin A, iodine, folate, etc.) are still a major public health concern. At the same time, overweight and obesity has more than doubled since 1980. A staggering 2.1 billion adults are overweight or obese [11]. An estimated 41 million children under five were overweight, a quarter living in Africa and almost half in Asia [10].

3. Who is delivering our diets?

Farms and farmers produce the food that serves as the basis of our diets. The total number of farms in the world is now estimated to be > 570 million taken from World Census of Agriculture data from 1960 to 2010 [12]. These data come from 167 countries, 96% of the world's population, 97% of the population active in agriculture, and

90% of agricultural land worldwide [12,13]. As Fig. 1 shows, most of the farms are found in upper- and lower-middle income countries with China and India making up roughly 60% of the farms in the world. Many of these farms are considered small-scale and are family farms.

Smallholder farms are usually defined by land size, but some countries also consider the number of livestock held, the assets used, or gross sales coming from individual farms. The most commonly used thresholds for designating small farms are one and two hectares, recognizing that farms below this threshold include a very diverse range of enterprises [13]. Of farms worldwide, 84% are smaller than 2 ha (approximately 475 million farms), but only operate 12% of all farmland. According to FAO [14], smallholders can be small-scale farmers, pastoralists, forest keepers, fishers who manage areas varying from < 1 to 10 ha.

Of those farms that are considered small-scale, approximately ~3.4 billion people currently live and work on those farms across the developing world [15]. Eighty percent of the farmland in sub-Saharan Africa and Asia is managed by smallholders working on up to 10 ha and these smallholders provide 80% of the food supply in Asian and sub-Saharan Africa. Whereas in Australia, Latin America and North America, food coming from rural places are from medium to large holdings [16].

When it comes to “family farms,” there are two criteria that are common in defining what consists of the “family” aspect of farms: The first criteria is that someone in the household owns, operates and/or manages the farm; and second, a “minimum share of labor” comes from the owner and relatives [13,17]. > 98% of the farms are characterized as family farms and they operate at least 58% of the agricultural land. It is estimated that family farms in sub-Saharan Africa and Asia that meet 36–114% of the domestic caloric requirements [17].

Agriculture employs 1.3 billion people globally, or close to 40% of the global workforce [18]. In low-income countries, agriculture employs up to 75% of the population [13]. Women comprise 45% of the agricultural labor force of developing countries up to almost 50% in Eastern and Southeastern Asia and sub-Saharan Africa [19]. Agriculture-led growth and agriculture-based solutions can make important contributions to reduce undernutrition [20], as well as to dietary diversity, micronutrient sufficiency and nutritional status [21]. Agricultural productivity is fundamental for sustaining the nutritional and health status of billions of people, ensuring food security, and generating the resources to access adequate care, health, water, and sanitation services [22]. The interactions among health, nutrition and agriculture are mutual: agriculture affects health and health affects agriculture—both positively and negatively [23].

4. What are farms providing?

Farms are made up of landscapes, and these landscapes can be rich in biodiversity and ecosystem services. Farms can also be less diverse such as the case with mono-cropping systems. Biodiversity richness, and in the context of agriculture and farming systems agrobiodiversity, are important in maintaining the diversity of foods that make up our dietary patterns. Smallholder farming systems and landscapes are particularly diverse. Herrero et al., [16] show that globally, diversity of agricultural and nutrient production diminishes as farm size increases and smaller landscapes with more agrobiodiversity provide more nutrients into the global food supply, particularly micronutrients (53 to 81% of micronutrients in the food supply) [16]. Fig. 2 shows the most critical nutrients for human health, by region and size of farms and the species richness of smallholder farms in different regions.

Several studies have attempted to better understand the linkages between smallholder farmer production and dietary diversity in traditional systems – such as rural places, or less formal food systems. Both on-farm production and the diversity of that production as well as access to markets are essential for the diets of smallholder farmer families. Studies demonstrate the significance of homestead production and its

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