

FOOD HETEROGENEITY, ENVIRONMENTAL IMPACT AND CHALLENGES FOR ITS MANAGEMENT IN ARGENTINA.

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The heterogeneity of food consumption is a global phenomenon represented by the growing importance of diverse production, distribution and consumption of food by the determined group and social actors (Cattaneo and Bocchicchio, 2019). It is a process related with “Food Supply Networks”, captured in the innovative form of production, distribution and food consumption, that questions their industrial production and the risks generated, proposing a more decentralized independent food system, oriented towards communities and emphasizing sustainability (De Bernardi et al., 2019). Among other modalities in Argentina, the production of organic and/or agroecologic food is expressed, using varieties and seeds adapted to the local conditions, preferring short commercialization channels (local markets and neighboring businesses), in the revaluation of ethnic and typical food and specially in the growing importance of sustainable diets, a concept that includes those that could be beneficial to the health of the consumer as well as to the environment.

Environmental considerations play an outstanding role in all these manifestations, together with cultural value, food safety and support to domestic economy (Nemecek et al 2016). It shows that food identification with the sum of calories, vitamins and nutrients that must be incorporated to the organism of the human beings to guaranty survival, has evolved towards the idea of products inextricably linked to the generating processes, caring for the environment and public health (specially related to cardiovascular, obesity and malnutrition problems that come with the consumption of excesses of grease and carbon hydrated) (Renting and Wiuskerke, 2010). Food, on the other hand, has emotional and psychological values, gives pleasure through taste and aesthetic presentation, playing a defining role in terms of culture and is vehicle for social interaction (Heller et al, 2013).

In the broadening scope of what food represents, and the emphasis in its sustainability it represents a big challenge when designing and applying methodology criteria for an adequate evaluation in the impacts to the environment (EIA) that they generate. Risk evaluations on food matters no longer only remit to the considerations of aspects linked to the safety of food and health, but increasingly incorporate other topics (*non health* aspects) linked to food security, such as the sustainability of the productive processes, among others. Therefore, a detailed consideration of the economic, social and environmental impacts, seem to be incorporating more and more often, when developing methodologies that permit these evaluations to be taken (Dreyer et al. 2010). But there are also some limitations: difficulties evaluating sustainability in all its dimensions (environmental, economic and social), with the risk of omitting impacts in some items, or including progress, observed in others of lesser relevance, and to share and compare results between the different chains, networks and actors that work in different geographic and temporal spaces and that use different methodologies and instruments (Alroe et al, 2016) are some of them.

Consequently, the conjugation of all aspects involved in food sustainability is revealed as a very complex exercise; one example of this is when we are confronted with the widespread impression that diets that are environmentally sustainable are also healthy, when in reality in many cases we observe the existence of “*trade-offs*”, that do not permit that this correlation is verified (Heller et al, 2013). Recent studies have demonstrated that the production of organic beef generates a similar amount of greenhouse gases, as if produced in conventional ways, due to the reduction of GEI as consequence of the lesser use of synthetic fertilizers in organic production ends up being compensated by the need of more animals to achieve similar levels of production in relation to conventional systems (Pieper et al, 2020). On the other hand, several studies that compared food prepared in the home environment with those semi-elaborated or ready to eat

(industrialized food), have found that the differences in terms of environmental impact were insignificant between them (Heller et al, 2013). Controversies also arise when considering the advantages of a greater presence of fish in the diet with contamination problems of the environment registered in many salmon farms: while scientific evidence show that, in nutritional terms, the increase consumption of fish is beneficial to health, the analysis of these water production systems from a toxicology perspective exposes the risks to the population and the environment (Dreyer et al, 2010).

On the other hand, the application of the Life Cycle Evaluation (LCA) represented by Norms ISO 14.040 and 14.044 in agriculture and the production of food, though acquiring more relevance each time, has many aspects to be resolved (among which are the definition of a functional unit that includes nutritional aspects, related to food and health security) due to the complexity implied in the link between nature and the technical sphere found therein (Heller et al, 2013). Evaluation of sustainability in the long term of diets, demand impact measurements that go beyond de LCA, and considerations of the excessive use of fossil fuels and GEIs emission: the “simultaneous” evaluation of the positive and negative impacts of the different aspects involved in the food sustainability concept, becomes a difficult task and the results obtained are not exempt of questions and doubts (Heller et al., 2013). Due to the diversity of the variables that intervene, the differences in the environmental impact of production and food consumption thus end up forming a “wicked problem”, concept that describes an inconvenience difficult or impossible to solve given that they present incomplete, contradictory and/or changing inconveniences that in many cases are difficult to recognize (Heller et al, 2013).

Along the same line, Nemecek et al point out sustainability as one of the greater challenges in the environmental evaluation of nutrition, and Alroe et al argue that evaluation of sustainability cannot be carried out from a sole perspective of analysis, emphasizing the differences of ideas and values that the

intervening actors have about what is considered a better food system, which derive in different logics that lead to different types and forms of evaluations. Thus they emphasized the multifaceted character of the concept of sustainability and its links with the different areas of scientific knowledge and its practice (Alroe et al, 2016).

This wide diversity is also correlated with an increment of the uncertainty, risks and environmental impacts of different types, and the proper evaluation of these issues requires that one go beyond the sectorialization of the EIA, which makes it necessary to focus on the application of the precautionary principle in agro-food matters. This emerged in Germany, during the 70s in the field of the environmental law; in Europe it has been incorporated in the food ambit through the (EC) Ruling 178/02. In Argentina`s case, it is integrated to the legal framing with the General Environment Law No. 25.675 of 2002, which provides that “*when there are threats of serious or irreversible damage, the absence of information or scientific certainty shall not be used as a reason to postpone cost effective measures to prevent environmental degradation*”, although it is recognized, that even for social demands for better decision making spaces, in the face of precautionary hypothesis, Argentina has been more important at the judicial level than at serving as a basis for risk decision making (Berros, 2013).

A greater consideration of the precautionary principle leads to the need of restructuring and redefining of the agro-food control agencies; it is necessary to take into account that the characteristics of food and healthy consumption put these structures under stress, as they present an institutional design that responds in a large extent to the classic postulates of bureaucratic administration, with the limitations it presents to address management of uncertainty and the application of the aforementioned principle, in cases where the scientific evidence is not total, and the seriousness of the danger of harm warrants it. (Todt and Gonzalez, 2007; Moreno Plata, 2011). In addition, the differences in the evaluation methods of the impact infringes against its implementation in practice, because sustainability

assessment are basically carried out by experts and the implementation processes require changes in practice that involve the participation of other actors. Another complex aspect is presented when trying to design and implement regulatory frameworks in a scenario of multi-criteria evaluation that take into account the precautionary principle.

It is also considered that the political actors involved therein are not limited at present to government agencies and organisms that rule the productive aspects of agro-food, but other public dependences are being incorporated (environmental, health, education, etc) together with NGOs and representatives of the civil society, without focusing on certain productive aspects, that strive to play an increasingly productive role in the definition of policies and regulations in this area. An adequate risk governance, requires a strong food risk management system to avoid the “socio-political ambiguity” defined within the governance of risk as manifestation of divergent or contrasting perspectives in the justification of the “meanings” associated with a given threat in relation to the issue. This is expressed, among others, at institutional level, through the disagreements of the different agencies dependencies, with regulatory capacity, in aspects that transcend its specific competence, due among other causes, to the existence of uncertainty in scientific matters (Dreyer et al, 2010). The conflicts that exist in many cases in rural zones of Argentina among producers and environmentalists organizations, and among other units that rule determined productive aspects (ex. the application of agro-chemicals) and those of the environment can be analyzed at the light of this concept.

We can conclude affirming that difficulties in the agro-food field persist when “translating and adapting” the definition of sustainability in its triple meaning to EIA methodologies, that permit its adequate implementation in operative terms of governance, the apprehension and framing of such diverse issues in a protocol

that is adaptable to all these forms, and responds to all the logics at play and that often enter in conflict is thus difficult, although rules have been made in standard procedures with the purpose of evaluating the different diets, as is the case of ENVIFOOD (Heller et al 2013). The materialization of *ad hoc* procedure, on the other hand, reveals little functionality and it is difficult to manage and control.

Assumption that nutrition is a significant contributor to the total environmental impacts of food consumption (Nemecek et al 2016), requires moving towards a more conceptualization of what health entails when integrating nutrition with more environmental considerations. Likewise, more and better data bases, and methods of analysis must be available that give nutritional qualities to the environmental impacts of different food alternatives (Heller et al 2013). Adequate communications criteria mechanisms should also be implemented, on which the different evaluations are based, and its relationship with the knowledge and values that underpin them (Alroe et al, 2016) for information to reach the stakeholder, specially policy makers and consumers. It is also important to develop instances that promote cooperation between actors at different scales (local, regional, national and global), and a greater incorporation of transdisciplinary approaches in the analysis of these issues.

Consequently, in countries such as Argentina, the challenge for the EIA to grasp the multiplicity of agro-food formats and modalities, present and to generate evaluations instruments and mechanisms, adequate and functional to this diversity and are integrated in governance systems that permit a sound management in terms of the interest and demands of society, is still pending.

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