

CHAPTER 4 : Non-Conventional Food Systems

(Realistic Approaches for Algeria)

1. General Introduction

Non-conventional food and agricultural systems refer to innovative approaches that differ from traditional farming and food distribution methods. These systems have emerged in response to global challenges such as water scarcity, soil degradation, climate change, and rising food costs.

Algeria, like many countries, faces several constraints, including limited water resources, fragile soils, climate variability, and a strong dependence on imported agricultural inputs. Therefore, adopting realistic, non-conventional systems can enhance production, reduce costs, protect the environment, and strengthen national food security.

2. Non-Conventional Food Systems Relevant to Algeria

These systems do not rely on exotic or culturally unfamiliar products. Instead, they focus on local resources, efficient food distribution, and reducing waste.

2.1. Short Food Supply Chains (SFSCs)

Short food supply chains aim to minimize the distance between producers and consumers. They include:

- Direct sales from farmers to consumers
- Farmers' markets and local fairs
- Women's rural cooperatives producing traditional foods

Advantages

- Lower food prices
- Fresher and safer products
- Support for local agriculture
- Reduction of transport-related emissions

2.2. Local Food Systems

Local food systems focus on developing, processing, and promoting region-specific agricultural products.

Key Algerian examples

- Dates and date-derived products
- Olive oil and olive pastes
- Cereals: wheat, barley, sorghum
- Aromatic and medicinal plants

These systems help create high-value products suitable for local consumption and export.

2.3. Circular Food Economy

The circular food economy reuses agricultural and agro-industrial by-products to reduce waste and create added value.

Examples

- Date pits → flour or animal feed
- Olive pomace → organic fertilizer or energy
- Fruit and vegetable residues → compost

Benefits

- Reduced use of chemical fertilizers
- Lower waste-disposal costs
- Improved soil quality

3. Non-Conventional Agricultural Techniques for Algeria

These techniques are practical, relatively affordable, and already partially implemented in several regions of the country.

3.1. Greenhouse Agriculture

Greenhouses enable year-round production by controlling temperature, humidity, and pest exposure.

They are widely used in coastal and inland regions for crops such as tomatoes, peppers, and cucumbers.

Benefits

- Higher productivity
- Reduced pesticide use
- Efficient water and nutrient management

3.2. Hydroponics (Soilless Agriculture)

Hydroponics allows plants to grow in nutrient-rich water instead of soil.

Low-cost hydroponic systems are suitable for Algerian households, rooftops, and small farms.

Advantages

- Saves 70–90% of irrigation water
- Produces high yields in limited space
- Reduced exposure to pests and soil-borne diseases

3.3. Water- and Soil-Conservation Agriculture

This includes several resource-saving techniques :

a. Drip Irrigation

- Highly efficient water use
- Reduced irrigation losses
- Already widespread in Algeria

b. Conservation Agriculture (No-Tillage)

- Maintains soil moisture
- Reduces erosion
- Suitable for cereal-producing regions

3.4. Simplified Organic Farming

This approach refers to a practical and low-cost version of organic agriculture adapted to local conditions, rather than the expensive international certification model.

It involves:

- Adding organic matter to the soil
- Reducing chemical pesticide use
- Using natural predators and plant extracts

This method improves soil fertility while reducing production costs.

4. Practical Solutions to Fertilizer and Pesticide Problems

4.1. Organic Fertilizers & Compost

Organic fertilizers improve soil structure and increase its nutrient content.

Main sources

- Poultry manure
- Livestock manure
- Compost from fruit and vegetable waste

4.2. Biofertilizers

Biofertilizers contain beneficial microorganisms that enhance nutrient uptake and reduce the need for chemical fertilization.

Examples

- *Rhizobium* for legumes
- *Azotobacter* for cereals
- Mycorrhizal fungi to improve water and phosphorus uptake

4.3. Biological Pest Control

Biological control provides a safe alternative to synthetic pesticides.

Examples

- *Bacillus thuringiensis* (Bt) against caterpillars
- *Beauveria bassiana* against insects
- Ladybugs against aphids
- Pheromone traps for monitoring pests

4.4. Integrated Pest Management (IPM)

IPM combines multiple control methods to minimize pesticide use while maintaining crop health.

Components

- Field monitoring
- Light traps
- Limited and targeted pesticide application
- Use of natural predators

4.5. Botanical Pesticides

Botanical pesticides are plant extracts with natural insecticidal properties.

Examples

- Neem extract
- Thyme extract
- *Artemisia* extract
- Garlic extract

5. Logical Integration of All Components

To develop a fully functional non-conventional agricultural and food system in Algeria, the following steps can be combined:

1. Promote local food systems (dates, olive oil, cereals).
2. Implement efficient agricultural techniques (greenhouses, hydroponics, no-tillage).
3. Replace part of chemical fertilizers with organic and biofertilizers.
4. Reduce pesticide use through biological control and IPM.
5. Apply circular-economy principles by reusing agricultural waste.

Conclusion

Non-conventional food and agricultural systems represent practical alternatives to traditional systems, capable of addressing the major challenges facing Algeria, including limited water resources, soil degradation, and excessive dependence on chemical inputs.

These systems—such as short food supply chains, circular food economy, hydroponics, greenhouses, simplified organic farming, and biological pest control—contribute to improved productivity, better product quality, and enhanced environmental protection.

The integration of these approaches strengthens local food security, reduces production costs, and improves the efficiency of natural resource use, making them realistic and applicable solutions for Algeria.

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