

## **Sustainability of typical quality products for food and nutrition security in the Mediterranean: Lessons from the case of Apulia region in Italy**

**Cosimo Lacirignola**  
CIHEAM Secretary General



**Francesco Bottalico**  
Consultant and Researcher, CIHEAM-Bari



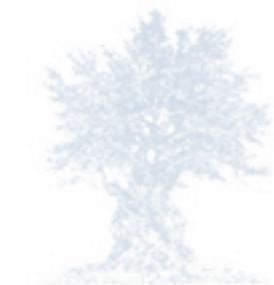
**Roberto Capone**  
Principal Administrator, CIHEAM-Bari



**Hamid El Bilali**  
Consultant and Researcher, CIHEAM-Bari



**Philipp Debs**  
Consultant and Researcher, CIHEAM-Bari



## **Relation between food security and food system sustainability**

Food consumption patterns are critical for sustainability. Current Mediterranean food consumption patterns are not sustainable and are putting increasing stress on Mediterranean ecosystems and social systems. They are important drivers of environmental degradation. The social and economic costs of diet-related illnesses are straining individuals, families and national healthcare budgets (Capone et al., 2014). There are strong linkages between food security, responsible environmental stewardship and greater fairness in food management. They intersect in agricultural and food systems at global, national and local levels. A sustainable food system supports food security. Changes in both food consumption and food production are important to ensure more sustainable food systems and to achieve food security in the Mediterranean region. Diets sustainability is crucial for achieving food and nutrition security (Capone et al., 2014b).

There is today a better understanding of what characterizes unsustainable food systems and why this unsustainability is the main reason for the existence of food insecurity and nutrition: if food systems do not perform adequately in their environmental, economic and social dimensions, food security and nutrition are threatened (HLPE, 2014). According to the High Level Panel of Experts on Food Security and Nutrition (HLPE), sustainable food systems should ensure food security and nutrition for present and future generations (HLPE, 2014a). According to the Rome Declaration on Nutrition, one of the main outcomes of Second International Conference on Nutrition (ICN2), all components of food systems - including production, processing and distribution - should be sustainable, resilient and efficient in providing more diverse foods in an equitable manner, with due attention to environmental and health impacts (FAO and WHO, 2014).

Sustainable diets are the cornerstone of sustainable food systems while diets are in turn based on a series of agro-food products that are consumed in a certain way so integrating not only nutritional aspects, i.e. meeting dietary needs, but also socio-cultural ones reflecting personal and collective food preferences.

### **Activity background and context**

Agriculture & Quality is a programme of Apulia Region supported by CIHEAM-Bari. Its main objective is the enhancement of typical food products of the Apulia region (Region of Puglia, 2010), through the creation of the quality scheme "Prodotti di Qualità Puglia" (Quality products of Apulia, PdQP). In the framework of the programme, CIHEAM-Bari has started a pilot project to assess the sustainability of the products belonging to the quality scheme in order to ensure that these products comply not only with the quality requirements detailed in product specifications but also with sustainability requirements. Specifically, the aim of this activity is to develop guidelines and a methodological approach (with appropriate indicators) to assess the environmental, economic, nutritional-health and socio-cultural sustainability of the Apulian quality typical products, which are the cornerstone of the regional Mediterranean diet and food system.

One of the challenges for Apulian and Italian agro-food products is to combine tradition and innovation, ensuring not only production quality but also sustainability. The agro-food supply chains have to generate positive impacts for the producers and the territory. To ensure obtaining a product that can be defined sustainable it is necessary to shift attention to the production processes. The pilot project is one of the activities started after the international seminar on Mediterranean food systems sustainability organized by CIHEAM and FAO in Malta in 2012. It is carried out in collaboration with the Research Centre on Food and Nutrition (CRA-NUT), the National Research Council (CNR), the National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), the Forum on Mediterranean Food Cultures (FMFC), the University of Bologna and the University of Naples Federico II.

### **Methodological approach**

The starting building blocks for methodological approach elaboration were the results of the international workshop on diets' sustainability, held at CIHEAM-Bari in November 2011, and the conclusions of the international seminar held in Malta in September 2012 (Lacirignola et al., 2012; Derrini et al., 2013). It was decided to use the term "sustainability" only when all the three pillars are considered (environment, economy and society-culture), supplemented by the nutritional-health component. The environmental pillar includes biodiversity while the socio-cultural pillar comprises also ethical aspects.

The methodological approach development was based on the adoption of a hierarchical approach (cf. FAO, 2013) i.e. from sustainability themes to indicators for each dimension/pillar. Sustainability is assessed separately for each of the four pillars (environmental, economic, socio-cultural and nutritional-health) and each of them has the same weight as the others. For each sustainability pillar some criteria/themes were identified and for each criterion have been selected some indicators that are suitable and measurable at corporate level, for each agro-food supply chain. The selection of indicators should be considered just a phase of the methodological approach development that includes the following tasks: justification of the choice of sustainability themes and indicators based on the concept of sustainability; description of indicators (cf. indicator sheets); and development of a method for the aggregation of indicators. The selection of sustainability criteria and themes was based on the understanding of agro-food sustainability for each pillar and the characteristics of a sustainable agro-food product and/or a process.

The identified indicators must be well defined, relevant, specific and easily measurable at farm level, appropriate and easy to understand and communicate to all stakeholders, including farmers, politicians and consumers. In line with SAFA approach (FAO, 2013), different types of quantitative and qualitative indicators were considered: performance-based, practice-based and target-based. Most of the developed indicators refer to products (cf. product-based approach) but some of them refer to the producing farms/companies (cf. corporate-based approach) as they are not specific to single products and depend on the whole management of the agro-food company.

For each indicator a sheet was prepared including the following information: definition of indicator; method of calculation; sustainability benchmark; and other useful information (e.g., applicability of the indicator to different types of products, links with other indicators, references). The sustainability benchmark value, which is defined for each indicator and for each supply chain, expresses in a simple, objective and numerical way the threshold of sustainability beyond which a product, and/or the company that produces it, can be considered sustainable. This value is defined taking into account the average performance of the Apulian agro-food enterprises.

The methodological approach can be applied to who demand, from the regional authorities, the use of the additional requirement "sustainability" for the products that adhere to the regional quality scheme or to other quality schemes recognized at EU level.

### **Sustainability pillars: themes and indicators**

#### *Environmental pillar*

Environmental sustainability is the capacity to preserve the three environment functions through time: i) as supplier of resources, ii) as receptor of waste and iii) as direct source of goods. Environmental sustainability is also meant as the capacity to add value to the environment of the community area, while ensuring the protection and renewal of natural resources and heritage. Considering sustainability in relation to the environment and the natural resources means taking into account the impacts that the production processes may cause, the use of low impact cropping practices and tools, and the presence - within the businesses - of plans, policies or environmental monitoring systems involving the achievement of environmental objectives towards environmental sustainability.

Special emphasis is to be laid on agro-biodiversity, by applying an ecosystem-based approach taking into account the preservation of the agricultural landscape as well. Biodiversity is meant from a genetic and nature point of view and is both an environmental sustainability index and a resource to preserve. Biodiversity is to be managed and preserved at various levels, from the plot to the farm agro-ecosystem, through the ecological infrastructures that ensure the presence of on-farm associated biodiversity and contribute to the supply of environmental services.

The supply chain should commit to implement an environmental management system targeted to reduce the environmental impact and preserve biodiversity. The main objectives are to improve the efficiency in the use of resources, above all water resources and energy, as well as chemical inputs (fertilizers, pesticides). Inevitably agriculture has a significant impact on the soil; for this reason it is requested to adopt all measures and techniques aimed at reducing any form of degradation and soil impoverishment by using cropping techniques and a proper fertilization plan. Pollution should be minimised and production by-products and waste should be managed in a responsible way and, where applicable, recovered, re-used or re-cycled. It is also important to favour a farm and chain organization keen to reduce losses throughout the agro-food chain.

With regard to the environmental pillar of sustainability, proposed indicators include the following:

- Crop species and cultivar diversity
- Use of local crop cultivars and animal breeds
- Share of semi-natural habitats surface
- Soil improvement practices
- Soil erosion protection practices
- Soil compaction from machinery
- Rotation duration
- Nitrogen fertiliser consumption
- Plant protection products input
- Direct and indirect energy consumption
- By-products and waste management practices

#### *Sociocultural pillar*

Social sustainability is defined as the capacity to ensure equity in life quality and human well-being conditions, independently of class and gender. It involves workers, entrepreneurs, citizens-consumers and local community in a general sense. Within a community-based system, social sustainability is meant as the community's ability to operate together, effectively, sharing the same concept, encouraged by concerted efforts. The sociocultural pillar should be framed within the sociocultural context in which it is applied. As to the food-related cultural dimension, it is important to take into account the community's own distinctive and traditional elements that form its original identity.

Food products and the businesses may be considered as sustainable from a sociocultural point of view if they satisfy the following requirements:

1. Access to the resources, social services and human capital based on equity among social groups, actors and between men and women involved in the agro-food chain;
2. Cultural value recognized by the community (use of local resources, unicity in the production history and tradition, shared knowledge at the local level, close link with the community-based area, etc.);
3. Product capacity and potential to maintain its sociocultural peculiarities over time, to spread among present generations and be handed down to future generations.

Sociocultural criteria concern, among others, the protection of workers (safety and health conditions at work, training and skills) and the world of relations (community, legality, family, transparency and communication due diligence) as well as animal welfare. In fact, actors should commit to implement an ethically sustainable management system through the whole chain. It must also be ensured to prevent discrimination practices.

Skills and knowledge of operators, including workers, should be fostered by means of training courses. In this area it is important to encourage all initiatives aimed at favouring women's involvement in work and the social inclusion of the most vulnerable groups of the local community.

The chain should put in place communication actions to involve the local community thus contributing to create channels for the exchange and dialogue on production activities, their impacts and externalities. Incentive and encouragement measures should be taken to support the establishment of farmers' organizations or associations not only to improve the quality of local products and keep them competitive on the market, but also to facilitate social relationships between the different chain actors.

Since sustainability also means maintaining the culture and local traditions over time, it is important to promote typical and traditional products as elements of identity formation and to transmit their value and the knowledge related to them to the new generations.

Based on the above, the sociocultural indicators taken into account include the following:

- Voluntary integration of and sensitiveness to social concerns and issues
- Presence of women in production and management contexts
- Social inclusion of the most vulnerable groups and people of the community
- Good relations with and involvement of local communities and authorities
- Social capital of agro-food companies
- Corporate social and ethical responsibility
- Farm activities to promote typical products as an expression of local identity
- Adoption and safeguarding of traditional production methods for quality typical products
- Transmission of knowledge to new generations
- Training of workers along the supply chain
- Inclusion of foreign workers
- Animal welfare (only for animal husbandry farms)

#### *Economic pillar*

The economic sustainability is defined as the capacity to generate durable growth of economic indicators, notably the capacity to generate income and employment for the livelihood of populations. In a community-based system by economic sustainability is meant the capacity to produce and maintain within the community area the highest value added, by combining resources effectively, with a view to enhancing the specificity of products and community services.

The economic sustainability of a product or an agro-food chain is the capacity to generate income and employment on a continual basis through production, processing and distribution activities. This would derive, on one hand, from the capacity to improve production techniques so as to cut production costs and increase the production efficiency and, on the other, from the ability to improve quality standards from a commercial point of view, while maintaining the intrinsic features of the original product.

One of the main sustainability criteria concerns labour profitability as well as the revenue-generating ability of other production factors (i.e. land, labour). Another important factor is productivity, meant as the effectiveness by which agriculture and the food industry convert the production factors. The rise in productivity means that higher yield may be obtained using the same amount of production factors.

Another element of sustainability is related to the correct and effective transmission of prices and distribution of the created value along the components of the agro-food chain with income-stabilising consequences both for entrepreneurs and workers. This enables an equitable allocation of the added value among the operators, thus strengthening the relational links within the community area and greater stability in trade.

Another important element for economic sustainability is the propensity to investment both for the corporate development and the positive externalities for the local economy. The latter element is crucial for sustainability because the corporate activity durability may be ensured only through investments in technical and organisational innovations.

As for the economic sustainability, proposed indicators and indices include:

- Diversification index: number of company products and services, distribution of revenues between different company products and services, heterogeneity of offered products and services
- Index of commercial risk (suppliers and customers)
- Localisation index (distance to main raw materials suppliers and consumers)
- Incidence of specific investments for improving sustainability performance
- Family work profitability index
- Index of gross profitability per working unit
- General profitability index
- Product valorisation index (value added / production value)

#### *Nutrition-Health pillar*

Agro-food products are sustainable from a nutritional-healthy point of view if they meet healthiness (safety and hygiene standards) and quality criteria (organoleptic, nutritional and dietary characteristics). The actors of the certified chain should undertake to reduce the addition of saturated fats, trans fats, sodium and sugars in processing. Moreover, these actors should supply information and nutritional advice, indicated in the label, on the optimal consumption frequency and the recommended intake amounts for each typical product. This should be implemented to ensure transparency and traceability.

Food quality and safety within a business is not a merely technical issue but is related to organizational and management aspects that involve the whole business. Quality should involve a corporate choice so that the quality level requested by the customer can be achieved on a permanent basis, rather than sporadically. The criteria of nutrition-health sustainability range from the obvious applications of current regulations and mandatory prerequisites (e.g. HACCP system, traceability, labelling) to a series of certifications and voluntary requirements - held by the business - that enhance its value added.

With regard to the nutrition-health pillar, the minimum criteria taken into account include: food safety (compliance with safety and hygiene requirements); quality (quality of raw materials, organoleptic properties); traceability; transparency of label information about the nutritional quality of fresh and processed produce as well as nutritional advice to consumers and on sustainability.

### Concluding remarks

A growing body of evidence shows that there can be no food security and nutrition without improving the current food systems sustainability. Therefore, any future initiative on food and nutrition security should embrace the sustainability paradigm, involve all the relevant actors along the food chain, create linkages with the existing multi-stakeholder processes and develop a multi-faceted research agenda. Achieving sustainable food security will require getting the priorities right and acting upon them. These priorities should necessarily include transition towards more sustainable food consumption patterns and diets. The focus on sustainable diets - based on high quality typical, local and seasonal agro-food products -integrated in a wider food system is original in this sense.

The present pilot project has contributed to the development of a methodological approach for the assessment of quality agro-food products sustainability. The methodological approach will be improved and refined by calculating contextualized sustainability benchmark values for all indicators; developing an appropriate rating/scoring system to ease the aggregation of indicators within sustainability pillars; and validation on Apulian typical quality products and supply chains.

Furthermore, in view of Expo Milan 2015, on April 23-24, 2015, CIHEAM-Bari will organize in collaboration with FAO an international workshop entitled "Mediterranean Sustainable Food Systems - Towards Expo Milan 2015; From Theory to Practice: Linking Territory, Food Quality Production, Food Consumption and Dietary Patterns for Improving the Sustainability of the Mediterranean Diet. Apulia Case Study"

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