Shedding light into the elephant:
The case of the Chilean bread-wheat eco-agri-food system

Bonilla-Muñoz, V.H.a, b*, Marín, C.c, d

The Right Livelihood College campus Austral.
Escuela de Graduados, Facultad de Ciencias Económicas y Administrativas,
Universidad Austral de Chile. Casilla 567, Valdivia, Chile.
Instituto de Ciencias Ambientales y Evolutivas, Facultad de Ciencias,
Universidad Austral de Chile. Casilla 567, Valdivia, Chile.
Instituto de Ciencias Agronómicas y Veterinarias,
Universidad de O’Higgins. Av. Libertador Bernardo O’Higgins 611, Rancagua, Chile.

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*Corresponding author:
Victor Bonilla-Muñoz
E-mail address:
victorbonillagt@gmail.com

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Healthy diets: reality or dystopia?

There is a solid consensus on the non-sustainability of the global eco-agri-food system (TEEB, 2018), given that it is responsible for 60% of biodiversity loss (Sukhdev et al., 2016), and fails to feed well 50% of humanity (FAO, 2018). This situation is exacerbated in Chile, with 65% of the population being poorly nourished (PAHO-WHO, 2018).

Bread is the main source of calories and proteins for all socioeconomic classes in Chile (Crovetto et al., 2014). Under this scenario, it is at least ambitious to guarantee healthy lives to achieve the sustainable development goals. The visualisation of the most critical aspect of the current contingency of the Chilean bread-wheat within eco-agri-food system would facilitate the dialogue towards food sovereignty, while giving sustainability to the Chilean bread-wheat value chain.

Are we blind people touching an elephant?

The Indian parable of “the blind men and the elephant” exemplifies the human inability to represent the complexity of a problem as a whole, which has been recognised as the growing difficulty faced by experts to communicate with each other and the general public (Nature Neuroscience Editorial, 2000).

This parable could explain part of the contemporary crisis experienced by the global and Chilean eco-agri-food systems over the last decade, since multiple experts from different areas of knowledge propose different solutions. However, experts from different areas should agree on the following facts: i) the planetary boundaries for mankind safe operating space have been exceeded and agriculture is the main responsible for altering, among other factors, the biogeochemical cycles of C, N and P (Campbell et al., 2017); and ii) 34% of humanity —a rising percentage since 1996— does not participate in the dynamics of capital accumulation in the current world economic model, being mostly excluded groups that live off agriculture —women and ethnic minorities— (The World Bank, 2008; ILOSTAT, 2014).

1 According to TEEB (2018: 18), the eco-agri-food system is a “...term for the vast and interacting complex of ecosystems, agricultural lands, pastures, inland fisheries, labour, infrastructure, technology, policies, culture, traditions, and institutions (including markets), that are variously involved in growing, processing, distributing and consuming food.”

2 The Sustainable Development Goals “...are a series of 17 internationally agreed, universally applicable goals that are recognized as indivisible and cover issues across the spectrum of development from poverty, food security and water security, through equity, health, access to decent work, peace and a stable natural environment.” (TEEB, 2018: 20).

3 This statistic seems conservative because in countries like Chile the unemployment threshold is overcome when a person of working age receives an income equivalent to 1 hour of work per week (INE, 2018a).
mainly based on the cornucopian paradigm, which in the world economic system developed since 1996 are according to their size (3.27 Mg ha\(^{-1}\) and 5.96 Mg ha\(^{-1}\), for the yielding gap between the different farm profiles across those with an area of less than 50 ha and their national yield record with 6.21 Mg ha\(^{-1}\). On the other hand, v) Cotrisa (2018) suggests that there is an apparent unfair competition in the milling link, since six owners concentrate 50% of the national grain production and replace national grain by imported grain at an annual rate of 3%. Therefore, small-scale farmers have little chance of participating in a truly free and competitive market as fragmented links, when it is clear that 60% of the mills account for 90% of the national milling capacity (Cotrisa, 2018) ; vi) since July 2009, there has been a sustained increase in the nominal prices of white bread (hallaulla) with a volatility in the real prices, equivalent to a variation coefficient of 4.56% (ODEPA, 2018), and vii) since August 2014, there is a decrease in the real prices linked closely to the drop in international oil prices recorded by EIA (2018), which recently rose again.

**Final thoughts**

The search for the sustainability of bread-wheat in Chilean eco-agri-food system is far from simple. A tangible challenge is related to the asymmetry existing in the links of the value chain, particularly the “bottleneck” of the grain transformer link and the dissociation generated by the price-forming mechanism, which leaves all risks to farmers and outsources the responsibility of the transformation, distribution and marketing links to the consumer. Apparently this is not isolated, since Nestle (2016) and citations within it report a similar phenomenon in the behaviour of US agribusiness agents who, in their legitimate search for maximization of individual profits, influence the agri-food policy, damaging public health and its corporate image. This would suggest that the efficiency of a value chain can not be explained only from the aggregate efficiency of its participants (Mozeris and Martinez, 2014).

Therefore, it is suggested that further studies are needed in order to rethink a space for institutional innovation and appropriate technologies that reconfigure the structure of vertical integration of Chilean bread-wheat business model. The latter could be evaluated using action-oriented research methods, documented in agroecological practices (Méndez et al., 2015) and human scale development7 (Guillén-Royo, 2016).

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1 According to Kaufman (2008), preadaptation is a transitory purpose of an open system, whose long-term performance is unpredictable due to the presence of transitory interrelations between their components.

2 The “cornucopian paradigm” indicates that prosperity arrives unexpectedly and without undesirable side effects, it assumes that the artificial capital has a perfect substitution with natural and social capital, and viceversa.

3 Sanford (2014) argues that the food crisis is fundamentally a crisis of conscience, and that part of the solution involves reconfiguring the human relationship with nature, through new paradigms that assess economic, social, and environmental food concerns with holistic frameworks, that for example faith-based perspectives can provide.

4 Human scale development is a proposal located within the critiques of development under the paradigm of progress and modernity (Gudynas, 2011), its central axiom argues that development is about people, not about objects, and presents a systemic theory of human needs for sustainability that highlights a clear conceptual distinction between needs and satisfiers of these needs (Max-Neef et al., 1991).
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