



Food and Agriculture  
Organization of the  
United Nations

# Organic foods

Are they safer?

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Are they safer?

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**FOOD SAFETY**

TECHNICAL TOOLKIT FOR ASIA AND THE PACIFIC

Food and Agriculture Organization of the United Nations  
Bangkok, 2021

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## Abstract

Organic agriculture is increasingly under the spotlight for being a promising approach to address the challenges raised by the increasing demographics and urbanization as well as climate change. In the eyes of consumers, this often translates into healthier, safer, tastier and more environmentally friendly foods. But the “organic” certification actually indicates products that are produced in accordance with certain standards throughout the production, handling, processing and marketing stages, and which aim at a different set of benefits: better incomes for small-scale farmers and increased food security, environmental benefits such as improved soil and water quality and biodiversity preservation, and improved animal welfare. Therefore, while organic agriculture may relate to a set of different improved practices, the term organic in and of itself is not a guarantee of food safety. Finally, organic agriculture can be considered as part of the broader approach of agroecology, where ecological concepts and principles are applied in order to optimize interactions between plants, animals, humans and the environment, and consideration is given to social aspects that need to be considered for a sustainable and fair food system.

## Keywords

Agroecology, organic, agriculture, organic farming, biodiversity, food legislation, food standards, food systems, climate change, certification bodies, pesticides, fertilizers, agrochemicals, animal welfare, environment, sustainable development, ecology, Food and Agriculture Organization of the United Nations (FAO), Asia and the Pacific.



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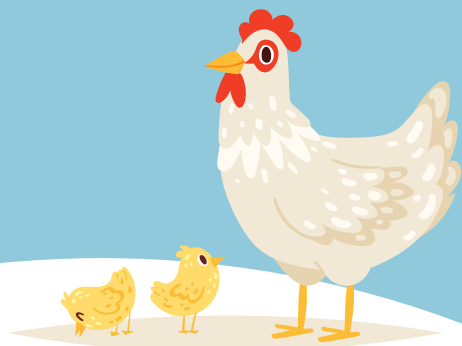
# 1

## Introduction

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From 2000 to 2018, global sales of organic food increased by USD 77 billion. In 2017, there were nearly 70 million hectares of organic farms under production worldwide, 835 000 of which were in India alone (Statista, 2020). These increases may be linked to consumer perceptions concerning human health, environmental concerns, and sensory attributes such as nutritive values, taste or freshness (Shafie and Rennie, 2012).

All food needs to undergo a safety assessment, no matter how it is grown; therefore, food safety is a requirement for both organic and conventional food items. The following sections of this paper will discuss organic agriculture and its ecological roles in sustaining farming practices and protecting the environment, as well as its economic aspects. This paper will also discuss organic agriculture and food safety, and will introduce the concept of agroecology. Finally, the roles of different stakeholders, especially governments and their policies, in supporting organic sector development while guaranteeing food safety are discussed.



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# Organic agriculture

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## 2.1. Background

The current focus of worldwide food systems is on increased productivity and economic growth. Yet, these productivity gains come at a cost. A recent report estimates that for every US dollar spent on food, society pays two dollars in health, environmental and economic costs: this indicates that conventional food production systems utilize finite resources, are wasteful and polluting, and harm natural systems (Ellen MacArthur Foundation, 2019). The Southeast Asia region, for example, has undergone important changes in its food systems over the last few decades, mostly due to rapid economic growth, increasing population and demographic shifts, rapid urbanization, rural and urban transformation, changing food consumption behaviours, and climate change (FAO, 2018a). The region now faces several important challenges such as the triple burden of nutrition (malnutrition, obesity and hidden hunger), consumers' growing distrust of food quality and food safety due to regular food scandals (Barnett *et al.*, 2016) and important biodiversity loss (IPBES, 2018).

Due to environmental degradation, previously contained pathogens in natural habitats are spilling over into local livestock and human communities because of environmental disturbances caused by industrial agriculture, especially large-scale specialized livestock production with its related feed production (e.g. corn or soy bean) and bulk commodities often produced with large quantities of agrochemicals. Industrial agriculture has accelerated natural habitat loss for the past few decades and created conditions for viruses to emerge and spread (IPES-Food, 2020). Millions of small-scale farmers have been impoverished from their land, and malnutrition is threatening hundreds of millions of children in Asia and Africa (FAO, 2018a) For instance, a 4 percent increase in deforestation in the Amazon rainforest has increased the incidence of malaria by nearly 50 percent in nearly

800 villages, towns and cities across the Brazilian Amazon (Altieri and Nicholls, 2020). It is foreseeable that an increasing population, climate change, and natural resource degradation will further stress global food systems and human health security in the future. Current food systems need to be transformed so that they become healthier, more sustainable and inclusive in order to address the urgent and critical problems that we now face (FAO, 2018c) This situation requires a review of traditional food systems, and consideration needs to be given to alternative approaches to agricultural systems. Increasing production is necessary but not sufficient for ending hunger. Agriculture in the future will need to decouple from fossil fuel dependency, have a low negative social and environmental impact, and be multifunctional and resilient to climate change. The biggest and most durable benefits will likely result from more radical agroecological measures that will strengthen the resilience of farmers and rural communities, such as diversification of agroecosystems in the form of polyculture systems accompanied by organic soil management, water conservation and harvesting, and general enhancement of agrobiodiversity (Altieri *et al.*, 2015).

In a study conducted in Southeast Asia in 2015 (Castella and Kibler, 2015), the Agroecology Learning Alliance in Southeast Asia identified six major agroecological farming practices: 1) conservation agriculture, 2) systems of rice intensification 3) integrated pest management, 4) organic agriculture, 5) integrated farming, and 6) agroforestry. Among these systems, organic agriculture has received worldwide attention and has expanded in production area and in the number of stakeholders involved.



## 2.2. What is organic agriculture?

It should be noted that all farming can be more or less considered “organic” because the food produced is composed of organic materials, and most of the nutrients that pass through the soil are organic. In addition, there is “default” organic farming, which is a result of some farmers not being able to access chemical inputs due to financial, market or technical constraints, and so practice organic farming by default.

Within this paper, “organic agriculture” is considered to be a form of farming that follows specific socio-economic and ecological rules, such as: types and quantity of external inputs used (often referred as chemical fertilizers and pesticides), natural resources conservation (biodiversity, soil and water), smallholders and family farmers’ empowerment, and animal welfare.

The concept of “organic”, therefore, has hybrid international roots, but the key principle is that healthy ecological systems promote agriculture. Organic meanings and practices, however, have largely been defined in the global north. Methods of organic farming, or what Europeans call ecological farming, were initially developed by isolated individuals and groups in Europe, North America and Japan. Movements in the 1960s popularized the idea of organic farming, criticizing the destructive nature of agro-industrial practices, and instead creating local production, distribution and consumption systems that link small-scale organic farms (Raynolds, 2004).

The management of organic farms is a combination of general organic principles and more detailed rules set out by certification bodies. There have, so far, been many explanations and definitions for organic agriculture. However, there are two definitions of organic farming that are mostly cited in the literature:

# 1



Organic agriculture is a holistic production management system which promotes and enhances agroecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system. (FAO and WHO, 1999).

# 2



Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved (IFOAM, 2020).

## 2.3. Benefits of organic agriculture

### 2.3.1. Income and food security for small farmers

To be successful, organic farmers need to follow polyculture farming principles such as mixing and/or rotating farming systems, or integrating crops and livestock production, in order to optimize nutrient use and recycling, and improve ecosystem service quality for the whole system. With multiple crops and/or with animals, total production per unit area is often substantially higher than in a monocropping system. Many researchers have proved that a diversified farming system can help to improve a farmer's income and life quality from a better-quality farming environment, nutrition intakes, and efficient family labour use (Cheikh *et al.*, 2014; Schick *et al.*, 2018), enhancing family labour use efficiency (Schick *et al.*, 2018). With diversified agricultural outputs, organic systems can help buffer market risks and, thus, provide better market security for farmers. In addition, a certain quantity of diversified products is often consumed by farmers, thus providing them better diets and more secure food sources.

Despite receiving lower yields and requiring higher labour requirements, organic farms may take in an equal or higher income than conventional farms. This is mainly because of the higher prices paid for organic produce. Studies have shown that higher prices for organic products and lower farm-material costs can compensate for lower organic cropping yields, consequently resulting in higher income for organic farmers (European Commission 2013).

Characterized by diversified crops, organic systems have been shown to obtain higher farming nutrient efficiency (David *et al.*, 2011) and higher yields during years of extreme climate (FAO, 2017). Observations of agricultural performance after extreme climatic events (e.g. hurricanes and droughts) in the last two decades have revealed that resiliency to climate disasters is closely linked to farms with increased levels of biodiversity (Altieri *et al.*, 2015). In China, field experiments in rice cultivation have confirmed that a diversity of rice varieties grown within the field reduces the severity of rice blast diseases by 12 percent to 77 percent (FAO, 2017). Given the increasing threats of climate change, multifunctional land management schemes such as organic farming systems can be a good option for increasing socio-economic viability and sustainability for small-scale farmers.

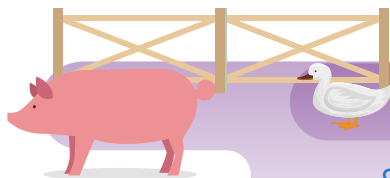


### 2.3.2. Environmental benefits

Worldwide, farmers have been observed to be increasingly dependent on external inputs for farming practices. For instance, once farmers start to use chemical pesticides for their crops, natural or biological control functions of the ecosystem are gradually diminished, forcing farmers to continue to use pesticides to protect crops from pests (Wilson and Tisdell, 2001). After years of dependence on intensive monoculture and chemical inputs, farm soil will become degraded to a point where farmers report harder soils, which makes farming more difficult and labour intensive, few or no earth worms in the soil, and unhealthy plants and trees, all of which leads farmers to use yet more chemical fertilizers. As a result, farmers must pay more for farm inputs but face more production risks and receive less output from their farms. These problems are largely associated with degradation of ecosystem services that support a farming environment, including soil and nitrogen formulation, mineralization, pollination, biological control, water cleaning and restoration.

Ecosystem services are the benefits that humans derive from ecological processes and ecosystem function. For global ecosystem services to maintain or even increase their current value, agricultural systems have to be designed with them in mind, such that nonmarket ecosystem services contribute between 50 percent and 70 percent of the total economic value of the farm ecosystem. Converting conventional agriculture to combined food and energy ecosystems could substantially and simultaneously enhance food, fiber, energy, and global ecosystem services production and sustainability (Porter and Costanza *et al.*, 2009).

Because plants and trees are the main producers in natural food chains, diversification of them will automatically drive the diversification of animals and microorganisms, both above and within the soil. For instance, organic farming schemes can help restore species richness and abundance by 30 percent to 50 percent, and rebuild their associated ecosystem services (Reganold and Wachter, 2015).



Organic farming systems are considered to be better than conventional farming systems in terms of environmental indicators such as better soil quality and higher biodiversity, resulting from not using synthetic fertilizers and chemical pesticides, practicing minimum tillage (or non-tillage), using organic matter application or recycling, and mixing and/or rotating crops. These characteristics make organic systems better able to biologically sustain themselves. For instance, the natural predation rate of aphids is 20 percent and 53 percent within 24 hours in pasture and cereal ecosystems, respectively (Porter and Costanza *et al.*, 2009). Even with lower spray inputs, organic fields often support fewer phytophagous pests than conventional fields, indicating that the higher presence of biological control agents (predators and parasitoids) in organic fields is effective in moderating crop pest populations (Fusaro *et al.*, 2016). These characteristics make organic farming systems functional without chemical inputs, thereby placing few negative environmental impacts on the land.

### 2.3.3. Animal welfare

The International Federation of Organic Agriculture Movements (IFOAM) has developed four principles of organic agriculture: health, ecology, fairness and care.

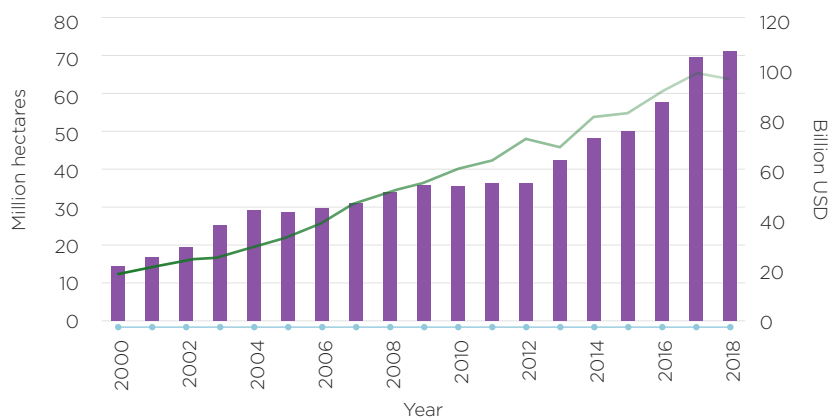
The main ethical concerns regarding the welfare of farm animals include: 1) animals should be able to lead natural lives, 2) animals should be free of intense and prolonged negative affective states, such as fear and pain, and 3) animals should function well in the sense of having satisfactory health and physiology (Sutherland *et al.*, 2013).

In organic farming systems, animals are fed with more diverse types of feeds, some of which come in forms that are fresh and, thus, richer in nutrients – such as vitamins and minerals – than processed feeds. Organic farm animals are also treated for diseases with alternative remedies, instead of overly relying on antibiotics. In addition, organic animals are often exposed more to the out of doors, and so they enjoy more natural lives as compared to conventionally raised farm animals.

### 2.3.4. Consumer preferences

Globally, organic agriculture is gaining popularity, both from farmers and consumers. The agricultural area under organic cultivation has increased by almost 5 times in the past 20 years, from 15 million hectares in 2000, to an estimated 71.5 million hectares in 2018 (FAO, 2020a). As of 2018, there were over 2.8 million organic producers, including 1.1 million in India alone. Worldwide sales of organic food has increased from around USD 18 billion in 2000, to nearly USD 95 billion in 2018 (Statista, 2020) (see Figure 1). The United States of America is the largest market for organic products, and organic food sales there have increased 13 times, from USD 3.4 billion in 1997, to over USD 45 billion in 2017 (OTA, 2018).

**Figure 1. World statistics on organic agriculture: area and sales**



Out of 172 countries covered in a survey by the Research Institute of Organic Agriculture, 87 had organic standards, and another 18 were developing legislation. Seventy-two countries were using participatory guarantee systems, which are defined as “locally focused quality assurance systems certifying producers based on the active participation of stakeholders and built on a foundation of trust, social networks and knowledge exchange.” (IFOAM, 2020, p.1). Globally, an estimated 123 participatory guarantee systems have been established, and another 110 are under development. In addition to non-government organizations and civil society groups, governments are increasingly supporting organic agriculture (Hill, 2016).

A considerable number of studies on organic farming and consumption have confirmed that the majority of consumers often consider organic food as being healthier, safer, tastier and more environmentally friendly. Consumers' personal values are, thus, important factors that influence consumers' attitudes towards organic food. It is predicted that the demand for organic food will increase tremendously in the near future. Following the global trend, it is expected that people living in developing countries will be more likely to pay attention to organic foods (Huy and Chi *et al.*, 2019).

Marketing factors, however, such as price, convenience, distribution and brand familiarity are also important criteria for consumers' decision-making: sometimes these factors may constrain consumers in their search for organic food, as they may not always be easily accessible.



## 2.4. Organic agriculture and food safety

It has been articulated that developing countries have weak state institutions that fail to build trust in food safety and environmental protection in the agrifood sector. Insufficient levels of trust in the institutions have been observed in many countries, including Viet Nam (Hoi and Mol *et al.*, 2009), Thailand (Schreinemachers *et al.*, 2012), China (Bai *et al.*, 2007), including Taiwan Province of China (Jeng and Fang, 2003), Russian Federation (Berg and Kjaernes *et al.*, 2005).

For many consumers, food safety relates to hazards of contamination by agrochemical (mostly pesticides) residues and by microorganisms that cause disease (e.g. *Salmonella* sp., *Coliform*) during the production phase. In reality, chemical and biological contaminants may occur throughout food production and market distribution processes, and the way foods are stored and conserved by each consumer also makes a difference in mitigating the risks of food contamination. Various “organic” labels rely on rules that prohibit the use of fertilizers and agrichemicals under the belief that omitting these types of inputs ensures that food is safe. In fact, pesticides that are physiologically produced by plants are vastly abundant in food, although general concerns over biocides have led some consumers to seek food that is grown without chemicals (i.e. organic food). For instance, Ames *et al.* (1990) have shown that over 99 percent of pesticides in US diets are produced physiologically by plants. At high dosages, even these kind of pesticides are carcinogenic (David *et al.*, 2011).

Conventional and organic farmers both need to follow the same safety standards. The choice of organic foods and farming has little to do with food safety standards, but is rather dictated by the consideration of social and environmental aspects of food systems.

## Box 1. Two myths about organic foods

### **"Organic farms do not use pesticides" is a false statement**

Pesticides of plant origin are used in organic agriculture. It is important to note that organic farming also relies on mechanical and cropping practices. In place of synthetic inputs, organic agriculture tends, in fact, to rely on crop rotations, composting, and biological pest control to maintain soil productivity, supply plant nutrients, and control insects, weeds and other pests. In organic animal husbandry, animals are fed organic feeds and raised with no or few antibiotics, growth hormones, and others.

### **"Organic food is safer" is a false statement**

The organic label is not a guarantee of food safety. Organic refers only to a product that has been produced in accordance with certain standards throughout the production, handling, processing and marketing stages; it does not refer to the characteristics and properties of the finished product. In general, provided that growers adopt proper agricultural practices, both conventional and organic farming systems have the potential to produce safe food. Organic standards will not exempt producers and processors from compliance with general regulatory requirements such as food safety regulations, pesticide registrations and general food and nutrition labelling rules.

## **2.5. Agroecology – a systemic approach for transforming food and agricultural systems**

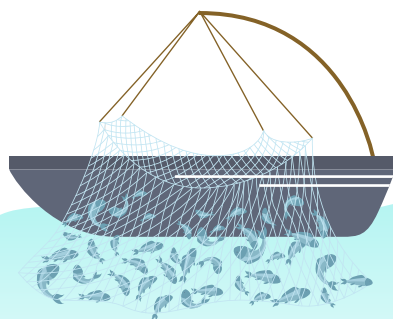
Agroecology promotes a systemic approach involving the whole food system. It is based on applying ecological concepts and principles to optimize interactions between plants, animals, humans and the environment, while taking into consideration the social aspects that need to be addressed for a sustainable and fair food system.

Thus, an agroecological approach to sustainable agriculture and food systems is defined as one that favours the use of natural processes and limits the use of external inputs. Agroecology promotes closed cycles with minimal negative externalities, and it stresses the importance of local knowledge and participatory processes that develop knowledge and practice through experience, as well as scientific methods, and the need to address social inequalities.

By building synergies, agroecology can support food production, food security and nutrition while restoring the ecosystem services and biodiversity that are essential for sustainable agriculture. Agroecology can play an important role in building resilience and adapting to climate change. It is based on a context-specific design and organization of crops, livestock, farms and landscapes.

To harness the multiple sustainability benefits that arise from agroecological approaches, an enabling environment is required, including adapted policies, public investments, institutions and research priorities. Agroecology is the basis for evolving food systems that are equally strong in environmental, economic, social and agronomic aspects (FAOb, 2020).

Overall, agroecology can be seen as an overarching umbrella under which many different farming approaches can exist as long as they support a transition towards sustainable food systems. This can include production practices (e.g. agroforestry, livestock-crop integration, systems of rice intensification, integrated pest management, rice-duck or rice-fish farming, conservation agriculture), environmental dimensions (e.g. biodiversity, climate resilience), economic dimensions (e.g. participatory guarantee systems, farmers markets, value adding), and social dimensions (e.g. farmers' organizations, social movements, focus on decent work).



Both organic and agroecological systems strive towards a common goal of maintaining ecological, social and economic qualities of farms and farming communities. In that regard, organic agriculture can be considered as part of agroecology although the two differ in two main ways:

- there is no certification for agro-ecological systems and farming; and
- organic agriculture is typically focused more on cropping practices and input regulations, while agroecology seeks to integrate diverse, sustainable cropping practices, local knowledge, and socio-economic principles into the design of food systems.

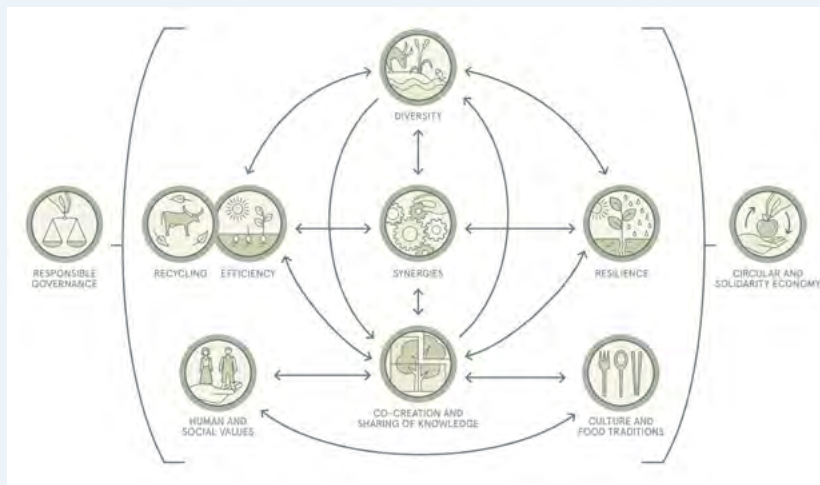
In order to guide countries in transforming their food and agricultural systems to mainstream sustainable agriculture on a large scale, and to achieve Zero Hunger and multiple other Sustainable Development Goals, the Food and Agriculture Organization of the United Nations has developed “10 Elements of Agroecology” (FAO, 2018c). The elements in this framework describes the common characteristics of agroecological systems, their foundational practices and innovation approaches, and provides the context and features of an enabling environment that constitute the socio-ecological system (FAO 2020).

Figure 2 shows a graphical representation of the “10 elements”, and highlights their interlinked and interdependent nature.





Figure 2. The 10 Elements of Agroecology



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The 10 Elements of Agroecology are considered to provide a powerful analytical model that allows stakeholders to evaluate transitions of agricultural systems towards agroecology in a holistic manner (Barrios *et al.* 2020). Therefore, the 10 Elements of Agroecology represent a suitable framework that can serve as a useful model to frame the discussion of many stakeholders to proceed with developing innovative, agroecological approaches for a post-pandemic world.

As an analytical tool, the 10 Elements of Agroecology can help countries to operationalize agroecology. By identifying important properties of agroecological systems and approaches, as well as key considerations in developing an enabling environment for agroecology, the 10 Elements of Agroecology are a guide for policy-makers, practitioners and stakeholders in planning, managing and evaluating agroecological transitions.

Building on the 10 Elements of Agroecology FAO - with partners from academia, research institutes and civil society - has also developed the Tool for agroecology performance evaluation (TAPE), which was designed to support agroecological transitions, at different scales and in different locations, through informed policy-making processes (FAO, 2019).



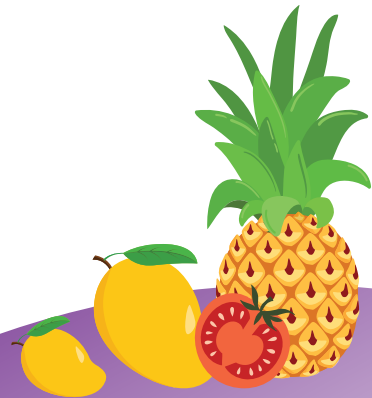
### Box 2. Case study of the National Strategic Framework for promoting Green and Sustainable Agriculture (SFGSA) in Lao People's Democratic Republic

Green and sustainable agriculture (GSA) emphasizes locally adapted farming techniques and practices that aim to increase yields while reducing waste and inefficiency problems in value chains, particularly in the post-harvest stage. GSA remains broad in its approach and the Lao Strategic Framework calls for programme development that identifies a diversity of measures according to the feasibility and social acceptability of each specific case area and sector. GSA merges sustainable environmental practices with skilled labour and efficient markets to reduce poverty and conserve natural resources.

The Lao People's Democratic Republic SFGSA promotes good agricultural practice (GAP) as a minimum standard in agriculture across all crop, livestock, fisheries and forestry and rangeland commodities, in order to achieve a minimum sustainable level of agricultural production. Beyond GAP, GSA supports more sustainable forms of production, such as organic agriculture, conservation agriculture, pesticide-free agriculture, and agroecology. It is acknowledged that sustainable agriculture cannot be implemented throughout

the country in a unified manner. Not all crops, agricultural commodities and markets can be easily adapted to sustainable production — at least not yet in the Lao People's Democratic Republic. Hence, more sustainable forms of agriculture, while aspirational, will be limited to areas wherever they are feasible, with the assumption that autonomous adaptation will occur according to demand. In some areas; for instance, organic products are promoted and sold as safer and healthier products in specialized markets (niche markets) and taking advantage of additional benefits such as direct marketing and agrotourism. In areas where industrial production of cassava for starch for international markets occurs and requires significant external inputs to maintain production levels and international quality standards, minimum GAP are promoted. In this case, commodity specifications are determined by the industry, and farmers rely on policy support for more sustainable agricultural production standards.

Overall, through the SFGSA, Lao People's Democratic Republic intends to enforce minimum standards for any agriculture investment and encourage more stringent standards for niche or unique products (organic agriculture or geographic indications for instance).



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# 3

## Conclusions

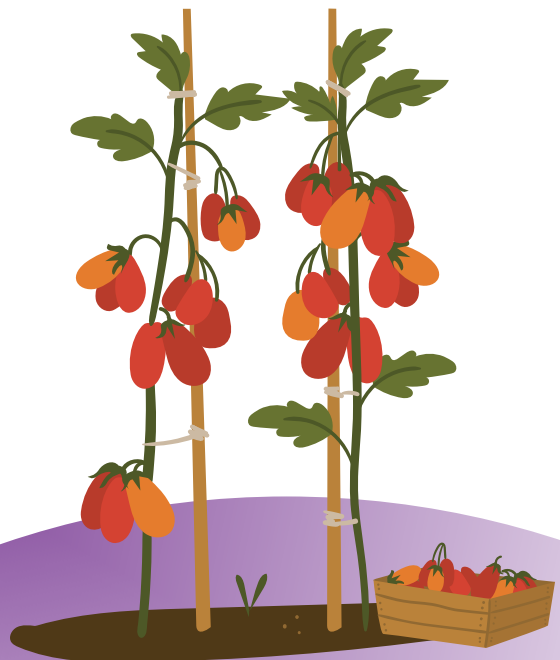
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This paper has discussed the social and economic aspects of organic agriculture and its relationship to food safety, and has introduced the concept of agroecology with a focus on Asia and the Pacific. While this region is subject to several important challenges pertaining to increasing demographics and urbanization, factors such as environmental degradation are likely to increase the challenges that the region will face, including stresses on food systems and human health security. Therefore, a review of traditional food systems is required.

Organic agriculture is defined in many different ways, all of which are linked to socio-economic and environmental benefits, and its management is based on a combination of principles from which a set of rules for certification is developed. Some of the benefits of organic agriculture include: 1) increased socio-economic viability and sustainability for small farmers linked to multifunctional land management schemes; 2) environmental benefits such as soil quality and biodiversity; and 3) better treatment and care of farm animals.

Consumers appreciate such alternative methods, as they are not only considered more environmentally friendly, but also healthier, tastier and safer. With regards to food safety, it is important to highlight that “organic” labels rely on rules that prohibit or limit the use of synthetic fertilizers and agrochemicals, which is an attractive feature for the consumers. Pesticides that are physiologically produced by plants are still used in organic agriculture, which at high dosages may still have negative effects on human health. The major difference is the type of pesticides used. In all cases, the organic label is not a guarantee of food safety. Organic refers only to a product that has been produced in accordance with certain standards throughout the production, handling, processing and marketing stages; it does not refer to the characteristics and properties of the finished product.

Finally, this document has discussed agroecology as an approach involving the entire food system. Agroecology can support food production and food security and nutrition while restoring ecosystem services and biodiversity that are essential for sustainable agriculture, and it can be of support in addressing the challenges provoked by the impacts of climate changes. Agroecology is based on context-specific design and organization of crops, livestock, farms and landscapes. Organic agriculture can be considered a part of agroecology, even though the latter does not require certifications, and it integrates diverse sustainable cropping practices, local knowledge and socio-economic principles into the design of food systems.



# 4

## Recommendations for food safety authorities

### 4.1. Generic recommendations

Based on the above discussion on organic agriculture and a broader consideration for sustainable transformation of agrifood and agricultural systems, the following policy implications and recommendations on organic agriculture are proposed:



Any type of food production approach must have food safety as an essential requirement.



“Organic” and “safe” are not synonymous: “organic” is a way to grow food (following specific standards and guidelines), while “safe” is a basic requirement of all foods to be produced and marketed.



The management of organic farms is based on a combination of principles and rules set by governments and/or certification agencies. Organic standards and regulations may differ between and among countries’ organic value chains, with regard to regulating chemical use and other specific requirements for soil and water quality maintenance.



Organic production standards should target, as much as possible, quantifiable criteria. One example of those criteria is the percentage of land area devoted to crops where agricultural pests are controlled by using repellent "push" plants and trap "pull" plants (as part of integrated pest management strategies). Other examples include the minimum number of crops mixed together at the same farming time and the same proportion in terms of growing areas; a proportion of nitrogen-fixing crops in certain farming rotating schemes; a minimum number of insect traps per unit of cropland; and measurements of the vegetative areas taken, especially in the rainy season.



Effective support of, and up-scaling of, sustainable farming practices that require the commitment and action of different stakeholders in food value chains, especially those where these practices could levers development is important.



Strict and comprehensive regulations are not a mandatory prerequisite for the organic farming sector development. In the early stages of organic development, the most basic regulations should be considered for igniting and energizing development of organic farming practices and market development. In addition, studies reveal that in the animal production sector, animal welfare may be more closely linked to good management than the principles of organic farm management (Sutherland and Webster *et al.*, 2013). Thus, in parallel with regulations, motivation for eco-value perception and technical support for organic farmers is needed to facilitate the organic sector over time with diversified certification schemes that fit with famers' individual or group conditions and interests.



At the country level, governments should adopt differentiated strategies according to the different value chains or agricultural commodities considered.

## 4.2. Practical recommendations

Below is a set of practical recommendations that the national food safety competent authorities might like to consider:



Check and ensure that food safety measures are included in existing (if any) organic certification schemes at the national level.



Develop social media communication materials to inform the general public that consumers have the power to demand safe food.



Co-organize an informal forum with the organic food industry to discuss possible approaches to ensuring the inclusion of food safety measures in organic agriculture.



Promote wise food choices with the full knowledge that the current concept of organic food may or may not include the concept of food safety, and all food items need to be safe.



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## Resources

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### 5.1. FAO resources

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# Organic foods

Are they safer?

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