QUANTITY VERSUS QUALITY AND PROFIT VERSUS VALUES ? DO THESE INHERENT TENSIONS INEVITABLY PLAY IN ORGANIC FARMING?

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DO THESE INHERENT TENSIONS INEVITABLY PLAY IN ORGANIC FARMING?

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Abstract
The literature shows that the systems advocating the productivity relatively neglect the ecological services whereas those based on these services, as Organic Farming (OF), are generally less productive. Which balance between these two issues should be found and would contribute to a sustainable agriculture? OF as a value-laden agriculture, whose principles are based on ecology, equity, health and care appears as a candidate for combining performances. In the first section we show results at farm level on environmental and agro-economic performances. In the second section, we underline the challenges facing OF to confirm its prototype's position. OF as a heterogeneous entity presents different types of trade-offs between the performances. Some performances need an up-scaling approach to be confirmed. This up-scaling enables also a more global assessment integrating the externalities of conventional farming that OF tends to internalize. Finally we conclude that other criteria should also be considered to better take into account the values and the long terms sustainability, because the contemporary systems have been constructed on optimizing productivity and maximization of short terms yields.

Key Words : agro-economy, performances, agroecology, values.

INTRODUCTION

Several authors argue that conventional agriculture is not sustainable and that radical changes are needed (e.g. Pretty et al., 1995). Moreover, the last decade provides evidence of stagnating or diminishing yields despite the rapid increases of chemical pesticide and fertilizer applications, resulting in lower confidence that these high input technologies will provide for equitable household and national food security in the next decades (Sanders 2006, El-Hage Sciabella, 2007). Although the extent of the necessary changes may be questioned, there is a general consensus about (i) the society's desire to internalize some of the externalities of agriculture (Buttel, 2003) and (ii) the recognition of the multiples facets of performances of today's agriculture considered as multifunctional (Stobbelaar et al. 2009). The agriculture of tomorrow will have to face numerous stakes: production increase and its accessibility for food safety, conservation of the biodiversity, climate change, soil protection, water storage, etc. Are all these performances compatible? Will the yield's increase be made to the detriment of the quality of the products, water, and soils? It seems necessary to organize these objectives into a hierarchy and to identify candidates' models.
Many authors suggest that Organic Food and Farming (OF&F) may provide solutions to the current problems in conventional agriculture (Lotter, 2003, Bengtsson et al., 2005) and OF&F has often been suggested to be a new paradigm in agriculture (Beus & Dunlap, 1992). Busch (1994) suggested that public agricultural research is at an impasse partly because of the continued hegemony of the key goal to increase productivity (Chrispeels & Mandioli, 2003). Since about twenty years at least, recurring questioning on the dominant model of agriculture leads to the raise of the ecology in the field of the agriculture and the agronomy sensu lato (Cauderon, 1981; Griffon, 2006). Ecological engineering suggests that the relationship between short term productivity and sustainability will inevitably be negative, and considers production strategies in terms of "trade-offs" (Weiner, 2003).

OF&F which carries values -ecology, equity, health and care (IFOAM, 2005) - can be considered as a model of value-laden agriculture, going beyond classical agro-economic performances, and managing this tension between profit and these previous values. But OF&F is also sometimes considered as not been productive enough, and the supposed systematically lower yields following conversion are pointed as an obstacle for farmers adopting OF. However, yield increases would create a conflict of objectives in OF, shifting it from an ecologically-based farming through an intensification process relying on external inputs. This process is also called "conventionalisation" of OF&F (Darnhofer et al., 2010). On the other hand, in conventional farming, attempts to maintain yields close to their current high levels while improving the sustainability are manifold.

Such low-input or ecological strategies can be related to “organification”, as a counterpart of “conventionalisation” (Rosin & Campbell, 2009). We assume that beyond formal oppositions or potential bifurcations among production patterns, these two approaches can converge by the incorporation of the idea of long term sustainability into overall agroecosystem design and management.

In a first section, we address the various orders of OF&F performances. In a second section, we analyze the limits of those issues. We begin with the fact that OF&F recovers a gradation of situations, in terms of profit, and values. Then we underline that the scale as well as the criteria of assessment are in question. Finally, combining upper-scaling and other criteria enables to approach global benefits, in the way OF internalizes externalized costs.

1. OF, A “PROTOTYPE” OF CONCILIATING PERFORMANCES?

The scientific community agrees on the necessity of combining various indicators to report productive, environmental and social performances of the farming. The studies linking these three orders of performance are still rare (Groot et al. 2010; about twenty references identified on CAB abstracts).
Organic Food and Farming (OF&F) appears *a priori* as a good "model", it is at least what is expressed by the OF proponents and the public authorities. The European regulation stipulates clearly: OF&F plays a dual societal role, where it “on one hand provides for a specific market responding to a consumer demand for organic products, and on the other hand delivers public goods contributing to the protection of the environment and animal welfare, as well as to rural development” (CE 834/2007).

In France, OF only represents 2.12 % of the land area and 2.6 % of the French farms (French Organic Agency, 2008) with strong differences according to regions. For a long time considered as marginal, OF benefits today from support and behalf of the public authorities and consumers. The recent reflections on the environmental problems during the French “Grenelle de l’Environnement[1]”, gave rise to political decisions translated in a multiannual plan of "organic food and farming development - Horizon 2012" (Barnier, 2007). This plan aims in particular at the tripling of OF certified land areas from 2 % to 6 % in 5 years (until 20 % in 2020). A fund called "Organic Future" endowed with 3 million / year during 5 years was also set up for a better structuration of the organic sectors. The market of the consumption of organic products registers every year since ten years an annual average growth of 10 %. In spite of these encouraging data, the French Organic Agency indicates that in 2008 the national production was not able to satisfy the market: 30 % of the consumed organic products were introduced from country of the UE or imported (from third country).

1.1 Quantity versus quality and ecological value

1.1.1 Environmental performances

Although OF is based on ecological principles, the relations between OF and environment were studied. The OF’s effects on environmental compartments were estimated with various methods (e.g. Hansen et al., 2001; Van der Werf & Young, 2002). They are often considered as positive (Stolze et al., 2000; Alföldi et al.,

[1] The State and diverse representatives of the civil society were gathered for the first time to define a road map in favor of ecology and sustainable development.

2002; Blanchart et al., 2005; Kasperczyk & Knickel, 2006; Fleury et al., 2010), in spite of discussions relative to the robustness of the comparisons (Trewavas, 2004; Bergström et al., 2008) and to the used units of evaluation (area or volumes of products) in particular for greenhouse gas emissions (Aubert et al., 2009).
However, problems differ according to the concerned compartments. OF's contribution in the conservation of water ressources is still an issue to be studied (Benoît et al., 2003; Caylet, 2009). Concerning the use of energy, the OF farms would be more efficient (Hansen et al., 2001) even with lower yields than in conventional, which is essentially explained by the no use of chemical fertilizer and pesticides. OF's effects on the biodiversity were object of meta-analyzes, showing the positive effects of OF (Bengtsson et al., 2005; Hole et al., 2005). OF is also mobilized into expertises supporting the objectives of reducing the use of pesticides (Ecophyto R*D). However strategies are sometimes based on logics of replacement with IFT (Indicator of the Frequency of Treatment) sometimes higher than in conventional (Penvern, 2010), because of the repeated application of a limited number of natural products which are not harmlessness on biodiversity. And the efficiency are questionable, even generators of resistances (Sauphanor and al., 2009).

A functional approach of biodiversity in OF remains to be built particularly in terms of effective biological control (Letourneau et al., 2008), pollination (Knickel & Kasperczyk, 2009), and agro-ecosystem functioning (Weibull et al., 2003; Francis et al., 2009). Environment has also to be considered as a factor of OF's development and orientation (Fleury et al., 2010). Eco-functional intensification is advocated in OF Research Agenda. Based on an increase of the beneficial effects of the ecosystem's functions, including biodiversity, soil fertility and homeostasis, it tends to (i) use the mechanisms of auto-regulation of the biological or organizational systems, (ii) close the cycles of the materials as to limit the losses (for instance composting), (iii) look for the best adequacy between environmental variations and genetic variability; and (iiii) also increase the well-being of the animals of breeding with a positive impact on their productivity and health. It needs to use more knowledge to obtain a higher degree of organization by unit of surface (Niggli et al., 2009).

1.1.2 Agronomic performances

1.1.2.1 Quality of OF's products

Although OF environmental aspects have been largely supported in the scientific literature, its food quality benefits have remained a point of debate between many authors (Dangour et al., 2009, Lairon, 2009). The extensive literature on the food quality differences between organic and conventional produce provides some evidence overall that organic produce is of a higher quality. In particular, the empirical evidence suggests organics offers less contaminant levels in its food (e.g., Baker et al., 2002); higher levels of ascorbic acid (e.g., Magkos et al., 2003); higher levels of plant secondary metabolites (e.g., Birzele et al., 2002, Brandt et al., 2004, 2006); higher antioxidants (e.g., Benbrook, 2005); increased phenolic metabolites (Tarozzi et al., 2006); and lower levels of nitrate (e.g., Woese *et al.,* 1997).
It is less informed for animal products, with a significant effect of the food on the nutritional and sensory quality of the products (Bellon et al., 2009). For instance in ovine breeding, the OF regulations impose lambs breeding with grass during the season of pasture which is favorable to the value health (Aurousseau et al., 2004, Prache et al., 2009) but can lead to lesser butcher and sensory qualities of the meat (Rousset-Akrim et al. 1997; Funols et al ., 2009).

1.1.2.2. The quantity issue: what about the OF's yields?

First it is important to take into account the temporal gap of the response of the ecosystem managed in an ecological way (for instance soil fertility). Kilcher and Zundel (2007) show it takes years after a conversion to get back to the yield which was observed with the conventional practices, and this could take all the more time as the previous system was more intensive.

Worldwide higher-order studies gives information about organic yields from multiple sources (Stanhill 1990; Lampkin & Padel 1994; Pretty 1995; Stockdale et al. 2001; Liebhardt 2003; Lotter 2003; MacRae et al. 2008). Globally plant yields in organic systems are, on average, 10% below conventional systems. Such averages do vary between extensive and intensive systems because the conventional reference is different. In Europe, where conventional production is very intensive, organic system yields look comparatively weaker than in extensive systems such as those found in North America and Australia. In these regions, organic crop yields generally range from 20% less to slightly more than that of conventional systems. In Europe, they can be 20 to 40% less, respectively, except in forages where the range is more likely 0 to 30% less (Stockdale et al. 2001).
In a study (Sanders, 2007), average yields for organic crops are compared in percentage of the conventional yields for 5 European countries, showing that the French organic yields are much lesser than the organic ones (about 50 % less, in comparison with only 30 % less in Austria), but it depends first of the conventional average situation in terms of intensification, and second on the "penetration of OF" in the country: with 9% of organic crops in Austria, the average integrates more intensive farms than in the 1, 3 % of French organic crops land area. Furthermore, we can assume that OF is not present in the heart of the cereals regions when concerning only a very few farms.

Nevertheless, although an important element, yields alone do not indicate profitability. Already in the 1980s, experiments comparing 2 technical wheat practices with one decrease of yield of 15 quintals /ha compared to the other one allowed to show that yields could decline without decreasing the margin gross, thanks to the joint reduction of the costs (Aubertot et al., 2005).

1.2. Profit versus Value

1.2.1. Social performances

1.2.1.1. *The issue of labor*
Labor productivity, measured against yields produced, is generally lower on organic farms than in conventional systems. Labor requirements are generally reported to be higher in Europe and in more intensive production systems (Jansen 2000; Green & Maynard, 2006, INSEE 2000).
The question of performances concerning work on farm is ambiguous: the “modernization” of agriculture aims “less work”, but on the other way, the fact that OF generates more work can also be considered as an asset in the sense that it creates rural employment.

A survey suggests that organic farmers find their farm work to be more satisfying than conventional farmers (Rickson et al., 1999). The quality of labor is considered more positive in organic farming because the work is more diversified and less repetitive (Jansen 2000). But Trewavas (2004) argues that the work on organic farms is harder and more back-breaking that work on a conventional farm, hence laboring on an organic farm is unlikely to be preferred to laboring on a conventional.

1.2.1.2 Organic marketing towards local?
Latacz-Lohmann and Foster (1997) have identified the contradiction between an ecological agriculture and mainstream agro-food commercialization as a structural incompatibility. Studies underline that organic

farmers are more involved in direct-marketing, which is more connected to community involvement than selling through brokers and export (MacKinnon 2006, Gigleux & Garcin, 2008).
As Morris (1996) mentioned, “small is the scale of efficient, dynamic, democratic, and environmentally benign societies.” In Canada, the sustainable food system’s approach is often labeled “community development.” This approach is compatible with communitarianism, as described by Frazer and Lacey (1993). But these types of projects have only limited potential as alternatives on a larger scale, and cannot be considered more authentic just because of their degree of exclusivity (Kjeldsen & Ingemann, 2009).

1.2.2. Compared profitability with conventional
A review about the economic performances emphasized about the difficulty of the comparisons, and the need to work on the domain of validity of comparisons (Nemes, 2009). The main criteria for economic comparison used by different authors are the following:
-Geographical proximity (Dobbs and Smolik, 1996; Canavari et al., 2007).
-Physical similarities, such as size, soil and farm type (Dobbs and Smolik, 1996; Wynen, 2001; Canavari et al., 2007);
- Managerial similarity, such as experience (Mendoza, 2002); and management skills, (e.g. Wynen, 2001).
- Cropping type similarity, such as mixed farms with livestock (FAT, 1993; Dobbs and Smolik, 1996).

Gross margins of organic enterprises are at least as good as, if not better than, those under conventional regimes. In more extensive systems like those practiced in North America, input cost reductions are often sufficient to maintain margins. In more intensive production systems such as those found in Europe, premiums are often required to offset yield declines (Stockdale et al. 2001). A compilation of various studies shows that ecological systems in general generate larger economic benefits than equivalent conventional systems (Reganold et al 2001, Nieberg & Offermann 2003). Figure 1 compares the economic returns for the two types of production, and shows the variability of the results, particularly high for vegetable and fruit crops, illustrating the potential difficulty to manage transition for the farmers cultivating those vegetables and orchards.

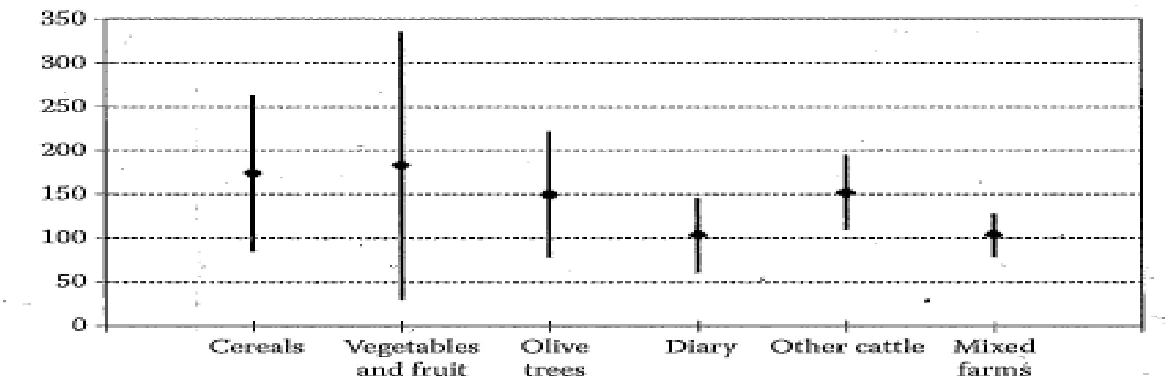

Fig 1. Economic return per ha for various ecological systems as a percentage of the economic returns for equivalent conventional systems (from Offermann and Nieberg, 2000, Alonso 2003, Alonzo and Guzmàn, 2004).

Overall studies have found that organic farms have lower input costs (e.g., Wynen 2006), with Offerman and Nieberg's (2000) review estimating that organic farms have approximately 20% lower input costs (driven primarily by lower fertiliser, chemical, energy and fixed costs). But the global costs can be higher especially due to higher labor costs.

Obviously the profitability is influenced by the following main determinants (Nemes, 2009):
- Agricultural policy and market environment: even with less yields and higher production costs, organic remained more profitable due to higher market price and premiums (IFAD, 2005; McBride & Greene, 2008). Data from Great Britain and Germany showed that higher prices for organic products accounted for 40-73 % of profits for arable farms, and 10-48 % for dairy farms (Offermann & Nieberg, 2000). But awareness should be raised on the fact that the relative importance of price may decline under more liberalized market conditions, as was shown by Sanders et al. (2008).
- Farmers' management abilities: although hardly measured in economic studies, farmers' experience and decision-making abilities are one of the most crucial determinants for profitability. Farm success is often more dependent on the management ability of farmers, especially in the area of marketing (Greer et al., 2008). Fowler (1999) noted that technical knowledge and management ability were obvious in the best performing farms.

To conclude, besides determining whether organic systems are environmentally better or not, studies focused on economic results to measure if OF&F could be economically attractive enough to trigger wide spread adoption. If OF&F offers a better environmental quality, and potentially healthier foods, but not sufficient economic returns, it would obviously remain available to a tiny fraction of farmers. OF has sometimes been criticized because of its yield penalty and increased costs (Trewavas, 2004) and numerous authors were interested in the economic performances of OF&F. Sometimes results between conventional and OF were contradictory (Cacek & Langner,1986). The difficulty of choosing comparable sampling pleads for counterfactual analysis of performances between conventional and OF farms using quasi-experimental designs (see Imbens & Wooldrige, 2009).
However, the continued growth of organically managed lands worldwide argues in favor of the viability of OF&F (Nemes, 2009). Still OF&F faces numerous challenges to consolidate these performances and its position of sustainable agri-food system prototype.

2. OF&F FACES CHALLENGES IN TERMS OF PERFORMANCES ISSUES

From a statutory point of view, OF&F is defined as best effort undertaking towards different performances, but a better control - even an obligation- of results is object of a greater demand. It remains to identify i) with which production characteristics this demand could be satisfied, ii) if the fact of privileging one criteria emphasize the objectives conflicts with other performances. Moreover what appears is that these reviewed performances remain debated, and that controversies still take place.

Besides the above mentioned controversies often related to the methodology of comparisons of OF&F with conventional farming, other discussed points, more intern to OF&F, are related to: i) the differences of OF definition (variable standards according to countries; variety of OF's interpretations and implementation, ii) the average results towards the variability of the concerned situations (systems, surfaces, pedoclimatic conditions) and the multiple involved factors in the performances (e.g. Carbonaro et al., 2002; Fauriel et al., 2009), iii) the absence of consideration of cumulative effects and the dynamics of transition, being able to be translated by a revision of the objectives of production and (iii) the absence of a redefining of the performances criteria, and also the need of their multidimensional form (Geniaux et al., 2005).

2.1 OF as a heterogeneous entity

A historical approach can help to identify the founding paradigms and their differences, mainly between Steiner's organic vision of a farm integrating breeding as a key component, and Howard's vision favoring soil fertility and humus management (Lamine & Bellon, 2009a). This leads to renouncing to the idea of a unique original paradigm for organic farming and contributes to the necessary acknowledgement of organics' internal diversity (Besson, 2007).

Besides, it must be underlined that the values are only partially codified in regulations. The organic standards tend to focus on allowed/disallowed inputs and on practices that are easy to codify and audit through the certification process. This mostly affects agro-ecological systems values such as biodiversity and nutrient recycling, as well as the lack of social considerations (Padel, 2007, Darnhofer 2010). This fact does not mean that the core values are not taken into account but that they are subject to interpretation and that their importance can vary to one stakeolder to another.

As shown in the previous section most publications implicitly consider OF&F as a relatively homogeneous entity. OF&F issues are often studied and discussed as a whole. But OF presents multiple combinations of performances criteria, exhibiting successful "trade-offs", beyond the classic distinction between "economic versus environmental performances", "ethical versus opportunists", "small versus big farms", "redesign versus incremental changes", "local versus globalized food chain". But certain non organic farms can have more beneficial effects from the point of view of the environment / quality than the intensives ones in OF (Kirchmann & Bengström, 2008).

However some studies emphasize on organic diversity. For instance the differentiation among farming situations can be identified through production systems and marketing channels (Desclaux et al., 2009), or related to three main approaches: no chemicals, agro-ecological, and integrity approach approaching the holistic biodynamic principles (Verhoog et al., 2003). OF's variety was also approached on regional studies (Morel & Guen, 2002; Van Displeasure et al., 2009) or focused on certain systems of production, in vegetable dominant (Gigleux & Garcin, 2005; David, 2009) or animal (Hovi & Garcia Trujillo, 2000; Roderick, 2004; Pavie & Lafeuille, 2010).

Many variables could be relevant to account for this diversity. However two comprehensive axes can be identified (Sylvander et al., 2006). The first axis opposes basic compliance with OF standards to system redesign. It is consistent with the ESR model: Efficiency, Substitution, Redesign (Hill, 1985). The second axis refers to governance patterns, whether individual or collective (Sylvander & Kristenssen, 2004). These two variables define 4 models or idéotypes. A fourth level can be added (Gliessman, 2010) to reconsider the link that can be built between food production and local consumption, hence opening towards agri-food systems.

The proposed framework requires different forms of knowledge from producers, advisers and certifying agents (Seppanen & Helenius, 2005, Sautereau 2009). All situations can be positioned in between these ideotypes (i) as combination of ideotypes (Girard et al., 2001), ii) as terms of passage from a model to the other one (Penvern et al., 2010), iii) or towards the principles and the values of OF as proposed by different authors (Guthman, 2000; Wit & Verhog, 2007; Rahmann et al., 2009; Darnhofer et al.,2010). In OF&F, inputs substitution is a basic requirement, since alternative production methods are advocated. Indeed it is also possible to search a higher efficiency of inputs in OF, without redesigning the system. The prevalence of inputs substitution and efficiency does not question monoculture or the dependency on external inputs, and limits the potential solutions to the socio-economic and ecological crisis of modern agriculture (Bellon et al., 2010).

One pending question is to know whether this multiplication of models can sustain or counteract OF development. At least it can be assumed that competing development models are at stake. Alternative models and practices remain to invent in OF. That is what is actually at stake in France with new dynamic in the organic networks, who study new organic standards in order to promote more coherent practices than the one allowed by the European Regulations -CE 834/2007- (the name of this label will be "Bio Coherence").

2.2 The need to upscale to optimize performances

A preferential localization of OF on certain territories (Risgaard et al., 2006; Riely, 2005, Eades & Brown, 2007, Geniaux et al. 2008), accompanied of policies of support would facilitate at the same time the OF environmental impacts, the agro-biodiversity (Di Falco et al., 2010) as well as the valuation of products by the identification of products belonging to "eco-regions" (Schermer, 2006).

The ecosystemic services connected to the presence of plots of land cultivated in OF are dependent of their localization and their insertion within a mosaic of natural environment and of conventional farms (Markus et al., 2007, Rundlöf et al., 2008, MacFayden et al., 2009). The global evaluations of the effect of OF on the landscape or territorial scale are rare or partial (e.g. Rundölf & Smith, 2006, for the pollination), in particular because of a lack of fine database fine on wide areas. At the same time, several works indicate the interest of OF for several ecosystemic services (Benett et al., 2007; Kareiva et al., 2007; Sandhu et al. 2008). Also the question of closing the cycle of the mineral elements needs an up-scaled approach. We make the hypothesis that technical and organizational solutions exist to create this renewed agriculture, to reach objectives of ecological services, but that they are not only on the scale of the systems of production where they are mainly studied today, but also in them interrelations which agro-ecosystems maintains between them and with the other spaces.

The change of scale concerns at the same time the production system and the ecological services. A strong stake but also a bolt is which scale it is necessary to reach. The change of scale also questions the supply of enough food if OF would be developed on large areas. As shown before OF presents lower yields (in the developed countries). Encouraging conclusions for OF (review by Badgley et al., 2006; modelling of scenarios of conversion by Halberg et al., 2006) are debated by others (Kirchman et al., 2008; Martini et al., 2005): insufficiency of organic fertilizers associated with a lower and variable yield in OF (25 in 50 %), not compensated with legumes and manure, would engenders a need of more area, and in consequence more deforestation.

2.3. The need to switch assessment criteria ?

There is a long-standing debate in the economic literature about the best indicators to use for measuring the viability of OF's systems (Wagstaff 1987). Traditional measures of unit costs per unit of output are contested as suitable indicators of OF's performances.

Four essential system properties of agro-ecosystems have been determined: productivity (level of output), stability (constancy or persistence of output over time), sustainability (resilience), and equitability (evenness of distribution among various groups) (Conway 1985).

The specificity of OF&F is questioned: the production system, inciting to rethink globally -including the food system in a broad sense-, should also be assessed, and not necessary in comparison with the performances of the general farming. Is it necessary to use the same indicators, assessment and decision-making methods, than the conventional ones? Or is it necessary to agree to be "confused" a while in new reference values according to other criteria and other optima? What about long terms assessment towards the short ones, far more used? Using data from farm-level studies, Lockeretz (1989) concluded that lower production levels in sustainable systems may reduce economic benefits for farming communities in the

short term. However, because a greater percentage of the value of production remains in the community, greater long-term financial benefits might result from sustainable (including organic) systems, particularly as production methods improve.
The performance criteria of conventional agriculture need to be questioned, because all the system has been built to maximize these criteria. If not, the transition cannot occur, or it will stay at steps of simple improvement in an unchanged reference frame. For instance could autonomy, mutualistic relationships, conscious caring, part of the resources dedicated to the reproduction *versus* production, and sense of place be part of the assessed values (Hill, 2003)?

2.4 Global costs and benefits: OF reflects internalization of historically externalized costs

The recently published study by Badgley et al. (2007) concludes that global food requirements can be met with organic food production. European governments have concluded that supporting the conversion to organic agriculture could significantly reduce some of their public farm program expenditures (Lampkin 2003). A full analysis of conventional vs. organic public expenditures is lacking, and this area is difficult to study. Although both conventional and organic systems generate externalized costs, a study indicates that those from conventional systems are higher (Pretty et al. 2005). Work by Pretty et al. (2005) in the United Kingdom, using a weekly market basket approach, suggests that the full environmental cost of an average British conventional shopping basket should be at least 12% higher. This estimate does not account for many difficult-to-quantify environmental costs, nor does it address diet-related externalities. If such accounting of real costs were applied, it would bring current organic prices more in line with “conventional” prices. However, current organic food prices can be problematic for some consumers and remain one of the limiting factors to its widespread.

Furthermore something that is quite never taken into account are the knowledge and learning from the OF for surrounding farms not necessarly in OF resulting in positive environmental externalities as a whole. It is a strong benefit for organic agriculture that is not quantified. It also supports results such as found by Lohr (2005) in her work on the spill-over effects of OF in the USA. Indeed, perhaps the most important benefit of the presence of OF is that it created a positive externality effect in making the conventional management more sustainable for the long term (Wheeler, 2010).

CONCLUSION

OF is more and more recognized as prototype candidate for an agriculture’s ecologization (Bellon et al., 2000). It is thus a relevant study case to enlighten the transitions towards a more ecological agriculture (Sangar & Abrol, 2004, Lamine & Bellon, 2009), which can refer to the notion of sustainability (Elzen & Wieczorek, 2005), even if OF is sometimes considered below other propositions as agroecology (Altieri & Nicholls, 2008).
For Princen (2002), agriculture is a “modern frontier economy” with two main problems: *shading* (the obscuring of costs) and *distancing* (the spatial separation of production and consumption). OF is considered as a prototypical answer: (i) as an ecologically-based agriculture, it tends to internalize societal costs of production, and (ii) with its bottom-up governance and initiatives to promote short food chains, it tends to move the producer closer to the consumer (Smith et al.,2008).
Although there is still room for improving its performances OF continues to provide alternative models (or better alternatives) for sustainable development. The large ambition to develop OF raises further questions such as the capacity of OF to “feed the world” in the case of conversion of large areas, and as the question of OF’s ”intensification” (Griffon, 2006; FAO, 2007) as well as several subjects such as social justice from

the production and consumption side, with a focus on fair access to healthy food (Goodman, 2000, Schmid, 2009, Lamine &Bellon, 2009).

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