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# Toward an evaluation framework of Organic Farming Impacts on Rural Development

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# List of acronyms

EC: European Commission.
EEA: European Environment Agency.
OF: Organic Farming.
RD: Rural Development.
IFOAM: International Federation of Organic Agriculture Movements.
CMEF:
EU RDR2:
SEO: Social economic orientation.
FMP: farm management practices.

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# Introduction

The work presented here focus on Impacts of Conversion to Organic Farming policy in the European Union. The topic of interest is analysed on the causal framework of the DSPIR model: Driving Forces, Pressures States Impacts Response. The aim of the study is to detail causal mechanisms in order to design the DPSIR of Conversion to Organic Farming. Conversion to Organic Farming impacts are analysed in the scope of objectives targeted by European Rural Development Policy.

Organic Farming (OF) is recognise to have globally positive impacts on environment by EU commission (COM 2004/415 final-annex). Accordingly, policy makers want to see an increase of area under OF in EU. Thereby, it appear important to understand what are the determining factors that leads farmers to Conversion to Organic Farming (COF) in order to design policy instruments to encourage conversion for environmental or other types of issues. Furthermore, OF development is not an end in itself, rather it is used as a mean to reach specifics objectives. But, if some of OF impacts are known, some of them are at the state of likely impacts. Consequently, there is a need of clarification of the mechanisms involved in each impact pathway, especially in the perspective of evaluation that requires the use of indicators. The DPSIR model, offer a conceptual approach to analyse the whole cycle of actions, from policy to impacts, and feed back on policy in the light of impacts. This model is use both as tool of reflexion support that help to determine a hierarchy in the questions, and finally to design a conceptual model of action.

The following report is organised in two parts: The fist one set up the background of the whole study. It starts with a brief history of Organic Farming development EU & France and introduce the questions of sustainability. Then it describes briefly how EU Commission is implementing Sustainable Development into its policies. Sustainability and organic farming will then naturally drive the speech on current European Rural Development Regulation that is the basis of the study concerning Organic Farming impacts on Rural Development. The second part of the report first analyse each step of the causal framework offered by the DPSIR model applied on the pathway from Conversion to Organic Farming to Organic Farming Impacts on Rural Development. Built up a first version of DPSIR Model of Organic Farming that synthesise the exploration work. And finally, it presents the preliminary development of an evaluation framework.

# Part I : Background

## I.1 Organic Farming in European Union & France - from recognition to promotion

### I.1.1 A brief history of Organic Farming in Europe

Organic Farming (OF) concept began to develop during the fist half of the 19th century, with R. Steiner who sets up the principle of "Biodynamics" in 1920 and with "Organic Agriculture" defined by the British Soil Association on the basis of Sir A. Howard writings. Those movements where quite labelled with some spiritual background, but in a half century, those aspects leave the place to the development of promising agronomic practices experienced by the pioneers of Organic Farming, witch in turns leads to an official recognition of OF. France was the first European Union (EU) state to legislate on OF with the "Loi d'Orientation Agricole de1980", followed in 1985 by the establishment of the "AB", French organic Quality Assurance Scheme (QAS). In 1991 a regulation a EU level is set up, the regulation CEE 2092/91. This regulation only concern crop production, it was amended in 1999 by regulation CEE 1804/99 on organic livestock production. EU Organic Faming regulation gathers the EU organic QAS, and defines OF trough its implication in terms of expected impacts and agricultural practices orientations. In this regulation, we can basically sort agricultural practices orientations into two category: some are mandatory and concerns mainly authorized inputs listed in Annex II, other are given as recommendations and concerns a set of practices and orientations. Recommendations are reflecting the IFOAM[1] definition of OF: *"Organic agriculture is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system".* While mandatory items of the regulation are limited to the exclusion of the use of synthetic inputs, such as synthetic fertilizers and pesticides, veterinary drugs.

On the basis of this regulation, and with the help of EU public supports, OF starts to develop significantly through the fifteen states EU since 1992. Almost each EU member situation regarding to OF development is original, given the diversity of factors that are engaged Lampkin (2003).

The European Commission is now planning to renew the EU regulation on Organic Farming particularly because harmonisation of the various states organic standard is needed, but also to take into account of the evolution of OF technologies by reducing the tolerance of non-organic inputs (Padel 2008).

### I.1.2 Organic Farming development in European Union

Although Organic Farming only represented around 4 % of the 15-EU utilised agricultural area in 2002 (EEA, 2005): organic farming is in fact one of the most dynamic agricultural sectors in the European Union. OF sector grew by about 25 to 30 % a year between 1993 and 2002 [1]. In the recent years, Area under organic farming globally grew through EU, but the situation varies a lot among Member States. In the case of France, no significant changes were observable between 2003 and 2005 (Ag. Bio 2006).

#### Direct payment support for conversion to OF

The Public policy instruments that accompanies this modest but rapid development of OF have to be analysed in order to understand their action, among other factors, that lead farmers to conversion. EU public support on Organic Farming Conversion (OFC) stats in 1993 on the basis of the

[1] International Federation of Organic Agriculture Movements. Worldwide organization uniting more than 750 member organizations in 108 countries. It was initiated in 1972 by European pioneers of Organic Farming.

1992 reform of the Common Agricultural Policy. OFC support is a part of the Agri-environment payments introduced in common agricultural policy since EC regulation 2079/92. This has been continued under Agenda 2000 rural development programme; EC regulation 127/1999, leading to the creation of the so-called 2nd pillar of the CAP intended to finance rural development measures that include agri-environment. Even more recently, EC Reg 1290/2005, clarified even more the two aspects of the CAP evolution with the institution of two more distinct founds: the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development.

Concretely, since 1993, Organic Farming Conversion financial measure at farmer level is possible in the frame of EU agri-environmental programs. This is then implemented differently by each member state in their owns National Program of Rural Development. This framework has been clarified along of the successive Rural Development programming periods: 1992/1999, 2000/2006 and the current 2007/2013 programs.

### Action Plans for OF development

In complement on measure at farmer level, European Commission (EC) started in 2002 a work to set up an European Action Plan for organic food and farming, it lead in June 2004 to the publication of an "European Action Plan for Organic Food and Farming" under the form of a “communication from the commission to the council and the European parliament” : COM(2004)415 {SEC(2004)739}. But, if the 21 actions listed are jugged relevant by the IFOAM there was no financial resources allocated by the Commission to this plan, nor time of quantitative objectives for the realisation of the proposed actions listed [2,3].

At national level, many member states have already implemented Action plans for OF development, Padel (2003) propose a review of theses plans.

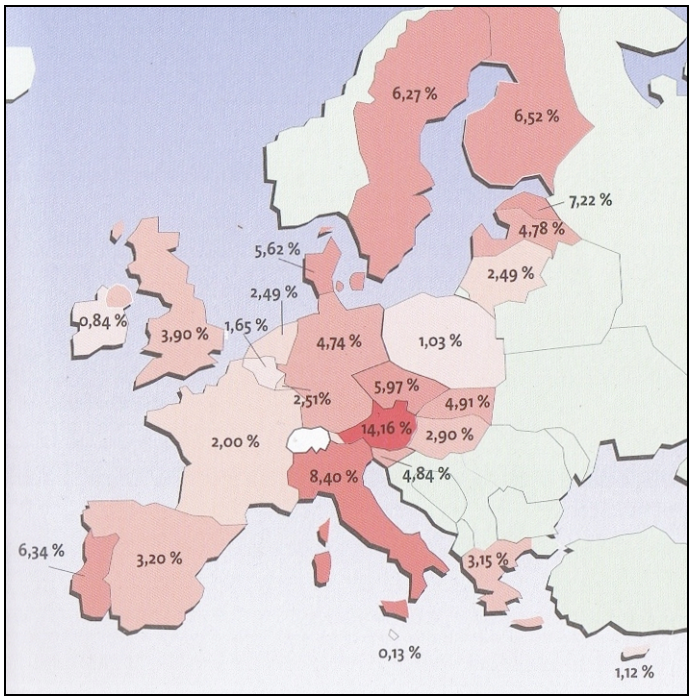


**Figure 1:** Share of agricultural area under Organic Farming in 15-EU in 2005 (Ag. Bio 2007)

#### *I.1.2.1 Why EU and member states are promoting OF ?*

Since, sustainable development must encompass food production alongside conservation of finite resources and protection of the natural environment so that the needs of people living today can be met without compromising the ability of future generations to meet their own needs. This objective requires farmers to consider the effect that their activities will have on the future of agriculture and how the systems they employ shape the environment. As a consequence, farmers, consumers and policy makers have shown a renewed interest in organic farming [1]. Within EU policies, interest on Organic Farming is mainly due to it’s impacts on environment. Down the Sixth Community Environment Action

Programme in 2002 (EC 2006/144) one of the actions proposed for achieving the objectives of the programme is "to encourage more environmentally responsible farming, including, where appropriate, extensive production methods, integrated farming practices, organic farming and agro-biodiversity."

In the staff-working document annexed to the European Action Plan for Organic Food and Farming Commission (COM 2004/415 final annex), the main benefits of organic farming are related to:

- Pesticides reduction use.
- Plant nutrients management.
- Soil protection.
- Biodiversity and nature protection.
- Animal welfare.

# I.2 Organic Farming and sustainability

EU wants to Promote OF for sustainable RD impacts, let's define this more in depth: After a brief recall of Sustainable Development concept, we will have a look on SD implementation in EU policies, and particularly into current Rural Development Regulation (RDR).

## I.2.1 Sustainable development: from a concept to it's implementation

### *I.2.1.1 Recall on Sustainable Development concept*

Sustainable Development became an official goal to all Nations since the Rio Earth Summit[2] in 1992. This Submit was a "historic moment for humanity" said Maurice Strong, the Conference Secretary-General. The most symbolic outcome is probably the third principle of Rio Declaration: ***"The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations"***. This concept was first introduce in Brundtland's report in 1987 during the World Commission on Environment and Development (WCED), in the following words *"a development which meets the needs of the present without compromising the ability of future generations to meet their own needs"*. This enlighten that Sustainable Development is an alternative approach to one simply based on economic growth. It implies the conciliation of economic progress, environment preservation and social equity, as illustrated in Figure 2.

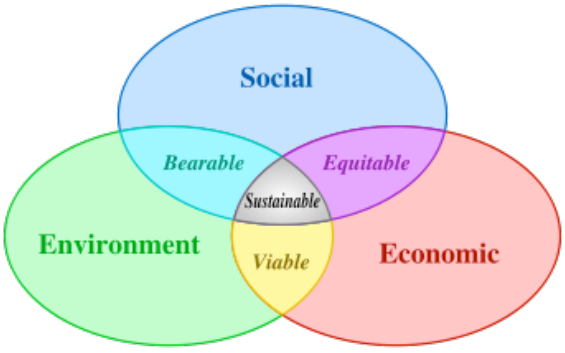


**Figure 2:** Scheme of sustainable development: at the confluence of three constituent parts.

The Rio Earth Summit results in the creation of entities, Commission on Sustainable Development; Inter-agency Committee on Sustainable Development, High-level Advisory Board on Sustainable Development. It also produces important documents are the : Agenda 21, the Rio Declaration on Environment and Development, the Statement of Forest Principles, the United Nations

[2] Also called the Rio de Janeiro, 1992, United Nations Conference on Environment and Development (UNCED).

Framework Convention on Climate Change and the United Nations Convention on Biological Diversity. At least the two last have some consequences on policies for OF, as we will see in a coming section.

#### *I.2.1.2 EU Sustainable Development Strategy*

The first step toward an EU sustainable development strategy occur in 2000, with the Lisbon European Council with the objective for 2010: "to become the most competitive and most dynamic knowledge-based economy in the world capable of sustained economic growth and providing more and better jobs and greater social cohesion". This strategy was then review in March 2005, leading to the so-called “new Lisbon strategy” and centred on more pragmatic objectives of growth, job creation and better governance. The most symbolic step happens in 2001, when the European Council in Göteborg endorsed the first European Union strategy for sustainable development (EU-SDS), by adding the environmental dimension to the social and economic ones from Lisbon process. However, unsustainable trends in relation to climate change and energy use, threats to public health, poverty and social exclusion, demographic pressure and ageing, management of natural resources, biodiversity loss, land use and transport still persist and new challenges where arising. For those reasons, the EU-SDS was renewed in June 2006. This current Strategy consists of seven key challenges, four key objectives and ten policy-guiding principles (APPENDIX 1) to move along a sustainable development path and maintain current levels of prosperity and welfare. It recognised that SDS goals can only be met in close partnership with the Member States and hence set in motion a new process of review and reporting involving the Commission and the Member States. The renewed SDS calls for an integrated approach to policymaking and a gradual change in our current unsustainable consumption and production patterns.

While Sustainable Development is covering all aspect of human activity, we will now focus on Rural Development aspect of sustainability, in order to define the framework of policies in which conversion to Organic Farming is include.

### I.2.2 Sustainability, Agricultural & EU Rural Development Policy

In the next subsection I.3, we will enter into details of evolution of Common Agricultural Policy and EU Rural Development Policy, but before this we enlighten here the tight links between sustainability, rural development and agriculture.

Rural regions account for 92% of the territory of the European Union (EU). Agriculture is one of the largest users of rural land, playing a multifunctional, innovative role as a key determinant for the quality of food products, the countryside and the environment with 19% of EU population living in predominantly rural regions and 37% in significantly rural regions. These regions generate 45% of the EU's value added and provide 53% of employment. Although the situation varies widely, in general income per inhabitant in these regions is around a third less than the European average, activity rates for women are low, and the service sector is less developed. Rural areas therefore face particular challenges as regards growth, jobs and sustainability in the coming years [3]. As a consequence, European Rural Development strategy is a very important issue in terms of Sustainability. For theses reasons, rural development and agricultural policy have progressively been integrated together leading since 1997 to the concept of “European model of agriculture”

Important steps of the integration of sustainability in Common Agricultural Policy, the 1992 reform, Agenda 2000 and RD regulation for 2000-2006, followed by CAP reform of 2003, and more recently the creation of a specific fund for support to rural development: the EAFRD (EC Reg. 1698/2005) witch is reserved to the “second pillar of the CAP” that is dedicated to take more and more financial importance in the future of CAP evolution thought modulation.

In 2001, with the fist EU-SDS, one of the actions identified was that the common agricultural policy should reward quality rather than quantity, particularly by encouraging the organic sector and other environmental-friendly farming methods. (COM 2004/415 final annex).

## I.3 European Rural Development policy – 2007/2013

The Rural Development Regulation (RDR) for 2007 to 2013 adopted in 2006 (EC 2006/144) reflects the implementation of sustainable development goals in European policies. First of all, it includes the tree constituent parts of sustainability, with key policy objectives that have been defined by the European Councils of Lisbon Göteborg. New RDR focuses on three areas corresponding to the three thematic axes: improving competitiveness for farming and forestry; environment and countryside; improving quality of life and diversification of the rural economy. A fourth axis called "Leader axis" introduces possibilities for locally based bottom-up approaches to rural development.

This regulation provides clear detailed rules on the management of programmes of the so-called “second pillar of the CAP” financed by the new European Agricultural Fund for Rural Development. On the basis of this regulation, member states had to submit to the European Commission their national strategy plans and rural development. Particular attention has been deployed for the evaluation of this new program. Indeed, for sustainable development implementation, evaluations have particularly high relevance as complex issues have to be dealt with generally over an extended period of time. The processes of evaluation is a cornerstone of SD implementation since it introduce cycles of evaluation/improvement of the policies, and the difficult task of setting up an evaluation framework imply an important work of characterisation of causal mechanisms from policies to the impacts, leading to a better understanding of the mechanisms involved in Rural Development.

In terms of objectives, the community's priorities for the rural development programming period 2007 to 2013 (EC Reg. 2006/144) had to be incorporated into the Member States' national strategy plans and rural development programmes.

**Community priority 1:** Improving the competitiveness of the agricultural and forestry sectors
**Community priority 2:** Improving the environment and countryside
**Community priority 3:** Improving the quality of life in rural areas and encouraging diversification of the rural economy
**Community priority 4:** Building local capacity for employment and diversification
**Community priority 5:** Ensuring consistency in programming
**Community priority 6:** Complementarity between Community instruments: To ensure synergy between structural, employment and rural development policies

To reach theses objectives, the RDR2 is organised into four axes:
**Axis 1:** Improving the competitiveness of the agricultural and forestry sector
**Axis 2:** Improving the environment and the countryside
**Axis 3:** Improving the quality of life in rural areas and diversification of the rural economy
**Axis 4:** called “leader” aim to encourage participatory processes and initiatives at local level for the achievement of the tree firsts axes.

Each national program include tree phase in their evaluation. The first one called “*ex-ante*” evaluation has to be preformed before the implementation of the program, and it is included in the national program document. Then an evaluation is preformed at “*mid-term*” of the programming period, and finally “*ex-post*” evaluation is undertaken near after the programming period end. A Common Monitoring and Evaluation Framework has been published by the Directorate General for Agriculture and Rural Development in 2006. This framework is composed of five levels of policy implementation and impacts indicators:
**1. Input indicators.** Example: expenditure per measure declared to the Commission.
**2.Output indicators.** Example: number of training sessions organised, number of farms receiving investment support, total volume of investment.
**3. Result indicators.** “Direct and immediate effects of the intervention”. Example: gross number of jobs created, successful training outcomes
**4. Impact indicators.** “Benefits of the programme beyond the immediate effects on its direct”. Example: increase in employment in rural areas.
**5. Baseline indicators.** Are composed of “Objective related baseline indicators » & « Context related baseline indicators » that enable and overall analysis of the program strategy, by a SWOT analysis to enlighten the program’s: Strengths, Weaknesses, Opportunities and Threats.

For our concerns, regarding to evaluation of OF impacts on Rural development, the model of third and fourth levels of this evaluation framework are of direct interest. Nevertheless, the indicators proposed are too synthetic to help the building of a comprehensive model of the mechanisms involved by Organic Farming. For this reasons, we are interesting in an analytical tool able to illustrate the causal relationships from policies and other factors to the impacts.

#### *I.3.1.1 DPSIR of agriculture*

The DPSIR concept is an analytical framework that has been developed at the European Environment Agency (EEA, 1999) in order to describe and understand the inter-linkages between economic activities and the environment. It builds on previous OECD work that divided indicators into PSR: Pressure Sate Response domains.

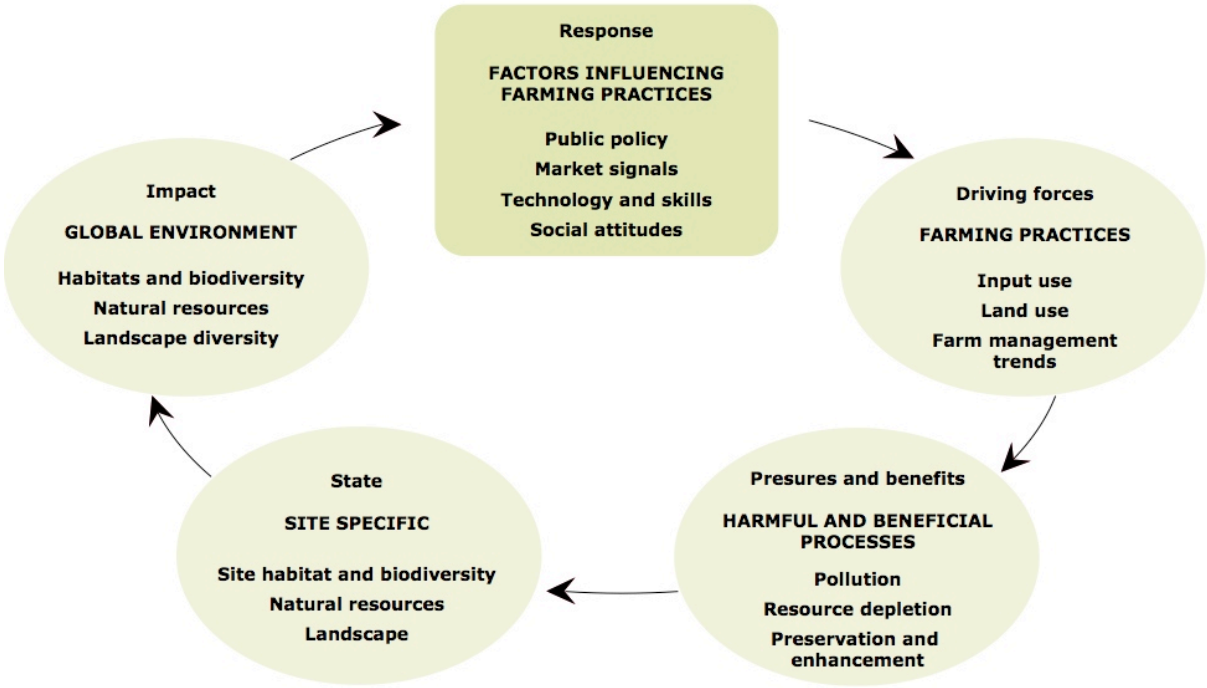


**Figure 3:** DPSIR framework for agriculture (EEA 2005, based on EC COM 2001/144 ).

# Part II : Toward an evaluation framework of Organic Farming

## II.1 Applying DPSIR model to Organic Farming

On the basis of the DPSIR of agriculture presented by Fig 2, we identified tree mains types of causal relations that we have chosen to organise this section. Fist, from the item response to the item driving forces, we should analyse what are the determining factors of Conversion to Organic Farming. Secondly, from driving forces to the impacts, the question is to identify the mechanisms involved in OF in the scope of their impacts. An thirdly, in the light of the two first components, how to integrate the results of the analysis in a perspective of action on the response item, that is to say on the factors that act on OF adoption and modalities of implementation.

### II.1.1 Review on determining factors for conversion to OF

A lot of studies focus on understanding factors that motivate farmers to adopt Organic Farming. In the line of Padel (2001), many of the studies used the innovation adoption/diffusion model, considering Organic Farming as a technology innovation. Adoption refers to an individual producer's decision, while diffusion refers to aggregate adoption behaviour. This general model is interesting because it introduce the prediction of some changes in the factors of adoption within the time, because "innovation" refers to the very early stages of a technology development. For instance, some factors may be of different importance in early stages than in late adoption, where farmer may simply imitate their neighbours; witch is linked the diffusion phenomenon. As a consequence, the model of adoption/diffusion of innovations in agriculture predicts an evolution in the personal and sociologic characteristics of the adopters. If this model has some advantages to analyse determining factors for OFC, it doesn't reflects all the factors mentioned in the literature, particularly, the economic, structural and institutional environment of farming. These factors could be classified as external factors, beside of the personal, sociologic and farm-specific characteristics that suit the adoption/diffusion model. Fig X presents a set of factors that are manly resumed by Padel (2001 & 2008), and that we crossed with factors mains types inspired by Marshall (2003) and EC COM 2001/144.

Studies are generally oriented on adoption factors, or analysis the diffusion of OF. In terms of methods, two main approaches are used; in one hand, qualitative sociological analyses are generally based on in-depth analysis of one-to-one interviews, and more recently with the focus group method. In the other hand, qualitative econometric methods generally based on probit or logit models are used to analyse correlation between one or more factors and the adoption of OF. Econometric analyses are undertaken with large data samples obtained from targeted surveys or institutional databases. The studies exposed above, are based on analyses of Organic Framers on Farmers in Conversion, all of then already took their decision. A complementary approach, less used, concerns analysis of conventional farmers attitude toward considering conversion to organic farming. That kind of approach is quite interesting for ex-ante evaluation of Action Plan on Organic Farming that generally include quantified targets in conversion rates. Koesling (2008) undertook such an approach in Norway, showing that only 4% of conventional farmers had plans to convert by 2009, in contrasts of the Norwegian official goal of 10%. That kind of study reveals the Policy challenge to persuade conventional farmers.

After this overview of approaches to analyse adoption and diffusion of OFC, we now attempt to synthesise the most relevant factors.

#### Innovation adoption / diffusion model

In many ways OFC fits the innovation adoption/diffusion model, indeed, Farmer who converts to OF are more educated, younger, involved in social network and exhibit particularly active information seeking habits compare to the mean of farmers. Padel (2001). Nevertheless, OF is in many ways not a typical innovation. While the innovation adoption/diffusion model usually refer to "simple" practice, conversion to OF imply a whole set of practices that usually require a complete

farming system redesign. As a consequence, and because of the complexity of making an integrated farming system in various agro-climatic condition, OF is still today a developing technology. Moreover, personal characteristics such as attitude toward environment or rural development issues are key factors for at least early OF converters that are not cited in the classical innovation adoption/diffusion model. Such differences also concerns Farm size, for witch studies revel an opposition, with bigger farm for typical innovation model and smaller for OF case, at least before around 2000.

### Public support

As we sow in part I.1.2, public support on conversion and development of OF, takes two mains approaches. The first is based on direct payments to farmers for conversion and/or maintain of OF, the second is implemented trough Actions Plans aimed at develop mainly organic market organisation, and OF knowledge.

Lampkin (2003) underline the importance of direct payment influence for the development of OF within EU. But other authors' emphasis the importance of, market services and information sources development as determining factors beside direct payments. Consequently, Genuis et al (2006) intended to analyse farmer's decision to acquire information from various sources, in order to deepen this question compare to the innovation adoption concept that simply consider information seeking at first degree. Accordingly to this concept, relation between OF and the acquisition of information where verified, and in addition, it a positive correlation with different information sources was shown. This conclusion, reveal that different sources of information are influencing farmer's attitude toward getting information. As consequence, it is expected that improving diversity of information channels for farmer's education, environmental awareness, and farm output diversification is a key action for a strategy of OF development. A great importance is given, in the various forms that could take information actions, like networks, advanced extension services, workshops, and round table meeting with various stakeholders. On this subject, it appear that participatory research may be very efficient tool for OF, both in terms of innovation for development of OF and a widespread of practices and knowledge both on farmers and rural population.

### Market signals

Two market effects are of great importance in stimulating OF development. First organic products are benefiting from premium prices, and secondly, EU organic market exhibits a constant and very important growth (Specialised Organic Retail Report Europe 2008).

### Territorial characteristics

Although Agro-climatic characteristics that are often cited as a factor influencing OF adoption, this has not been widely studied. Padel 2006, simply reported that farmers with difficult conditions such as natural handicap like mountains are judging easy to convert to OF since their previous farming system was not too intensive because of natural limitations.

Figure 4 is presenting an overview of the determining factors for conversion to OF cited in the literature.

### OF Conventionalisation debate

Coming soon.

| Factors influencing COF | Personal | Farm-specific | External |
|---|---|---|---|
| **Socials** | **Characteristics:**<br>- Background<br>- Age<br>- Social network<br>- Sex<br>- Goals, objectives, values<br>- Lifestyle and hearth<br>**Attitude toward:**<br>- The environment<br>- Food quality<br>- Rural development<br>- Inputs and technology<br>- Business<br>- Challenge and change<br>- | | - Acceptability in the farming community<br>- Local organic network<br>- Social demand |
| **Financials** | - Income level | - Farm type and enterprises<br>- Farm size<br>- Commercial orientation<br>- Capital resources<br>- Risks<br>- Existing financial problems | **Policy & public support:**<br>- Support payments<br>- Loans<br>**Market:**<br>- Inputs and outputs prices<br>- Outlets<br>- Premiums prices for OF products |
| **Skills** | - Education<br>- Information acquisition (active or passive)<br>**On OF:**<br>- Technical<br>- Profitability<br>- Market development | - Labour resources<br>- Farm productions<br>- Yield potential and variability<br>- Intensity of production | **Policy & public support:**<br>- Research<br>- Availability of information<br>- Advisory support |
| **Agro-climatic** | - | | - Local area pedoclimatic potential |

**Figure 4:** factors that are manly proposed by Padel (2008), that we crossed with factors mains types inspired by Marshall (2003) and EC (COM 2001-144).

Depending on countries, and regional state in the adoption/diffusion of OF farming, It is often emphasis, that public support to conversion, since the early 90's has been a major factor of adoption of OF (Lampkin, 2003). Furthermore, the growth of consumers demand for organic product, combined to the stagnation of conventional agricultural products price had possibly makes OF a solution to maintain farmer income, when increase of farm scale production where not possible (Darnhofer, 2005). Those arguments, are giving a priority to financial factors on COF, resulting, at least for a part of recently converted organic Farmers an approach more "business-oriented" than "sustainable-oriented" OF. Furthermore, a "conventionalisation" process of Organic Farming is describe since the 90's, with the increasing involvement of the agri-business for organic products, that could drive the development of organic farming, on the same way than it has driven convectional farming in the past, i.e. intensification, industrialised fashion, and less commitment to organic values and principles. If the professionalization of OF may only be a sign of it's diffusion and development, there are lots of concerns whether this tendency, result automatically in lowering of the sustainability goals of OF to the benefit of market and financials goals. To enlighten this question, at least at the level of farmer's intentions, Padel 2008 analyses the differences of conversions factors importance between early, late and potential OF adopter. Her results, shows globally that even if there are some differences, the attitude toward environment is of more importance than financials goals even for recent or potential OF adopter. Furthermore, she observed in England, like Koesling (2008) in Norway, that the rate of potential converter is less than the half of the state objectives on COF for the next years. As conclusion of the two finding exposed above, Padel (2008 indicate) that Public support on COF should not rely only on direct payments, but need also to consider non-economic and technical factors in policy making with the glance of the targeted increase in Aera under organic farming.

Anyway, Padel 2008 argue that if some of the organic farmers “are mainly motivated by short term gains and induces by direct payments”, they “may consider a revision as soon as economic conditions become less favourable and they are allowed to opt out of the scheme”. Such cases could be seen in a very close future since agricultural products prices shows an important increase since about 2007, leading to lower or even no price difference for some products, whether they are conventional or organic. In contrast, price raises of fossil fuel and agricultural inputs whose production costs are highly linked to fossil fuel, like chemical nitrogen fertilizers, may lead to a greater competiveness of OF.

As conclusion of this section, conversion to organic farming may be considered as a dynamical process in time, with an evolution of the importance of the various factors along the development and diffusion of Organic Farming. It seems that in many cases, COF is still relying on innovation adoption factors, combined with environmental awareness. Furthermore, if direct payment on COF have greatly contribute to the development of OF thought Europe, more attention of the policy-makers should be directed on OF Information, concerning it’s original concept and for knowledge production and skills diffusion. Finally, territories agro-climatic characteristics are often cited as factors of conversion, but it seems that it has not been deeply investigated. Padel 2001 just report that O Farmers in mountains area are jugging quite easy their conversion, since their previous farming system where neither too specialised nor too intensive.

### II.1.2 Impact Factors of OF on Rural development

We sow in part XX that current political point of view (COM(2004)415 final-annex) on OF expected impact are almost only concerning environmental aspects. However, since the 90’s literature also relate promising convergence between OF and Sustainable rural development, in particular regarding economical and social impact. Pugliese (2001) reports that if such a convergence has been progressively acknowledged, of the relationship between the two have not been studied extensively. After a review recalling key elements of sustainable rural development and the most complete definition of organic farming, Pugliese (2001) identified four common aspects that are “interlinked broad concepts, namely *innovation*, *conservation*, *participation* and *integration*” at the intersection of OF and SRD. Theses four aspects represent a framework for analysing more deeply the role that could play OF for a sustainable rural development. The end of this paragraph, illustrative rather than exhaustive, is reporting very briefly some examples of OF implications on RD as describe by Pugliese (2001). O Farmers are often exhibiting characteristics of *innovators*; they have an important role in animating rural areas, as a positive force of change and revitalisation, by setting up various activities responding to current rural challenges and social demand. Example cited is concerning alternative channels of direct sales that manly develop among organic farmers, leading to new relationship between consumers and producers, and also between rural and urban populations. Of course this capacity of innovation may have positive consequences on economic growth, job creation, quality of life in rural areas, etc. *Conservation* concept should not be seen as a “sanctuarysation”, or as an opposition of innovation, but rather as way to preserve, traditional landscape, local culture by the mean of it’s economic valorisation trough the use of practices that are both effective in terms of conservation and in generating income. The role of OF in that kind of problematic, is currently being demonstrate in several national and regional’s parks throughout EU. *Participation* of people to the development process of their living area is a key factor of the social aspect of sustainable development, in this scope OF shows some interesting features like a strong networking activities among farmers, and more generally with local population on various aspects such as commercial relations, information and technical support, en even socio-cultural initiatives. *Integration* process refers to the concepts of multidisciplinary and multi-sectorial approach applied to the development strategy of a territory. This may be the most global concept in sustainable development. In an innovative and participative rural scheme, integration can mainly be achieving trough diversification of rural activities. In this context, OF provides interesting opportunities of integration with the territory and with other sectors of the economy, based on, on-farm and off-farm activities that can be integrated, like agri-tourism, agri-business, agri-craftsmanship or agri-industrial sector.

After this paragraph that mainly aimed at introducing the less known impacts of OF on rural development, apart of environmental one’s like. Our intention here is to initiate a work of conceptualisation of the pathways from OF characteristics to the various Impacts on RD that OF could provide, in order to identify the factors that are acting in the modulation of resulting impacts.

### *II.1.2.1 Deepening the concepts involved in the question*

In order to progress in the question of analysing impact factors of organic farming on rural development, we need to define the concept involved in the question. The definitions we use here are not exhaustive, but should rather be considered as working definition in the scope of the work presented here. We are defining here step by step, the basis taken to consider: Impacts on rural development, the impact factors and Organic Farming.

#### Impacts on Rural Development:

The impacts considered in this study are related to the objectives of the current EU regulation. As we sow in part xxx this regulation is objective orientated. In order to use a conceptual approach of the objective of this regulation, we are using the seven goals related to impact indicators in com xxx to have a clear basis of the targeted impacts of rural development, theses goals are presented in figure Figure 5.

| |
|---|
| Economic growth |
| Employment creation |
| Labour productivity |
| Reversing Biodiversity decline |
| Maintenance of high nature value farming and forestry areas |
| Improvement in water quality |
| Contribution to combating climate change |

**Figure 5 :** Common Impact Indicators topics as defined in CMEF for EU RDR2

#### Impact factors

This is defining the aim of the question. The purpose here is not to directly to analyse the impacts, but rather to analyse the factors that are involved in the modulation of occurrence and the level of impacts.

#### Organic Farming

This is the central topic of the question, and the origin of the methodological difficulty. Actually, we have to consider here Organic Farming as a farming system under a quality scheme regulation that is unique, but that can lead to a variety of different farming models. In order to analyse impact factors of OF on rural development, we need to enter more in depth into the characteristics of such farming models. So the difficulty we face, is to set up an analytical framework that need to be relatively simple, but anyway representative of the diversity we met when considering the reality of organic farming. A first approach of conceptualisation was undertaken by Sylvander et al (2006). These authors are proposed a comprehensive description of OF models bases on two main axes that are defining four models as presented in figure 6. The horizontal axis characterise management and governance. The two polar types or this first axis, are defined as "*corporate or individual governance"* when farmer have a central role, and autonomy his production and diversification activities, against "*sectorial or territorial governance"* when farmer is involved in collective organisation of generally specialised food chain at regional or national level. The vertical axis characterise the "*degree of achievement of socio-technical concepts of OF&F's.* It ranges from "*basic compliance with OF&F standards"* to "*system redesign".*

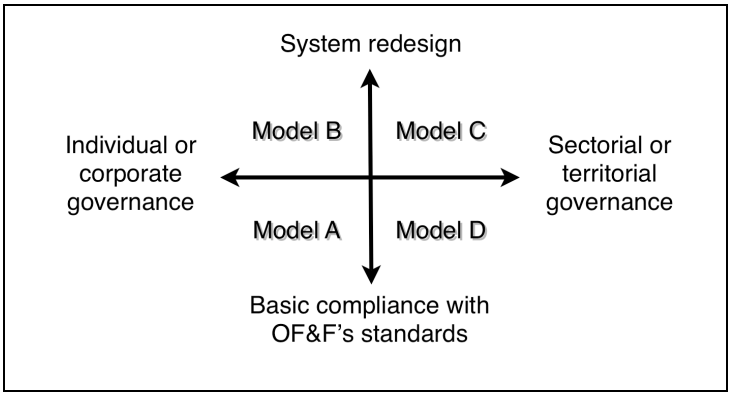


**Figure 6:** Accounting for the OF&F's diversity (Sylvander at al, 2006)

The four models given away from this scheme are:

A: usually profit oriented organic or partially organic farms, with farm management practices limited to input substitution

B: Exclusive organic farms, skilled farmers, with diversified activities and/or having non-contractual relationship with small firms and supermarkets

C: Same as B with contractual agreements with firms and supermarkets

D: Same as A, vertically integrated, selling to wholesaler, large processors and/or supermarkets.

This conceptual scheme helps to circumscribe the range of situations that include the diversity of OF systems that are currently developed by farmers. From this work, we are retaining the two main characteristics that will help us to define OF diversity, we will use the terms of "farm management practices", and "socio-economic orientation" corresponding to the factors integrated in the model descibe by Sylvander et al (2002). After this first level of conceptualisation, we need to identify (i) the farming practices and (ii) the socio-economic orientations that are the driving forces of pressures and benefits from OF. Anyway, concerning socio-economic orientations, we won't use exactly the scheme as proposed by Sylvander and al (2002), indeed theses authors are only considering the farm / farmer diversification in the scope of the food chain, and we sow at the beginning of section II.1.2 of this report that diversification process could be applied to other economic sectors. Furthermore, a recent study by Darnhofer 2005, reveal that organic farmers in an Austrian area with a (EU relative) high rate of OF, is giving interesting insights. In the studied area, farmers are generally vertically integrated in the main agro-food chain, nevertheless they usually exhibits other kind of diversification, or integrated para-agricultural activities at local scale, this emphasis the role of O Farming on rural development, even in the case of vertically integration in the main Agrofood-chain. Darnhofer (2005) provides an interesting way for conceptualisation on different diversification processes, with tree types of approaches; *deepening* or *broadening activities* and *regrounding*. We decided here to integrate Darnhofer results in our reflexion, but it should be noticed that most of Austrian farms are familial, and small scale.

From the analysis of the concepts involved in the question of impact factors of organic farming on rural development we propose a framework of main factors that characterise the diversity of OF models. A chart of this framework is presented Figure 7. For the two global factor that are Social economic orientation (SEO) and farm management practices (FMP), extreme models are include in a causal pathway with *a-priori* impacts on rural development.

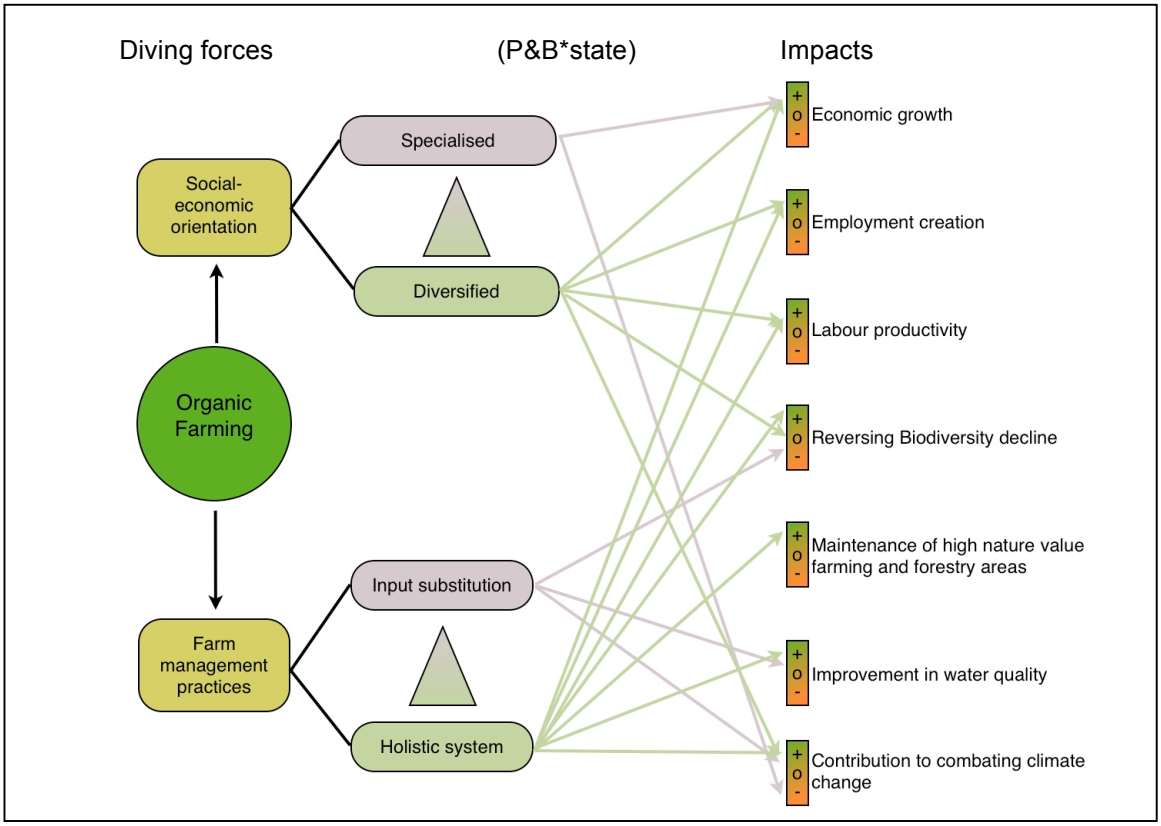


**Figure 7:** Proposed framework of main factors that characterise the diversity of OF models include in a causal pathway with *a-priori* impacts on rural development.

Other Impacts depending on OF model are more likely to occur within OFarms, since it is recommended in OF regulation + technical / market constraint of OF system may lead to the adoption of good practices.

The adoption of farm management practices / socio eco orientation that are “Recommended OF practices” expressing the more complete approach of organic farming may be determine by factors types very close to OF adoption. EG / social attitude / Information / financial.

Many of then could benefits from public support in the frame of Agro-environment measures

### *II.1.2.2 Methodology – conceptualisation of the driving forces of OF*

Since organic farming is a broad-spectrum measure, it concerns all of the various productions of the agricultural sector. Each type of production have it’s own set of practices and social-economic orientation that are leading to various benefits and pressures. Consequently, a farm type typology is necessary at first level of analysis of OF within a given territory. Form example in an almost exclusive livestock production area, OF won’t have the same impacts than in a mainly arable crop area. Such kind of farms typology has been proposed. As an illustration, annex X presents the typology used in Seamless[3] model. Before the production patterns, this typology include information on farm scale and production intensity. We assume here that such a typology could be used as first level of conceptualisation of OFarming systems. Following this step, it is necessary to conceptualise more deeply, the driving forces resulting of social-economic orientation (SEO), and farm & field management practices (FMP). If SEO model is likely to suit all farms types, FMP are linked to specific, or at least specific group of farms types. Figure 8 gives an illustration on how the proposed framework can be use to analyse OF driving forces. In order to reach a more simple but reliable image of OF driving forces, it may be necessary to explore all of the farm types specificity, in order to identified the most important driving forces.

[3] System for environmental and agricultural modelling linking European science and society.

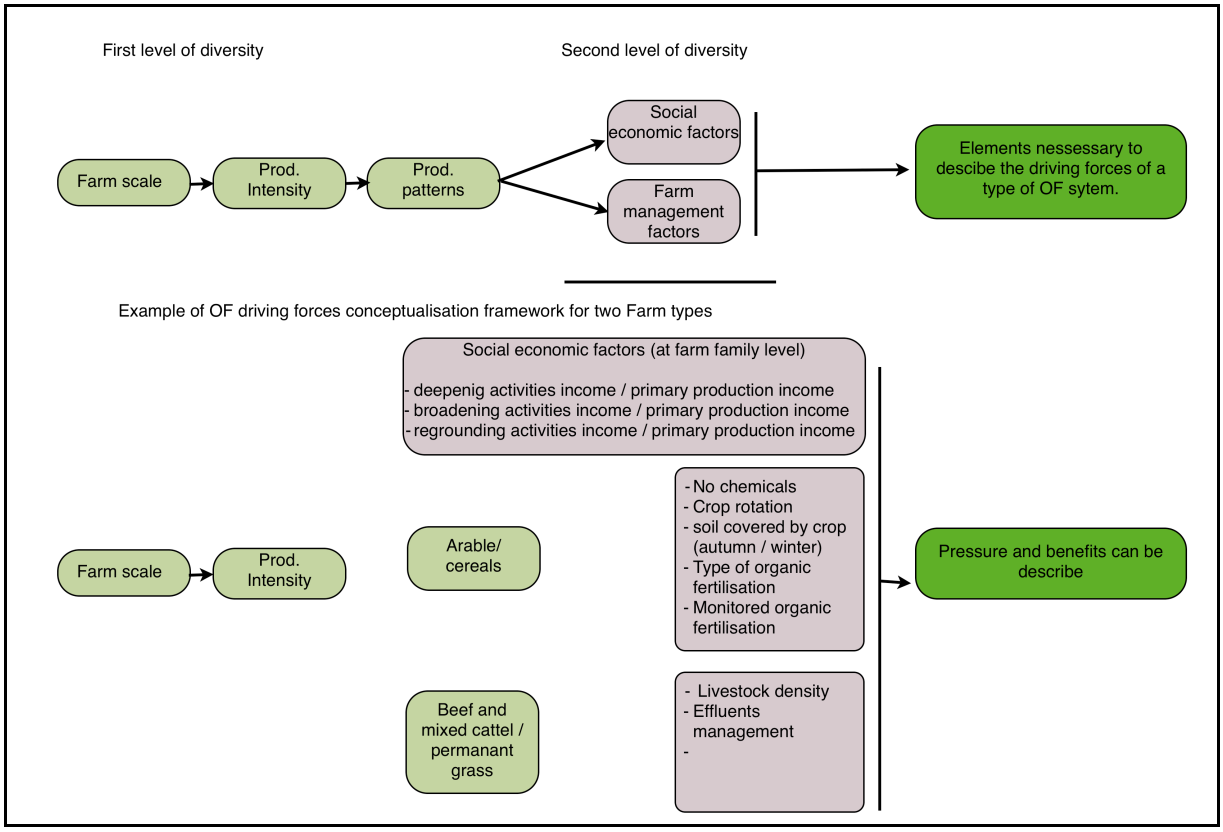


**Figure 8:** Conceptualisation of OF driving forces diversity. Farm type, management practices and Social-economic orientations.

### *II.1.2.3 Design of an Action Model from driving forces to pressures and benefits*

The action model framework presented here is inspirited by the schemes used by AND international in the post ex evaluation of the French rural program for the period 2000/2006 to illustrate the effects of MAE on the objectives of this program. In the scope of our work, this model intent to visualise the details of mechanisms involved in the path from SEO and FMP to their consequent pressures and benefits. Once again, the scheme presented here is only indicative, as the purpose here is just to prepare a methodology. Starting points are defined by SEO&FMP then the causal pathway to their pressures and benefits are successively approached by, indirect and directs effect, systemic effects, and finally synthetic effects. In front of the complexity of the mechanisms involved, and the diversity of the pressures and benefits targets to consider in the scope of impacts on rural development, only a few pathways are presented here. Very far from being exhaustive, fig X present the proposed approach for an action model design. In this example we decides to illustrate the existence of combined effects.

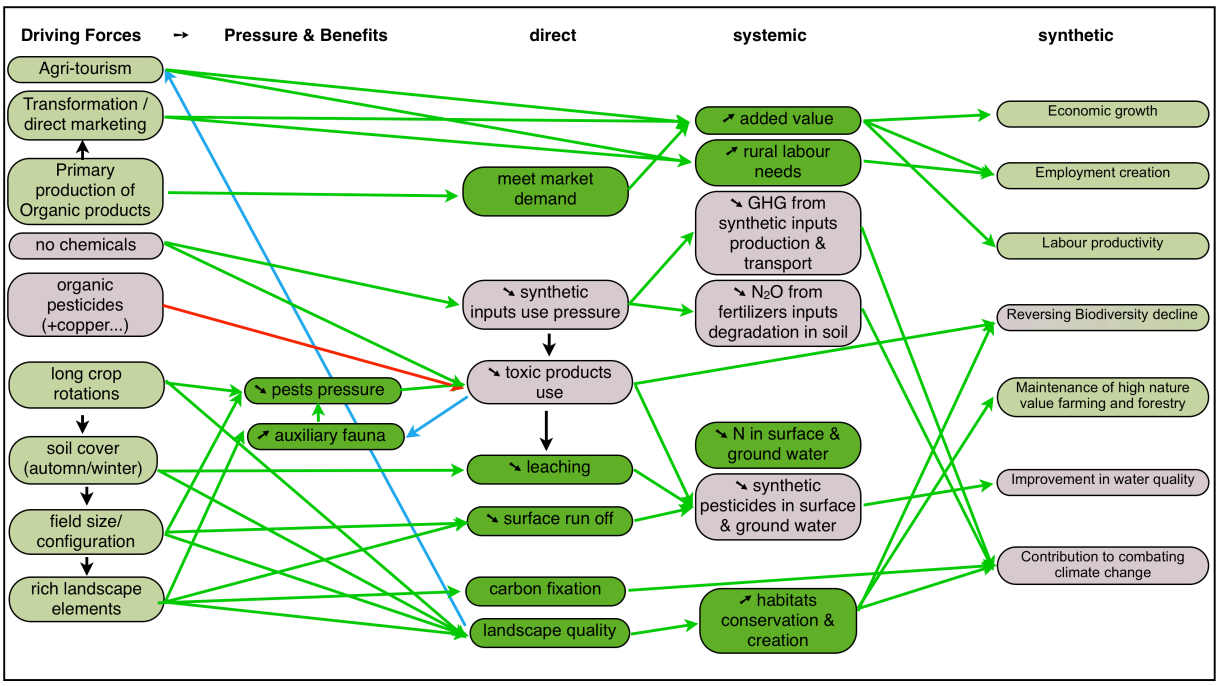


**Figure 9:** Example of action model for causal relation description from driving forces to pressure and benefits.

### *II.1.2.4 Questions of scales, initial state, and territories specificities*

Even more than for other agro-environmental measure OF impacts would depend on a lot of territorial factors. Putting into practice the previous sections at a territory scale will lead to a territorial image composed by a pattern of farms types and a set of FMP and SOE representative of the area. This image may no be so complex because each territory have it's own specificity, in term of socio-economic and agro-climatic potentialities. So that, the practices and orientations may only exhibits a few models. Pressures and benefits generated by farming models encountered at a reasonable scale may be therefore quite easy to analyse. Then, at this stage of the causal cascade, the importance of the effects of pressure and benefits on the global impacts at territory scale is depending on some initial conditions. We propose here, an extreme example to illustrate the importance of territory initial conditions; if we look at a territory where grassland/livestock production is representing 99% of the area, the main benefits of organic farming, eg. regarding synthetic pesticides residues in water, won't lead to a great impact, since pesticides residues in water may not be an issue in such a territory. In opposite, the same benefit of OF on water pesticides residues in a territory of arable crops, with water contamination issues, OF could a have a very important impact. But there is still some necessary condition from the benefits at Organic Farm scale, to the territorial impact. First, the question of the proportion, or concentration of OF within the considered territory is of major influence. And secondly, a scale of time has to be taken into account. If the issue of pesticides residue is concerning ground water, an impact on this resource may occur only slowly. And it could be necessary to have a very high ratio of farms under OF in the area during a time period of 10 to 30 years.

## II.2 Built-up the DPSIR Of Organic Farming

From the main characteristics of each item of the DPSIR framework, explored in the previous sections, we draw a first draft of the DPSIR model applied to OF, presented by Figure 10.

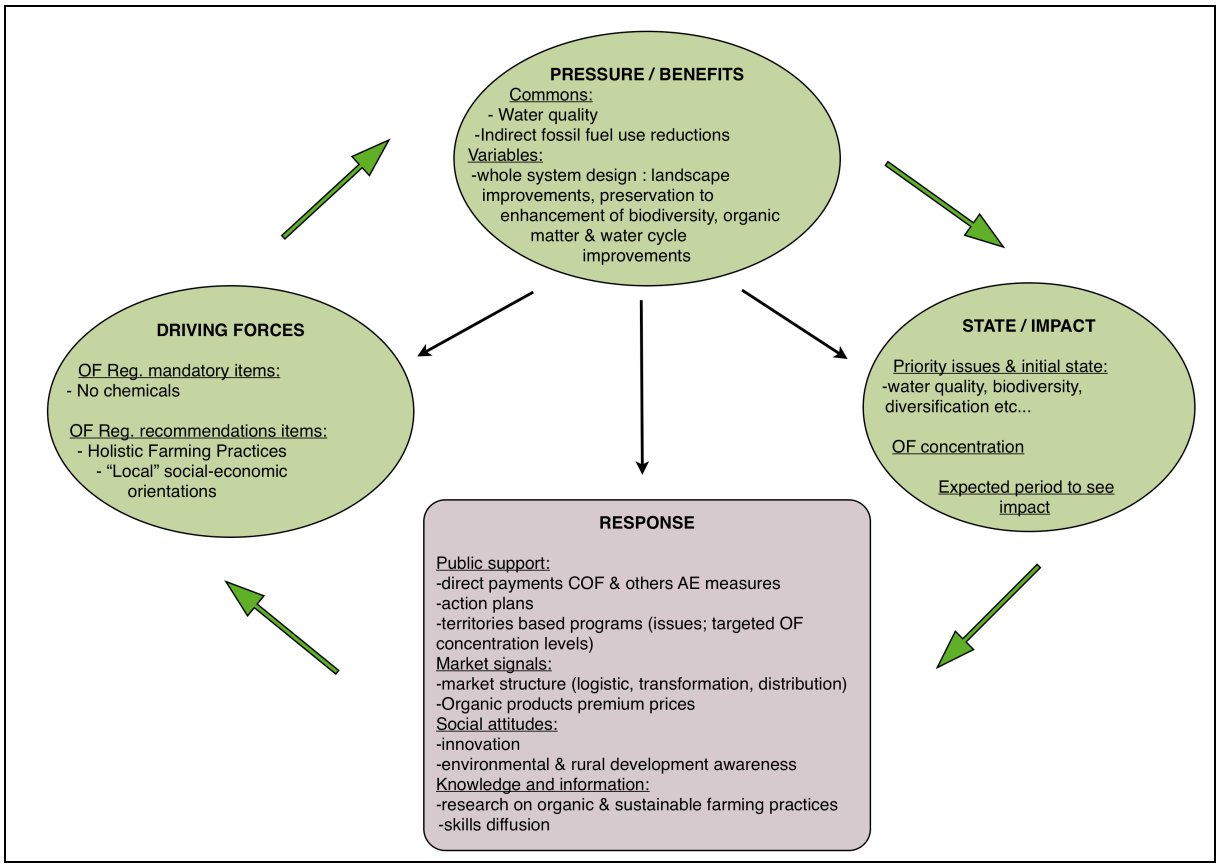


**Figure X:** A first draft of DPSIR model of OF to be detailed with in depth study of each items as proposed in the previous sections of this report, and basis for indicators selection.

## II.3 From DPSIR Of Organic Farming to an evaluation framework: the question of indicators

The DPSIR framework of OF, by identifying the main factors of influence at each step of the causal pathway can be used to chose and classified relevant indicators. An example of this method in provided in Annex 3 with the set of indicators defined for the evaluation of changes in relation to the DPSIR of EU agriculture presented Figure 3. Indicators selection for the evaluation of OF may benefit from the works undertaken by organisation such as EU Directorate General for Agriculture and Rural Development and EEA. Annex 4 & 5 are presenting some examples of indicators sets proposed by various partners in a program coordinated by the Eurostat organisation. Indicator selection is a difficult task since each indicator should respond to various constraints, according to criteria for the core set of indicators developed by EEA:

Indicator should:

1. Be Policy relevant
2. Monitor progress toward the quantified targets
3. Be based on ready available and routinely collected data
4. Be consistent in space coverage and cover all or most of EU countries

5. Be consistent in temporal coverage
6. Primarily be national in scale and representative for countries
7. Be understandable and simple
8. Be conceptually and methodologically well founded and representative.
9. Be Linked with management plan
10. Be produced in reasonable and “useful” time.
11. Be well documented and of known quality.

The selection of indicators for evaluation of OF impacts may be facilitated by the framework presented in the previous sections, since characterisation of OF is undertaken trough farm typology, social-economic orientation and management practices that are common to various agricultural evaluation concerns. Particularly, the framework for Agro-environmental measure evaluation is in close relation with concerns for OF evaluation.

## II.4 Global Discussion: From evaluation of Conversion to Organic Farming policy to it’s to improvement.

As hypothesised in this report, OF it-self is not a guaranty of best sustainable agricultural practices depending on farmer approach toward OF. Even if OF is an implicit incentive for adoption of sustainable SEO and FMP, because their implementation may improve agronomic efficiency and farmer income, it may not be sufficient in many cases, especially form the most recent conversion that are concerning previously specialised farms. Therefore, it appear that OF general impact is a change of habits concerning agricultural development shift from “green revolution concepts” to the “doubly green revolution concept” as defined by Altieri and Grifon. OF with it’s incentive of whole system redesign may both impact farming practices and social-economic orientation. Nevertheless, adoption of the most sustainable farming practice may be simulated by other complementary measure beside OF. Information, and skills diffusion are of great importance for this task, as well as other Agro-environmental measures. Actions toward organisation of OF market are also important, both as adoption factor, and also for matches with sustainable agronomic practices e.g. for long and diversified crop rotation adoption necessitates diversified commercial outlets for the crops that are composing the rotation. From the literature cited in the previous section, it appear very important that Action Plan at states and EU level, with substantial financial resources, target the objectives of knowledge; from it’s production trough research to it’s diffusion.

On the topic of farm management practices adoption by the newly converted organic farmers, the Austrian example gives some interesting procedure to drive farming development into most sustainable way, since most agri-environment measure can only be selected in combination with at least two other measures (Darnhofer 2006). This kind of approach may be very efficient to drive recent adopter of OF to the implementation of important measures in link with territorial issues, since different combination of measures could be designed in a territory specific way. Other kind of territorial issues modulation of AE measures could be imagined, for example to promote even more OF when water quality pesticides problems are to be solved. In that case some targeted concentration of organic farms in sensitive area may be defined. Furthermore, it is likely that some measures should be coordinated among farmers at territorial level, indeed, for water quality, or landscape issues, a territorial entity could coordinate farmers actions in a more efficient way.

# Conclusion

The work presented here is only an exploration of the mains characteristic that has to be taken into account in the perspective of the evaluation of OF impacts on Rural Development. Nevertheless, some key aspects have been indentified concerning the factors that are influencing both adoption of OF, and on the factors of development of the various modalities that can endorse OF. Some methodological frameworks are proposed to account the diversity of the “in and outs” of organic farming. These frameworks should of course be specified trough their application of different context. Moreover, this work toward and evaluation framework of OF impacts on rural development should be replaced in the more global framework of RDR evaluation, since a lot of factors are common with other evaluative concerns. Concerning evaluation of pressure and benefits of the various farm management practices and social-economic orientation various bibliographic review are necessary. It is assumed here that deepening the various relationships explored here will help to clarified the proposed conceptualisation framework, and will lead to a quite simple typology of organic farms encountered in EU territories. Then, links between such a farm typology and specific pressure and benefits are to be define. Finally, a clear organic farm typology related to impacts could be reach. Such a tool would allow a better evaluation of OF impacts in a given territory if share of agricultural models present in the territory are known. The overall evaluation could probabely reliy on indicators already developed by concerned organisation such as EEA. By the same way, it is likely that few of this existing indicators could be use to distinguish between the models included in the organic farm typology cited above.

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# APPENDICES

## APPENDIX 1 : RENEWED EU SUSTAINABLE DEVELOPMENT STRATEGY

**Adopted by the European Council on 15/16 June 2006**
http://ec.europa.eu/sustainable/docs/renewed_eu_sds_en.pdf

### KEY CHALLENGES

**CLIMATE CHANGE AND CLEAN ENERGY**
To limit climate change and its costs and negative effects to society and the environment.

**SUSTAINABLE TRANSPORT**
To ensure that our transport systems meet society's economic, social and environmental needs whilst minimising their undesirable impacts on the economy, society and the environment.

**SUSTAINABLE PRODUCTION AND CONSUMPTION**
To promote sustainable consumption and production patterns.

**BETTER MANAGEMENT OF NATURAL RESOURCES**
To improve management and avoid overexploitation of natural resources, recognising the value of ecosystem services

**PUBLIC HEALTH THREATS**
To promote good public health on equal conditions and improve protection against health threats

**SOCIAL INCLUSION, DEMOGRAPHY AND MIGRATION**
To create a socially inclusive society by taking into account solidarity between and within generations and to secure and increase the quality of life of citizens as a precondition for lasting individual well-being

**FIGHTING GLOBAL POVERTY**
To actively promote sustainable development worldwide and ensure that the European Union's internal and external policies are consistent with global sustainable development and its international commitments

### KEY OBJECTIVES

**ENVIRONMENTAL PROTECTION**
Safeguard the earth's capacity to support life in all its diversity, respect the limits of the planet's natural resources and ensure a high level of protection and improvement of the quality of the environment. Prevent and reduce environmental pollution and promote sustainable consumption and production to break the link between economic growth and environmental degradation.

**SOCIAL EQUITY AND COHESION**
Promote a democratic, socially inclusive, cohesive, healthy, safe and just society with respect for fundamental rights and cultural diversity that creates equal opportunities and combats discrimination in all its forms.

**ECONOMIC PROSPERITY**
Promote a prosperous, innovative, knowledge-rich, competitive and eco-efficient economy which provides high living standards and full and high-quality employment throughout the European Union.

### MEETING OUR INTERNATIONAL RESPONSIBILITIES

Encourage the establishment and defend the stability of democratic institutions across the world, based on peace, security and freedom. Actively promote sustainable development worldwide and ensure that the European Union's internal and external policies are consistent with global sustainable development and its international commitments.

## POLICY GUIDING PRINCIPLES

### PROMOTION AND PROTECTION OF FUNDAMENTAL RIGHTS

Place human beings at the centre of the European Union's policies, by promoting fundamental rights, by combating all forms of discrimination and contributing to the reduction of poverty and the elimination of social exclusion worldwide.

### SOLIDARITY WITHIN AND BETWEEN GENERATIONS

Address the needs of current generations without compromising the ability of future generations to meet their needs in the European Union and elsewhere.

### OPEN AND DEMOCRATIC SOCIETY

Guarantee citizens' rights of access to information and ensure access to justice. Develop adequate consultation and participatory channels for all interested parties and associations.

### INVOLVEMENT OF CITIZENS

Enhance the participation of citizens in decision-making. Promote education and public awareness of sustainable development. Inform citizens about their impact on the environment and their options for making more sustainable choices.

### INVOLVEMENT OF BUSINESSES AND SOCIAL PARTNERS

Enhance the social dialogue, corporate social responsibility and private-public partnerships to foster cooperation and common responsibilities to achieve sustainable consumption and production.

### POLICY COHERENCE AND GOVERNANCE

Promote coherence between all European Union policies and coherence between local, regional, national and global actions in order to enhance their contribution to sustainable development.

### POLICY INTEGRATION

Promote integration of economic, social and environmental considerations so that they are coherent and mutually reinforce each other by making full use of instruments for better regulation, such as balanced impact assessment and stakeholder consultations.

### USE BEST AVAILABLE KNOWLEDGE

Ensure that policies are developed, assessed and implemented on the basis of the best available knowledge and that they are economically sound and cost-effective.

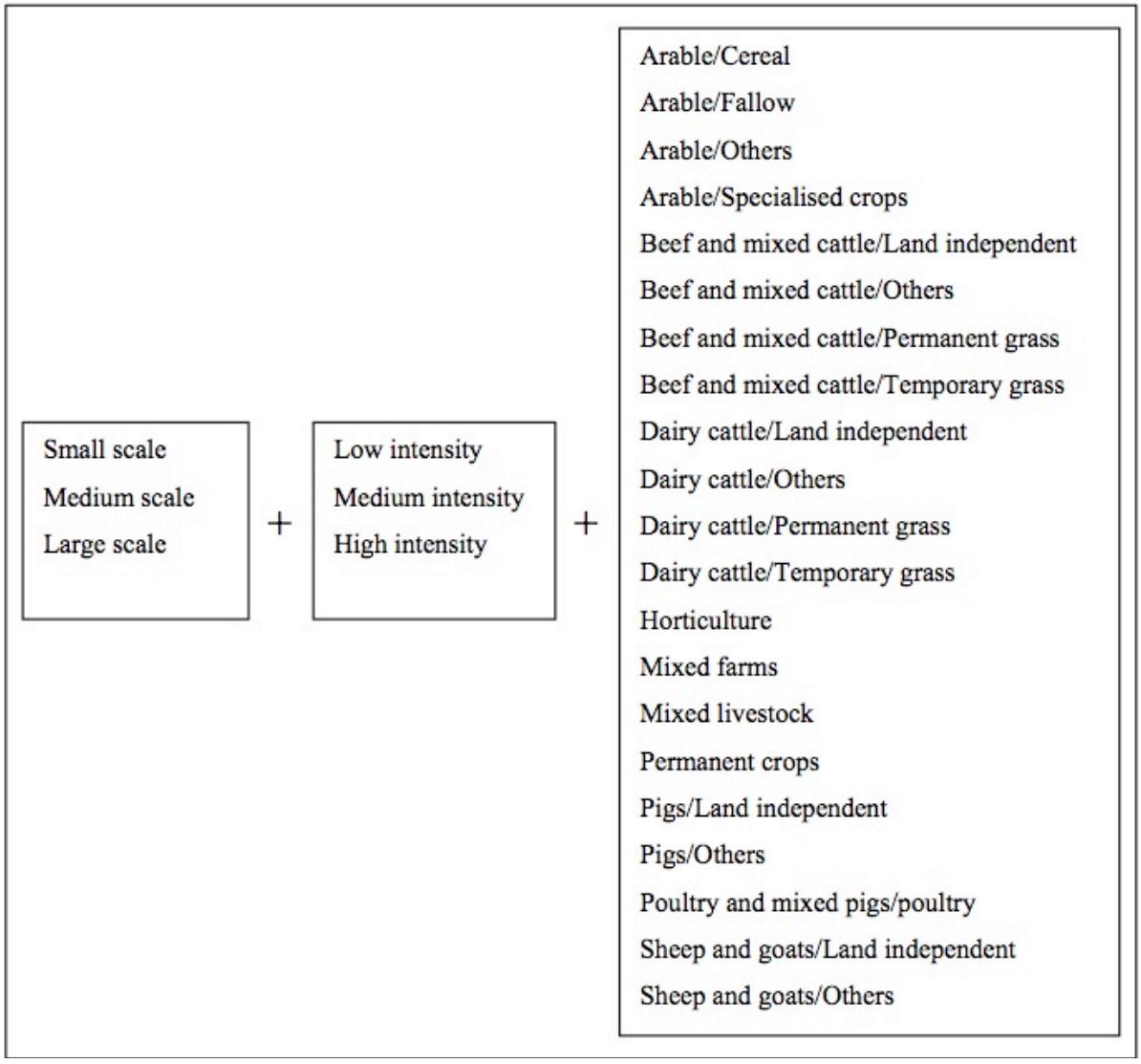
### PRECAUTIONARY PRINCIPLE

Where there is scientific uncertainty, implement evaluation procedures and take appropriate preventive action in order to avoid damage to human health or to the environment.

### MAKE POLLUTERS PAY

Ensure that prices reflect the real costs to society of consumption and production activities and that polluters pay for the damage they cause to human health and the environment.

## APPENDIX 2 : Overview of SEAMLESS typology of farms.



## APPENDIX 3 :

## APPENDIX 4 : Initial working list of key Rural Development Indicators – proposed by PAIS project coordinated by Eurostat

| Theme | Issue | Indicator name | Available from Eurostat | Available at NUTS III | No. |
|---|---|---|---|---|---|
| Population and Migration | Demography | Population density | ✓ | ✓ | 1 |
| | | % population aged 16 or under | ✓ | ✓ | 2 |
| | | % population aged 65 or over | ✓ | ✓ | 3 |
| | | Infant mortality rate | ✓ | ✓ | 4 |
| | Population Change | Average annual population change | ✓ | ✓ | 5 |
| | | **Regional net migration balance** | ✓ | partly | 6 |
| Social well-being | Service provision | Accessibility to public services | ✖ | ✖ | 7[i] |
| | Employment | % resident workforce working outside area | ✖ | ✖ | 8 |
| | | **Rural employment rate** | ✓ | ✓ | 9[ii] |
| | Quality of employment | % low skilled and high skilled workers | ✖ | ✖ | 10[iii] |
| | | % of part-time workers | ✓ | ✓ | 11 |
| | | % of employees on short-term contract and long-term contracts | ✖ | ✖ | 12 |
| | | **% workforce self-employed** | ✖ | ✓ | 13 |
| | Income | % of households in receipt of social payments | ✖ | ✖ | 14 |
| | | Average earnings per capita | ✖ | ✖ | 15 |
| | | Household disposable income | ✖ | ✖ | 16 |
| | Housing accessibility | No. of second homes | ✖ | ✖ | 17 |
| | | Average house price deviation from national average | ✖ | ✖ | 18 |
| | | Affordability gap[iv] | ✖ | ✖ | 19 |
| | | Rate of transactions (house sales) | ✖ | ✖ | 20 |
| | | % turnover in rented sector | ✖ | ✖ | 21 |
| Economic Structure & Performance (competitiveness) | Enterprise | Average no. of patents | ✓ | ✖ | 22 |
| | | No. of patent applications | ✓ | ✖ | 23 |
| | | R&D expenditure | ✓ | ✖ | 24 |
| | | **New business formation rate** | ✓ | ✖ | 25 |
| | | GVA per capita in manufacturing | ✓ | ✓ | 26 |
| | | % GVA in high-technology sectors | ✓ | ✖ | 27 |
| | Human capital | No. of university students | ✓ | ✖ | 28 |
| | | **Share of workforce with higher qualification** | ✖ | ✖ | 29 |
| | Business infrastructure | Supply of broadband services | ✖ | ✖ | 30 |

| Theme | Issue | Indicator name | Available from Eurostat | Available at NUTS III | No. |
|---|---|---|---|---|---|
| Economic Structure & Performance (diversification of rural economies) | Sectoral shares | Sectoral employment shares: high and low tech manufacturing | ✖ | ✖ | 31 |
| | | **Sectoral employment shares: shift share analysis** | ✖ | ✖ | 32 |
| | | % foreign owned companies | ✖ | ✖ | 33 |
| | | % employment in foreign owned companies by sector (manufacturing and tradable services) | ✖ | ✖ | 34 |
| | | **Enterprise size structure by employee numbers** | ✓ | ✖ | 35 |
| | | Net revenue by enterprise sector | ✓ | ✓ | 36 |
| | Farm households | **% share of pluriactive farm households** | ✓ | ✖ | 37 |
| | | % income from non-farming activities | ✓ | ✖ | 38 |
| | | % income from off-farm activities | ✓ | ✖ | 39 |
| | Tourism & recreation | **No. of bedspaces per 1,000 inhabitants** | ✓ | ✓ | 40 |
| | | No. employed in rural tourism accommodation providers | ✓ | ✖ | 41 |
| | | **Accommodation occupancy rate** | ✓ | ✖ | 42 |
| | | Share of rural enterprises in total tourism turnover | ✖ | ✖ | 43 |
| Economic Structure & Performance (Addressing the primary sector) | Agriculture | Farm size distribution (area/output) | ✓ | ✓ | 44 |
| | | Total gross output | ✓ | ✖ | 45 |
| | | Gross value added | ✓ | ✖ | 46 |
| | | **Farm net value added per holding, hectare and AWU**[v] | ✓ | ✖ | 47 |
| | | Farm business employment | ✓ | ✓ | 48 |
| | Forestry | Employment (permanent/temporary) | ✓ | ✖ | 49 |
| | | % area forested (on-farm/off-farm) | ✓ | ✖ | 50 |
| | | Total gross output | ✓ | ✖ | 50 |
| | | Total value added | ✓ | ✖ | 51 |
| | | Value of total annual gross fellings | ✓ | ✖ | 52 |
| | Fisheries, aquaculture & fish processing | Total gross output | ✓ | ✖ | 53 |
| | | Total value added (% of GDP) | ✓ | ✖ | 54 |
| | | Employment by home port | ✓ | ✖ | 55 |
| | | Value of landings (by local registered boats) | ✓ | ✖ | 56 |
| | | CFP Dependency Indicator[vi] | ✖ | ✖ | 57 |

## APPENDIX 5 : Final list of indicators fields related to agricultural practices proposed by proposed by PAIS project coordinated by Eurostat.

| *Area of management* | *Indicator included in PAIS II* |
|---|---|
| Nutrients | Use of soil analysis |
| | Evolution of leguminous area |
| | Crop rotation, incl. share of leguminous crops |
| | Type and capacity of storage facility for organic fertilisers |
| | Type of spreading equipment for fertilisers (organic and inorganic) |
| | Timing and number of slurry applications |
| | Integrated Nutrient Management |
| Soil | Soil cover by crops |
| | Other soil cover |
| | Number of passages between sowing and harvest |
| | Tillage systems |
| | Soil organic matter measurement |
| Pesticides | Type of pesticide spraying equipment |
| | Control/inspection of pesticide spraying equipment |
| | Integrated Crop Protection |
| | Management of empty pesticides packaging & unused pesticides |
| Irrigation | Irrigation method/equipment |
| Field margins | Field margin management |
| | Hedgerow management |

*Source:* EUROSTAT – PAIS - PROJECT 2003