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Assessing the relationship between certifications and farm sustainability

– A study of Short Marketing Channels and farmers' perceptions in Catalonia

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Certifieringar och jordbrukets hållbarhet

En studie om marknadsföringskanaler och jordbrukarnas perception av certifieringar i Katalonien

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FOREWORD

I landed in the Agroecology master's program after some years of individual research on organic farming. The interest for agriculture I suppose was always there. However, it became explicit during my bachelor in Environmental Sciences. I remember especially two important moments. The first was during a class when a professor showed a slide with the amount of Greenhouse gas emission from different economic sectors. Agricultural emissions were and are massive! The second was during a field trip in hydrogeology when I realise the high contribution of water contamination from intensive livestock farming. Consequently, my motivation to start the course was mainly environmental.

At the beginning of the program I was confused. I was not taught like I was used to. I was not in a unidirectional class where professors explain and students listen. Classes were open to debate; everyone's experiences and knowledge was considered. It was a bit difficult to adapt to this new system until I realise what agroecology program is about. The agroecology program is not about learning concepts, you can do that by yourself, agroecology program is about developing thinking skills.

Agroecological thinking is about connecting. It is about thinking through processes. It is dynamic. Furthermore, it is about being aware about other people perceptions on things and your values. Agroecological thinking it is also critical. As Charles Francis said in the ceremony of his Honorary Doctor degree from SLU "*agroecological teaching is the education of no mercy*". The food system face important issues therefore as agroecologists we need to be critic, open and energetic. After two years in the master's program I see things differently. Environmental issues cannot be tackled if the rest of issues are not tackled. Therefore, in parallel to the studies I have become more interested in social movements and activism as a collective way to transform our food systems and beyond.

In this thesis, I tried to put together all my interests to bring new knowledge to achieve the transformation of our food systems through a strong peasant society, eroded day by day by global neoliberalist policies. Agroecology is farmer empowerment, let them be heard.

Barcelona, November 2016

SUMMARY

The use of voluntary policies with the form of certifications or guarantee systems together with Short Marketing Channels seem a consolidated system aiming at 'resocialize' and 'relocalize' food chain actors which upon a sustainable food system must be built. In the organic food certifications two different approaches coexist in Catalonia, the European organic third-party certification (CCPAE) and a regional Participatory Guarantee System (PGS). The aim of the thesis is to compare on-farm sustainability under the regulatory scheme CCPAE alone and CCPAE + PGS to assess the outcomes of being part of a PGS in Short Marketing Channels of fresh vegetable products in Catalonia. Farmers from five farms in the PGS and four farms in the CCPAE from the Vallès Oriental and Osona counties were interviewed for the study. The study was based in the assessment of farm sustainability using SAFA and the study of certifications using ISEAL credibility principles. The relationships between the PGS and farm sustainability was drawn using DSRP method of systems thinking. PGS farm average and its CCPAE counterfactual presented similar patterns, in exception of the Governance dimension. Some differences could be attributed to the PGS action. Nevertheless, context (microlevel and macrolevel) offered valid explanations too. Relevant differences in economic, social and environmental dimensions were not found. Focusing on the governance dimension, the actions motivated from the certification providing the most important impacts were the participatory process which was used in all actions in the certification. Furthermore, the shared vision around sustainable development and agroecology motivated a close relation between stakeholders with personal communication about marketing issues but also about sustainability issues. Last, general non-compliance situations have been identified affecting the environmental dimension. The study of the PGS and its relation to farm sustainability represents the first study of its kind in Catalonia. The study indicates that the PGS presents a great potential to move towards sustainable development in short marketing channels in the organic Catalan food system, because in addition to the substitution and redesign processes of agroecosystem management is based in consensus democracy, horizontal power relations and a holistic approach to sustainability. Furthermore, the study suggests the detachment among farms and the CCPAE certification and it is just considered as a marketing tool.

Key words:

Sustainability, SAFA, DSRP, Participatory Guarantee Systems, Agroecology, Catalonia

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1. INTRODUCTION

Food systems include production, elaboration, distribution, marketing and consumption of food (Gamboa et al, 2016). The dominant agri-food system is characterized by globalization, industrialized modes of production and intensive use of resources (Knudsen et al., 2006:1; Di Masso, 2011) which has brought negative sustainability impacts (Forssell and Lankoski, 2014; IAASTD, 2009; IPES-Food, 2016). These circumstances have motivated the rise of different production and distribution forms, which have been categorized as Alternative Food Networks (AFN) (Renting et al, 2003) because divert from the industrialized system towards a focus of 'quality', 'place' and 'nature' (Higgins et al, 2008 citing Goodman, 2003,2004) and through a process of 'relocalization'[1] and 'resocialization'[2] of food (Binimelis & Descombes, 2010; Venn et al, 2006) try to provide closer and more trustworthy relations between producers and consumers (Venn et al, 2006).

Voluntary policies seem a consolidated system aiming at differentiate AFN products and to pave the way for the implementation of public policies (Radomski & Leal, 2015; Tallontire et al, 2012), habitually through a market based and consumer-driven approach (Koos, 2011). Those policies are referred as certifications or guarantee systems. Therefore, certifications are a "*regulatory mechanism animated by a complex governance politics in which great variety of actors pursue diverse interests*" (Higgins et al, 2008 citing Mutersbaugh et al. (2005: 381). Guarantee systems are based in two components: 1) the qualities of the products or processes[3] and 2) the procedure followed to verify the qualities of the product (Cuellar, 2009). The most common certifications are environmental label schemes or ecolabels[4] and organic food certifications the best known of these (Koos, 2011).

Organic certifications or organic guarantee systems, on the one hand, permit producers to show that offered products have been obtained using practices defined as organic and, on the other hand, consumers receive information about the compliance with some reference standards, which confers the desired characteristic to the product they want to purchase (Koos, 2011; Cuéllar, 2009). One way to categorize organic guarantee systems is based on the actors involved in the verification or control process (Cuellar, 2009). Accordingly, certifications can be: first- party (self-certification, a producer develops and control private standards); second-party (a group of buyers agrees which standards to implement and how to control them); third-party (several institutions regulate standards and farms pay external auditors to verify them) e.g. the European organic policy controlled in Catalonia by the CCPAE; fourth-party (multilateral agency defines standards and verification methods and firms do not pay external auditors to verify them); Participatory (a network of farmers and stakeholders defines standards and is verified through peer audits) e.g. Participatory Guarantee Systems (Hochreiter, 2011; Prakash and Potoski, 2006; Cuéllar & Calle, 2009).

[1] Venn et al (2006) uses the term 'respatialize'.

[2] Relocalization and resocialization processes refer to processes which reduce the cultural and physical distance between production and consumption.

[3] Per Ilbery et al, (2005) 'place' should also be considered.

[4] Currently, over 200 ecolabels coexist representing environmental, social and/or production qualities, with diverse legal frameworks from different governance bodies, different structures, and different areas of influence (Willer and Lernoud, 2015; Koos, 2011).

From a rural development perspective, short marketing channels (SMC) or short food supply chains[5] are as important as the choice of organic modes of production and concrete verification processes to connect stakeholders in local food initiatives (Nousiainen et al. 2009). SMC share value through the network, enhance trust between producer and consumer and articulate new political and market governance towards sustainability (Binimelis & Descombes, 2010). Therefore, Short Marketing channels create synergies with organic farming (represented by certifications) to enhance rural regeneration and regional development (Nousiainen et al. 2009). Are those synergies which according to Nousiainen et al. (2009) reflect the importance of local food systems through the promotion of economic and social benefits to communities which ends in the provision of opportunities to achieve rural sustainability.

In consonance with the rural development perspective of Nousiainen et al. (2009), Gliessman (2007:345) argues that a "[sustainable food system] *is one that recognizes the whole systems nature of food, feed and fiber production in balancing the multifaceted concerns of environmental soundness, social equity, and economic viability among all sectors of society, across nations and generations*". Therefore, it is the combination of 'resocialization' and 'relocalization' which upon a sustainable food system must be built (Gliessman, 2015:278-279).

This multidimensionality of certifications and sustainability requires frameworks and methods which allows its recognition. This thesis aims at compare two organic certifications operating in the vegetable short marketing channels in Catalonia, the CCPAE and a regional Participatory Guarantee System using the credibility principles of ISEAL[6]. And relate them to farm sustainability using SAFA (Sustainability Assessment of Food and Agriculture Systems) which is a universal framework developed by FAO.

The capacity of alternative modes of production represented by certifications to provide better sustainability outcomes in agroecosystems (farms) has been studied since its increasing market importance. Nevertheless, the studies focus on the mainstream alternative (organic European policy or CCPAE) compared with conventional modes of production. This study is interesting because explores the capacities of different alternatives (CCPAE and PGS) to provide sustainability outcomes.

1.2. Aims and Research Questions

This thesis aims at compare on-farm sustainability under the regulatory scheme CCPAE alone and CCPAE + PGS using SAFA framework and systems thinking to assess the outcomes of being part of a PGS in short marketing channels of fresh vegetable products in Catalonia.

[5] distribution channels when there is just one or none intermediaries between producer and consumer and where both actors maintain power on decisions (Binimelis & Descombes, 2010)

[6] ISEAL is an association of standard setting organizations and has developed credibility pronciples which gather important aspects for certifications to improve sustainability outcomes.

The research questions that guided the thesis are:

What patterns of on-farm sustainability arise between and within farms of the CCPAE certification and farms of the CCPAE + PGS certification in the vegetable market in Catalonia?

What are the differences between the Participatory Guarantee System and the CCPAE certification according to ISEAL credibility principles?

What are farmers' perceptions about how certifications to which they belong affect farm sustainability?

2. THEORETICAL BACKGROUND

The next section presents three main analytical frames and a body of literature used to structure and analyze the information gathered. First, Sustainable development is presented to understand what is required to frame farm sustainability. Second, agroecology permits the acknowledgment of trade-offs in the analyzed agroecosystems and Systems Thinking allows the structure of all the information. Finally, AFN are taken as a reference to contextualize in a broader picture the information obtained.

2.1. Sustainable Development

Sustainable Development strives to achieve the transformation of our food system. Since its inception has been immersed in a conceptual development process (Mebratu, 1998). Nevertheless, all definitions have some stable background: the acceptance that the world face an environmental crisis and the need for a change (Mebratu, 1998). In this thesis, the definition developed by FAO is used to find common background with SAFA. Therefore, FAO defines Sustainable Development as "*the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non - degrading, technically appropriate, economically viable and socially acceptable*" (FAO Council, 1989 in FAO, 2013). Using the conceptual analysis of Mebratu (1998) this definition has merged three definitions to generate an ultimate 'institutional version'. First, in the first part of the definition, it locates the solution in the necessity of a 'sustainable growth' driven by 'political consensus'. Second, acknowledges the necessity for 'eco-efficiency' driven by 'business interests' when arguing for technological change. Third, in the second part of the definition, stresses the necessity for 'primary environmental care'[7] driven by 'rural development' defining three basic dimensions where goals must be achieved in all of them and regulate trade-offs among them. The three basic dimensions are social, ecological and economic. Consequently, assuming the previous analysis of sustainable development change must be developed in the nation-states (macrolevel), communities (mesolevel) and business (microlevel). This thesis, examines how

[7] The sustainable development definition of IIED refers to 'Primary environmental care' to "*describe the process for progress toward sustainability at the grassroots leve*l" (Mebratu, 1998).

certifications (macrolevel and mesolevel) affect microlevel (farms). Nevertheless, sustainable development also depends on psychosocial implications rather than just political (Hill, 1998). Therefore, farmers' values and perceptions are equally important to the social environment in what farmers develop to achieve sustainability.

Sustainable development is a dynamic process Mebratu (1998) and sustainability is a state. Consequently, Hill (1998) differentiates shallow and deep sustainability. The first focuses on "*efficiency and substitution strategies of resources*" and application of 'curative solutions' while the other "*re-evaluates goals in relation to higher values and redesigns the systems*" and solves problems by 'prevention'. In this sense, measurement of farm sustainability becomes necessary to place farms in the sustainable development process. SAFA is a method developed to frame the sustainability state of a farm and based in the definition above analyzed (FAO, 2014). But equally important is to state how certifications may act about bringing this change together with farmers' motivations to grow organic or becoming part of a certification.

2.2. Agroecology

"*Agroecology is a way of redesigning food systems, from the farm to the table, with a goal of achieving ecological, economic and social sustainability*" (Gliessman, 2016). Consequently, it is "*the integrative study of the ecology of the entire food system, encompassing ecological, economic, and social dimensions*" (Francis et al., 2003). Therefore, Agroecology requires to draw connections between agronomy, sociology, anthropology, environmental sciences, ethics and economics, "*to embrace the wholeness and connectivity of systems*" (Francis et al, 2003) acknowledging the trade-offs between sustainability dimensions and the uniqueness of each place (ibid). Francis et al, (2003) referred to agroecology as a scientific discipline but Wezel et al., (2009) characterize agroecology as a science, movement and practice giving the perfect theoretical framework to study the relation between certifications and farm sustainability because embrace different scales in the study of food systems but allows for analysis in each scale.

In the microlevel, the goal of agroecology is to mimic productive agroecosystems with natural ecosystems, or "*being able to harvest biomass from a system in perpetuity because the ability of the system to renew itself or be renewed is not compromised*" (Gliessman, 2007:17). Agroecology builds sustainable food systems from the sustainability of agroecosystems (farms) which sustain it. In order to put the sustainability state of the farms under study in relation to other farms outside the study, the levels of conversion to sustainable agroecosystem design and practice will be used (Gliessman, 2015:278). Gliessman (2015:278-279;2016) propose five levels of conversion the first three levels encompass steps of conversion at the farm scale and two additional levels that go beyond the farm scale. "*The five levels are proposed to function as an outlining stepwise, evolutionary conversion process for the entire global food system*":

> Level 1: *"Increase the efficiency of industrial/ conventional practices in order to reduce the use and consumption of costly, scarce or environmentally damaging inputs."*
> Level 2: "*Substitute alternative practices for industrial/ conventional inputs and practices.*"

Level 3: "*Redesign the agroecosystem so that it functions on the basis of a new set of ecological processes*".
Level 4: "*Reestablish a more direct connection between those who grow food and those who consume it*."
Level 5: "*On the foundation created by the sustainable farm-scale agroecosystems of level 3 and the sustainable relationships of level 4, build a new global food system, based on equity, participation, and justice, that is not only sustainable but also helps restore and protect earth's life support systems*."

This grading should give a concise statement about the sustainability level of each farm and the farms as a group.

In addition, to its capacity for the study of sustainable food systems in the microlevel and mesolevel, agroecology also acknowledges the necessity to introduce farmer knowledge and skills into developing sustainable agricultural systems (Altieri, 2009) and consider "*human behavior as an important driving force in the system*" (Francis et al., 2003).

In conclusion, Agroecology permits the study of Guarantee Systems because allows to connect from the change in farming techniques to changes in the social context of agriculture (Gliessman, 2007:351), by focusing *"on structure and processes at each relevant systems level*" (Francis et al., 2003). This complexity necessitates tools which allows its analysis, and in consequence the application of systems thinking has increased in agroecology studies (Wezel et al., 2009).

2.3. Systems Thinking

Systems thinking is a field that aims to meet complexity with simplicity by "*focusing on contextual patterns of organization rather than specific content"* (Cabrera et al. 2008) and "*is agnostic so it can be applied to any topical domain or existing methodology*" (Cabrera et al, 2015). Systems thinking helps to think differently but does not help to solve problems by itself. However, the use of "*systems thinking perspective helps to uncover a viable solution*" to the possible problems in the system under study (Cabrera et al, 2008).

It has been used in several fields of study, being agriculture, sustainability and planning and evaluation (Cabrera et al, 2008) the most relevant in our study. Cabrera et al., (2008) found a strong relationship between systems thinking and evaluation and states that many ideas found in systems thinking were first established in the evaluation literature. Systems thinking is conceptual (Cabrera et al., 2008) and by exploring "*the pattern of relations between concepts and their environment*" define 'complex adaptive conceptual systems' (ibid). Accordingly, "*a concept is not merely its content but is a function of the context it is in*" (ibid) and "*the contextual patterns, not the specific content, are what we recognize as being uniquely systemic*". (ibid)

In this thesis, the DSRP framework (Cabrera et al, 2008; Cabrera and Colosi, 2008; Cabrera et al, 2015) proposed as a 'universal formalism' (Cabrera and Colosi, 2008) of the different

existing systems thinking approaches will be followed. "*DSRP provides the mechanism for a view of concepts as dynamic, patterned, evolving, adaptive and complex*" (Cabrera et al., 2008). DSRP stands for Distinctions, Systems, Relationships and Perspectives. "*First, Distinctions are based on things and ideas. The distinction rule helps to demarcate boundaries that separate the internal from the external. Distinctions affect the other rules. Second, Systems are based on parts and whole. The system rules recognize how parts and wholes affect each other and how by recognizing their relationships those become explicit. Its relation with perspective becomes important to understand the system we are describing and presenting. Third, Relationships differentiate between action and reaction. This rule connects the structural parts of a system with dynamical ones. Neglecting dynamical parts can lead to misguided concepts of emergence. Fourth, Perspectives differentiate between a point (the looker) and a view (what we look at*)" (Cabrera et al, 2015). "*The awareness created by this rule is helpful to unmask subjective realities*" (ibid).

Table 1. Four DSRP rules and its elements

Simple rule	Element 1	Element 2
Distinction (D)	Thing/idea	Other
System (S)	Part	Whole
Relationship (R)	Action	Reaction
Perspective (P)	Point	View

source: Cabrera et al, (2015)

Therefore, the use of systems thinking facilitates capturing relationships between certifications and on-farm sustainability, acknowledges the relation between the agrifood context, certifications and farm sustainability and introduces perspectives into the equation which becomes necessary to understand which system is being modelled.

2.4. Alternative Food Networks

Alternative Food Networks (AFN) are understood as "*forms of food provisioning with characteristics deemed to be different from, perhaps counteractive to, mainstream modes which dominate in developed countries*" (Tregear, 2011). Tregear (2011) overview on AFN literature differentiates three main bodies of research: Political economy, rural sociology and modes of governance and network theory. It is the third approach based on studies in modes of governance and network theory which has brought the most promising insides in the thesis. The first characteristic is that it focuses on the meso-level and conceptualizes AFN as a network of actors. Therefore, negotiation processes, control issues, codes of practice and development of competing bodies dominate this approach. Furthermore, analyses the processes on how knowledge is created or co-created (e.g. certifications) and its consequent effect on actors' interactions. This approach offers perspectives on how AFN evolve, allows for understanding why "*similar actors, with similar goals and agendas, end up pursuing different strategies*" and restudy concepts as "*trust, reciprocity and solidarity, being viewed as phenomena that are coproduced and manipulated by contesting actors/factors, through vehicles of certification/regulation*" (Tregear, 2011). Exploring this relation between AFN and

certifications Higgins et al. (2008) adds another body of study, the impacts of certification schemes on farmers and farm livelihoods.

Therefore, the acknowledgment of certifications as inherent parts of AFN permit understanding processes and to connect our case study results to a broader perspective and understand in what situation the PGS is in.

3. BACKGROUND

This section presents the main features of the current situation of the Catalan agrifood system and the Catalan organic agrifood system. In addition, it presents the development of the agroecological movement in Catalonia and introduces general characteristics of Participatory Guarantee Systems and the European organic certification

3.1. Catalan Agrifood System

Catalonia is an autonomous community situated in the north-east of Spain. It is an urban and industrial territory (Badal et al, 2011) with a population of 7.5 million (Idescat, 2016). The food industry in Catalonia (including beverages and tobacco) represented 17,9% of the total Catalan business volume in 2012 (Idescat, 2016a) and among them meat, wine, fats and oils and fruits represent the most important sectors (Segarra, 2014). This has converted the food system in one of the pillars of the Catalan economy (Badal et al, 2011). In 2008 was considered the most important agrifood regional European cluster (Peix, 2008). Therefore, agriculture has adapted to this market, led by the food industry, by expanding commodity crop monocultures[8], increasing farm extension, applying last technologic innovations and building infrastructures to support this development. This has left farmers dependent on agrochemical industry and fossil fuels, public policies and bank credits (Badal et al, 2011) and enhanced importation and exportation of agrarian raw materials and final products. All this seems to have benefited the concentration of food distribution in big commercial platforms controlled by transnational companies (Badal et al, 2011).

Figure 1. Localization of Catalonia in Spain Author: Hansen BCN Source: Wikipedia.org.

As a result, the system has left a weak agricultural sector. In 2015 agriculture represented 0,9% of the Gross Value Added[9] (Idescat, 2016b). The agrarian active population is decreasing annually and in 2015 was 1,55% of the active population in Catalonia (Idescat, 2016c). There

[8] GM Maize has been sown in Catalonia since 1998 to feed livestock, mainly pig production (Binimelis et al, 2009).

[9] In Spain agriculture represented 2,5% of the GVA and 1,5% in the European Union. (Idescat, 2016b)

is no generational replacement of an aging agrarian population because farmers have low profit margin and conceive the lowest salaries of the labor market (Badal et al, 2011). Furthermore, an increase in cost of production and a reduction of the prices perceived by farmers increase the labour insecurity which falls on immigrant laborers. All this circumstances denote the loss of the Catalan "peasant society"[10], its associated traditional agricultural landscapes[11] and local food distribution networks (Badal et al, 2011).

Besides social externalities developed above, there are also environmental externalities. The main problems are: aquifer pollution due to mainly intensive pig production, loss of soil fertility and high water consumption. (Badal et al, 2011)

3.2. Organic Farming in Catalonia

The first organic initiatives started during the 70s influenced by the French "agriculture biologique" and led by technicians and scholars. The products were sold through short marketing channels with a strong trust component. In 1990, the 'Consejo Regulador de la Agricultura Ecológica' (CRAE), organ in charge of organic certification in Spain, certifies the first farmers (Generalitat de Catalunya, 2006). In 1990, the Catalan administration created the 'Consell Català de la Producció Agrària Ecològica' (CCPAE), the organization which regulates the organic production in Catalonia (CCPAE, 2016). Catalonia was pioneer in organic farming, there were funded the first production advisory services and promotion associations, the first consumer cooperative and the first system of organic certification of Spain (Badal et al, 2011).

The inclusion of farmers in the organic certification is obligatory since 2010 if they want to sell their products as organic (CCPAE, 2016a). Catalan organic production present a positive tendency, in 2005 the number of certified organic producers in Catalonia was 683 while in 2014 was 2334 (CCPAE, 2016a). At present, 42% of organic product produced in Catalonia is sold in Catalonia, 26% in the EU, 19% in Spain and 13% outside of the EU (CCPAE, 2016a). The cultivated area for vegetables is 813 ha (CCPAE, 2016a). Furthermore, the cultivation of horticultural products, its manipulation and packaging achieve a sales volume of 15.733.653,20 € (CCPAE, 2015)

The interest of authorities to know the views of producers and consumers seems biased. On the one hand, the only study on organic producer perspectives developed in 2006 (Generalitat de Catalunya, 2006) found diverse viewpoints, some farmers were more environmentally conscious while others were motivated for the economic incentives (premium prices) organic agriculture can bring. On the other hand, studies on Catalan consumers have been developed in 2008, 2009, 2010, 2012 and the last in 2015 (CEO, 2015). This last study, found that 83,7% of Catalan consumers can distinguish organic products and 37,4 % consume organic products monthly. The quantity rises to 49,6% if occasional consumers are also considered but decrease to 25, 6% if weekly frequency is considered (ibid). The main reason to purchase organic

[10] In 2008 workers in agriculture represented less than 30% of the total of contracted people in the food system (Badal et al, 2011)

[11] This marginalization of agriculture has brought to the increase of forests, urban areas and big infrastructures (Badal et al, 2011).

products are health reasons (ibid). Consumers furthermore assume a surcharge in organic products (ibid) and consider that a reduction in price and a better presence in common sale points will incentivize the purchasing of organic products (ibid). The trust in labels among informed consumers is very high (77,4%) (CEO, 2015). The demand is concentrated in the metropolitan area of Barcelona, nevertheless the local and regional markets are more important than in other parts of Spain. (Generalitat de Catalunya, 2006).

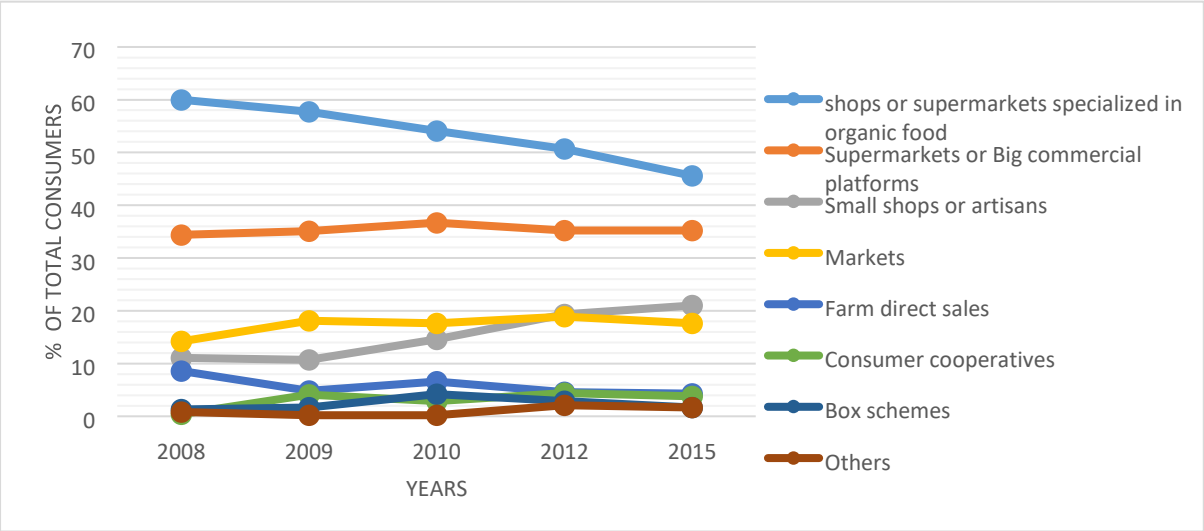


Figure 2. Catalan consumer marketing channel choice.
Author: Miquel Saludas Source: Data from CEO (2015)

Figure 2 show that 45,6% of habitual consumers of organic food prefer to buy their products in shops or supermarkets specialized in organic food, however this option has been reduced compared to the 60% of 2008. Markets and Supermarkets have maintained their market share since 2008 with slight accumulated increase in 17,6 % and 35,2% respectively. Short marketing channels present diversity of situations. Preference for small shops have increased from 11,1% in 2008 to 21% in 2015[12]. Farm direct sales have decreased in importance from 8,6% in 2008 to the current 4,3% with oscillations during those years. Consumer cooperatives from being very residual in 2008 (0,4%) currently is the choice of a 3,8%. Its peak was in 2012 with a 4,4%. Box Schemes are chosen for 1,7 % of consumers showing stability compared with results of 2008 (1,3%) but decreasing from 2010 (4,4%) (CEO, 2015).

Last, organic agriculture in Catalonia considers just officially certified producers. It is a growing market thanks to an important regional market; however, it has a strong exportation side. Marketplaces are controlled by big distribution platforms (specialized and generalists) and short marketing channels represent around 10-20 % of the sales depending on how many small shops can be considered. Therefore, it is a system based in a differentiated quality but following mostly the same distribution channels as conventional systems.

[12] Only small shops which buy directly to producer are considered inside short marketing channels. The shop is considered an intermediary.

3.3. Agroecology Movement in Catalonia

Agroecology in Catalonia is very related to food sovereignty. "*It is not possible to speak of food sovereignty without an organically sustainable agrarian production, socially just and culturally appropriate*" (Badal et al, 2011). Therefore, agroecology has grown as a complement to food sovereignty. Torremocha (2011) considers agroecology as the basis to achieve food sovereignty.

The origin of the current movement is the same as the official organic farming. Nevertheless, the two movements split when the administration recognize organic farming and started its period of 'conventionalization' (Pomar & Tendero, 2015; Badal et al, 2011; Di Masso, 2011). Nowadays the Agroecological movement is structured through small networks of small farmers, NGOs, seed banks or the movement against GMOs (Badal et al, 2011).

Furthermore, Di Masso (2011) stresses the relation between agroecology and short marketing channels to provide real transformative alternatives to the dominant agrifood system in Catalonia. This relation provides an alternative for small producers to sell their products and avoid the monopsony and oligopsony situations provoked by big distribution (Di Masso, 2011).

To sum up, the agroecology movement in Catalonia evolves hand in hand with food sovereignty. Nowadays, stills in the margins and organic farming still the 'mainstream alternative' in Catalonia. However, sociologist and small farmer groups perceive agroecology as the best way to transform the Catalan food system.

3.4. European Organic Certification and Participatory Guarantee Systems

The European Organic certification emerged to structure the organic farming movement and its practices (Moschitz & Stolze, 2009). Nowadays, it is ruled by the European Union under the regulation (CE) 834/2007 and it is obligatory if you want to sell the products as organic (Cuéllar, 2009) and to receive subsidies (CCPAE, 2013; Generalitat de Catalunya, 2006). It is a public voluntary standard because it is created by a public body and its implementation is voluntary (Tallontire et al, 2012). It belongs to each member state to decide how to control the policy implementation (European Commission, 2011).

Participatory Guarantee Systems (PGS) has been used to verify the quality of organic products before third-party certifications[13] (Willer and Lernoud, 2015). PGS present high diversity because they adapt to local conditions on which they develop and represent several social, environmental, productive and economic characteristics (Torremocha, 2012; May, 2008; De la Cruz, 2016). Therefore, Torremocha (2012) identifies three different approaches to define PGS based on those different characteristics. The first is built around locality, active participation of stakeholders, trust, social networks and knowledge exchange. The second is built on the capacity of the social environment to verify the process. The third emphasize its capacity to provide an alternative to smallholders and transform the food system through consumer

[13] 'Nature et Progrés' is a PGS in France functioning since 1972 (Willer and Lernoud, 2015), however the network exists since 1964. (Nature et Progrés, 2016)

implication and different production and marketing practices. However, all PGS share common basic elements: Participation, Shared vision, transparency, trust, horizontality, decentralization and continuous learning process (May, 2008; Cuéllar, 2009). PGS has received attention from researchers and practitioners of Agroecology and from the movement of food sovereignty (Di Masso, 2011; Cuéllar, 2009; Renting, 2003).

In conclusion, both certifications represent voluntary standards. However, on the one hand, European organic certification depicts from a centralized structure and spreads to EU member states. On the other hand, PGS are diverse and adapted to local conditions which difficult its characterization and definition.

4. MATERIALS

In this section, the two organizations in charge of the certifications studied are presented. The Area of study is also presented together with the farms in the study.

4.1. CCPAE

The 'Consell Català de la Producció Agraria Ecologica de Catalunya' (CCPAE) is the only competent control authority in charge of the compliance with the Organic Legislation and Organic Certification in Catalonia. This authority was conferred by the General Director of Agriculture and Livestock (Generalitat de Catalunya, 2015).

Nowadays and since 15/2000 law CCPAE is considered a "*Corporation of Public Right with its own legal personality, financial autonomy and full capacity to act, in order to comply with the functions derived from the regime applicable to the ecological agricultural production*" (Generalitat de Catalunya, 2007). The decree 180/2001 (modified by the decree 269/2001) applied the law above mentioned and adapted the functions of the CCPAE to the new juridical context and to the European Norm EN 45011 equivalent to ISO 65 which stablishes the general criteria which certification product institutions must comply with (ibid).

Consequently, the CCPAE oversees the control system and register of operators, broadcast knowledge and applications of organic farming and its products, propose actions to the competent administration about organic farming, the internal council management and regulations (Generalitat de Catalunya, 2007).

4.2. La Xarxeta

La "Xarxeta de Pagesos Agroecològics" can be translated in English as "the [little] Network of Agroecological Farmers". La Xarxeta is a farmer-to-farmer network which aims at creating a model of rural development based in social justice, solidarity, cooperation and sustainability (La Xarxeta, 2016a). Its farmers are influenced by agroecology as a practice and a movement. The structure follows a bottom-up approach build on Local Node Assemblies, a General

Assembly and Commissions (La Xarxeta, 2016f). First, farmers are gathered in Local Node Assemblies by territoriality. The main functions are to discuss node specific issues, reach node consensus on general issues and decide participation in commissions. In addition, node assemblies oversee audit new participants in the PGS (La Xarxeta, 2016d). Second, the General Assembly gathers all the members of La Xarxeta. Three mandatory assemblies per year are performed to inform strategic decisions (La Xarxeta, 2016e). Finally, the organizational structure is complemented with two other organs the Control and Coordination Commission and Working Commissions. The Control and Coordination Commission manages General Assemblies and controls compliance's agreements. It is composed by a delegate of each node (La Xarxeta, 2016f). Working Commissions are in charge of concrete topics as formation, PGS, Commercialization and publicity, and socialization. (La Xarxeta, 2016g). Nowadays, its area of influence is Catalonia.

The network has 5 main characteristics which organize its functioning: 1) assembly and consensus decisions which all bodies must follow. 2) self-managed and no influenced by external actors. 3) Autonomous from the political power because there is no relation with it. 4) Open to all productive projects which comply with the aims and established principles and are disposed to integrate to the network through a PGS. 5) Non-discriminatory from gender, origin or other personal reasons (La Xarxeta, 2016f)

The main objectives of the network are: 1) to practice agroecology, its techniques and processes, 2) to practice social, economic and cultural transformation, ensure sustainability through knowledge and agroecological product exchange (local and affordable), develop formation of participants in La Xarxeta in terms related to the network activities and organization (agroecology, farmer culture, self-management, etc.). 3) to manage guarantee procedures 4) to defend the autonomy of farmers through direct marketing, fair and horizontal and consolidate the solidarity with consumers. 5) to enhance product exchange among experiences through common scheduling of crops and facilitate surplus exchange. 6) to order products together. 7) to activate the communication among members of La Xarxeta. (La Xarxeta, 2016h)

4.3. Area of Study

The study focuses in two counties of Catalonia (Figure 3). The two counties, Vallès Oriental (orange) and Osona (green) are inland counties in the province of Barcelona. Nevertheless, on the one hand, Vallès Oriental is very close from Barcelona and that conditions its development. The population of Vallès oriental is 400.375 inhabitants (Idescat, 2016d) occupied in industry

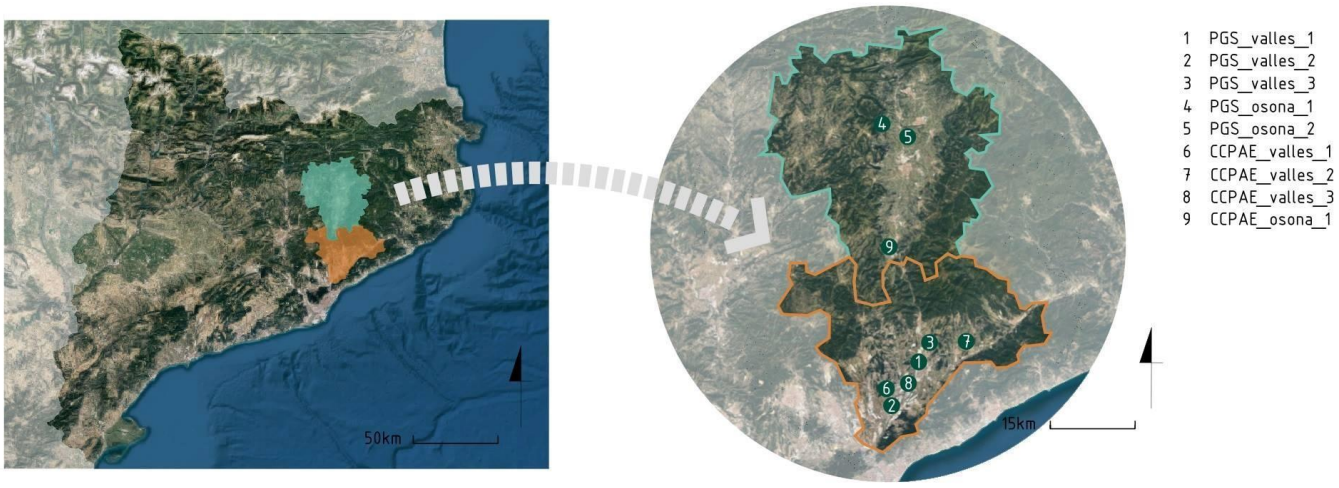


Figure 3. Maps of Vallès Oriental and Osona and the situation of the farms
source: Google Earth author: Minnami Henriksson

and services. On the other hand, the population in Osona is 154.925 inhabitants (Idescat, 2016e) occupied in industry and services but with a stronger presence of agriculture.

Catalonia has a diverse physical geography which defines a diverse climatology in nearby areas. Nevertheless, Catalan climate can be characterized by temperate winters and hot and dry summers, with average temperatures around 3 to 7°C and 25°C respectively. The precipitations oscillate between 350 and 400 liters/year. The climate of the two counties varies and Vallès Oriental is characterized by a Mediterranean climate and Osona by a humid continental Mediterranean climate with abundant precipitations and lower temperatures.

Agriculture in Vallès Oriental is characterized by cereals and fodder to feed cattle. In Osona the main agricultural activity is pig production. Horticulture is practiced in both counties with lower activity in Osona. The areas where horticulture is concentrated in Catalonia are in the coastal area including el Baix Llobregat, Maresme i Baix Camp.

4.4. Selection of Farms

The farms are characterized by its certification. Therefore, in the study there is two groups of farms. Farms which are regulated by the official certification and farms which are regulated by the official certification and the Participatory Guarantee System (PGS), so all farms are organic certified by the CCPAE.

First farms in the PGS are presented. The second keyword in the code represent the county. All farms in the PGS belong to the same local node (figure 3).

PGS_vallès_1 has evolved from an organic collective farm[14] in the year 2000 to the current farm managed for a couple with one full-time employee, one seasonal employee and an accountant which works one morning a week. The woman farmer (40) is an agricultural engineer and the man (45) has professional agricultural studies. They manage 1,5 ha. of diverse horticulture production next to the family house. Furthermore, they manage 2,5 ha. of cereals

[14] One of the first farmers to practice agroecology in Catalonia.

in two different locations to feed animals which they use to work on the farm. However, they also own heavy and light machinery. The farm sells through box schemes to diverse consumer cooperatives and groups, it sells also to other farmers, schools, restaurants and does direct sales on-farm. It is an organic farm "*because* [a farmer] *should produce in a way which respects nature, produce healthy products and respects the territory*" (PGS_vallès_1 farmer).

PGS_vallès_2 has evolved from a cooperative farm in the year 2008 to the current situation of two partners and two full time employees. The two partners are two women, one is a geographer and the other is an agricultural engineer (35 and 34). It is a 2 ha. farm of diversified horticultural production. Farmers do not live on the farm because they rent the land to an old farmer in a protected agrarian area. They own light machinery. The farm sells through box schemes to diverse consumer cooperatives, other farmers and restaurants. It is an organic farm "*because we wanted to participate in a well-intentioned system for all and we decided to produce* [food] *and therefore, it must be organic*" (PGS_vallès_2 farmer).

PGS_vallès_3 is a farm managed by one farmer coming from a family of farmers. The farm started in 2009 as a cooperative farm with three partners. The farmer (34) manage 3 ha of diversified horticultural product which rents from his father who raise pigs and grow cereals. The farmer has professional agricultural studies and live in the farm. The farmer owns light machinery and use heavy machinery from his dad. The farm sells through box schemes to private consumers which come to the farm, restaurants, a specialized shop, other producers and schools. It is an organic farm "*for conviction and to recuperate traditional agriculture*. […] *Is an act of rebellion and coherence to give something to the society. I am a farmer and I can give that*" (PGS_vallès_3 farmer).

PGS_osona_1 is a farm managed by three partners. The enterprise started in 2010 with two of the current partners. Both men, one of them (39) agricultural engineer with a master in organic farming and another in biodiversity management. The other partner (39) was a secondary school teacher without farming experience. The third partner, a woman (35) incorporated in 2015 with professional education in social education. The enterprise started into two different locations and nowadays is concentrated in 2 ha. in a land property of one of the partners. The enterprise owns light machinery. The farm sells through box schemes in different municipalities in the county delivered to households or collection points, sells to other producers and occasionally to organizations. It is an organic farm "*because the production has associated some features as proximity, direct contact, the farmer stablishes a relation with the consumer. We wanted to avoid industrial agriculture*" (PGS_osona_1 farmer).

PGS_osona_2 is a farm managed by a couple and has one employee to do paperwork three mornings a week. The enterprise started in 2009. The woman has a nurse bachelor (35) and the man (38) a high school degree. The enterprise manages 2 ha. in the woman family farm. They own light and heavy machinery. The farm sells in a local market, through box schemes and to other producers. It is an organic farm *"because we did not study any other option, we consider that organic production is the most coherent*" (PGS_osona_2 farmer).

The farms which only hold the European Organic certification are represented with the CCPAE code. The second keyword represents the county (figure 3).

CCPAE_vallès_1 is a family enterprise. The farmers a dad (+65) and a son (45) are a pensioner and a pluri-employed with a high school degree, respectively. They produce organic in the last

10 years on a land that the father has managed all his life. They do not live on the exploitation. The enterprise produces 2 ha. of diversified horticultural product and 6 ha of cereals and legumes. The enterprise owns light and heavy machinery. They sell to an "agroshop" of their farmer association, to schools and other farmers. Some products are sold direct to consumers in the farm. It is an organic farm "*because it is a growing market and we prefer this agriculture to conventional agriculture*" (CCPAE_vallès_1 farmer).

CCPAE_vallès_2 is a farm managed by three partners and a part-time employee. The enterprise started in 2012 in a land property of the family of one of the partners. The enterprise manages 2,5 ha. of diversified horticultural product. The three partners are men, one is agricultural engineer with a master in organic agriculture (33), another (32) studied Sports sciences and the last holds professional studies in landscape and gardening (34). They do not live in the exploitation. The enterprise owns light and heavy machinery. They sell in a local market, through box schemes, specialized shops, restaurants and cooperatives. They produce organic because "*if it was not organic we will not do it*" (CCPAE_vallès_2 farmer).

CCPAE_vallès_3 is a farm managed by a couple and one full-time employee. The farm was a former dairy farm property of the man's family. The man has professional education in agriculture (45) and the woman is an agricultural engineer (40). The enterprise transformed its production in 2012 and currently has 2 ha. of diversified horticultural production and 10 ha of cereals and olive trees. Furthermore, they sell eggs. All production is organic. They live in the farm. The enterprise owns heavy and light machinery. They sell all the product in farmer's markets around the county. The enterprise produces organic "*because is what we eat and therefore is what we want to sell*" (CCPAE_vallès_3 farmer).

CCPAE_osona_1 is a farm managed by a couple with a part-time employee. The enterprise started in 2006 in a land where they are sharecroppers[15]. The enterprise manages 3ha of diversified horticultural product and 1 ha of fruit trees. The man was a nurse (39). The enterprise owns light and heavy machinery. The enterprise sells the products in farmer markets and direct sales on-farm. The farm was a former member of the PGS. The enterprise produces organic "*by conviction*" (CCPAE_osona_1 farmer).

5. METHODOLOGY

This section presents the research design with special emphasis on the construction of a counterfactual. Explains the process of data collection and presents the methods used for data analysis and how were applied in this thesis.

5.1. Research Design

The thesis is based on an ex-post comparative analysis or a snapshot study (Tallontire et al, 2012) on the sustainability of multiple farms under different certifications and it is based on

[15] Information about the share taken by the owner are not known, if any.

cross-sectional data. Furthermore, the study does not strive to create a baseline for further studies.

Studies comparing the impacts of different certifications schemes on the producer level has grown accordingly to the increasing popularity of such schemes (Blackman & Rivera, 2011). Tallontire et al., (2012) and Blackman & Rivera (2011) in their reviews of agricultural certifications state the inclusion of a credible counterfactual as crucial to be able to attribute impacts to a project or policy intervention. Nevertheless, Tallontire et al., (2012) considers qualitative studies and participatory quantification of perceptions enough for an outcome and impact evaluation. Tallontire et al., (2012) justifies the use of qualitative methods in sustainability assessment of certifications due to the limitations on how much information producer organizations can collect on a regular basis, and make them available for an ex-post study. Therefore, considers that the use of mixed methods becomes a valuable tool when assessing rural social realities. Nonetheless, the evidence of an impact should be taken only as partial evidence. Blackman & Rivera (2011) consider that qualitative studies cannot construct a credible counterfactual because it is not based in statistical data.

Counterfactual

The farms under CCPAE certification were chosen from the list of producers from the same counties available in the webpage (CCPAE, 2016b) and they have served to construct our counterfactual. The counterfactual represents how the situation would have been if the Participatory Guarantee System would not be in place. Accordingly, the selection of CCPAE certified farms was determinant. The following observable characteristics have been pursued: Location: Vallès and Osona counties.

Farm size: The farms should be the same size or in the same interval as farms in the PGS.

Marketing channels: Farms should use short marketing channels. In this thesis we will follow the definition of Binimelis & Descombes (2010). Short Marketing Channels have maximum one intermediary between producer and consumer. Distribution is not considered.

Time growing organic: Farms should be inside the same interval than farms under PGS + CCPAE.

Dedication: The farmer should work full-time in the exploitation.

The farmer goal: Farmer should be motivated by sustainability.

The ideal situation was to match by pairs the farms of CCPAE+PGS with similar farms under CCPAE. However, that was not possible (table 2). The average results on sustainability obtained under CCPAE certification constituted the counterfactual.

Table 2. Farm's considered characteristics to construct a counterfactual

	location	*Farm size (ha)*	*SMC**	*Time*	*dedication*	*goal*
PGS_vallès_1	*vallès*	*1,5*	*yes*	*2000*	*full-time*	*sustainability*
PGS_vallès_2	*vallès*	*2*	*yes*	*2008*	*full-time*	*sustainability*
PGS_vallès_3	*vallès*	*3*	*yes*	*2009*	*full-time*	*sustainability*
PGS_osona_1	*osona*	*2*	*yes*	*2010*	*full-time*	*sustainability*
PGS_osona_2	*osona*	*2*	*yes*	*2009*	*full-time*	*sustainability*
CCPAE_vallès_1	*vallès*	*2*	*yes*	*2006*	*part-time*	*economic*
CCPAE_vallès_2	*vallès*	*2,5*	*yes*	*2012*	*full-time*	*sustainability*
CCPAE_vallès_3	*vallès*	*2*	*yes*	*2012*	*full-time*	*sustainability*
CCPAE_osona_1	*osona*	*3*	*yes*	*2006*	*full-time*	*sustainability*

*Short marketing Channels

The difficulty to isolate the relation between certifications and farm sustainability is one of the biggest challenges. Blackman & Rivera (2011) argue the need for statistical techniques to create a counterfactual to correct bias on non-randomized certification initiatives as our PGS. Nonetheless, Melo and Wolf (2005) in their study comparing environmental impacts on Ecuadorian bananas the only criterion followed was farm size. Therefore, considering the features of organic vegetable production in Catalonia those observable characteristics seem enough to identify sustainability outcomes from certifications.

Furthermore, the use of semi-structured interviews allows asking participants for direct perceptions about how the certification has affected their farm sustainability. This method it is considered as an alternative approach for constructing a counterfactual when statistical matching is not possible (Carden et al., 2009). The combination of both methods should allow for a good reliability of the results.

5.2. Data Collection

The information was gathered through interviews, direct observation and secondary data.

5.2.1. Interviews

The information was gathered through semi-structured interviews between the 21 of March and 11 of April of 2016 lasting from 55 minutes to 143 minutes of recorded interviews. There were two main topics of information required. First, the information required for SAFA. The questions were developed following the SAFA interview guideline (FAO, 2013) and available in the appendix 1. Second, information about the certification scheme. The questions about certifications focused on understanding things according to the meaning people give to them (Taylor, 2005:101) and draw a final boundary on the system studied which indicated what is inside and outside (Midgley, 2000:36). Other interviews were performed to gather information about the PGS certification. CCPAE information was gathered from internet and from email correspondence from members of the CCPAE.

5.2.2. Observation

Direct observation complemented the information of semi-structured interviews. Participant observation (Bernard, 2005:348) was developed in each farm through a farm visit, in consequence the time spent on each farm was between 2 hours and 5 hours with an exception of one of the farms which time escalate to 12 hours. Time conditioned my observations and understanding. The data obtained by participant observation is intuitive (Bernard, 2005:355) but valuable to find patterns on organizations (Bernard, 2005:419). During the farm visits participant observation on practices followed was essential to contrast the information received from the farmer and the one observed. When contradictory data arose, the data collected by the researcher was used. Furthermore, the researcher assisted to an audit visit in one of the farms of the PGS from a farm outside the study in August 2016.

Secondary data, literature review and expert information complemented data collection.

5.3. Data Analysis

Data analysis of farms' sustainability was based on SAFA, an indicator-based sustainability assessment. The analysis of certifications' information was developed using the ISEAL principles for credible and effective sustainability standards systems (ISEAL,2013) to structure the information. Finally, DSRP systems thinking method served to structure the discussion when comparing certifications and assign farm sustainability outcomes to the PGS certification.

5.3.1. Indicator-Based Sustainability Assessments

The use of multi-criteria sustainability assessments has grown side by side to the acknowledgment of agriculture's multifunctionality and multidimensionality (Binder et al, 2009). Furthermore, the capacity of those methods to inform decision-making for further developments has benefited its expansion in what are now known as Multi-Criteria Decision Analysis (MCDA) (Binder et al, 2009). The indicator-based sustainability assessments have grown as the main tool in MCDA and is now widely applied when dealing with complex socioenvironmental systems (Binder et al, 2009; Marchand et al, 2014).

According to the indicator-based sustainability assessments classification, presented by Binder et al, (2009) based in normative, systemic and procedural dimensions, there are top-down farm assessments, top- down regional assessments and bottom-up regional assessments. The way SAFA was used on this thesis reflects a top-down farm assessment, because indicators calculation and determination are structured before going to the farm and indicator interaction is not well stated. However, the use of systems thinking try to cover this weakness. Furthermore, the results should be easily discussed with farmers.

Marchand et al, (2014) framework about key characteristics of sustainability assessments at farm level serves to complement the explanation about SAFA's application in this thesis. Marchand et al, (2014) describes eleven key characteristics (Figure 4).

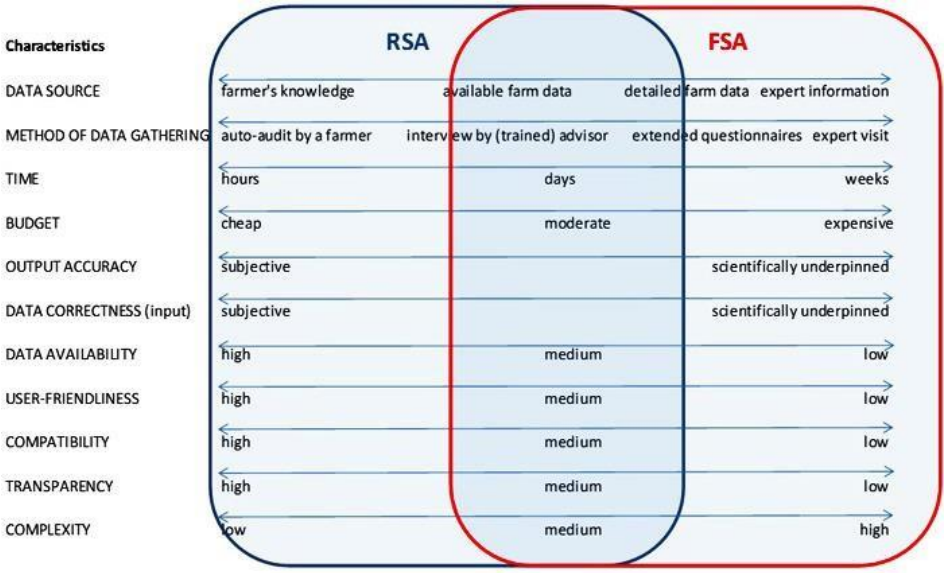


Figure 4. Key characteristics of Rapid Sustainability Assessments and Full Sustainability assessments.
Source: Marchand et al., (2014)

According to the information presented in the figure 4 the thesis is based in a Rapid Sustainability Assessment (RSA), because farmer's knowledge or ready available data was used. The assessment was performed in hours' time, was cheap and carries a high degree of subjectivity because is based on farmers stating their results but no document was checked. Marchand et al, (2014) states that RSA "*raise awareness and make a farmer think about different issues related to sustainability*", but it is not a suitable way to monitor sustainability like for certification purposes.

5.3.2. SAFA

The indicator-based sustainability assessment chosen was SAFA (Sustainability Assessment for Food and Agricultural systems). However, exist several tools for sustainability assessments of food systems (Schader et al. 2014). However, FAO has developed SAFA to become a universal framework applicable all over the world and therefore generate comparable results among different locations and biotopes. SAFA is a multidimensional and multi-functional method developed by FAO to assess sustainability of agricultural enterprises. It is based in the use of indicators which compile information in four dimensions of sustainability (Governance, Environmental, Social and Economic). The different dimensions are represented through different themes, divided in subthemes which are composed of different indicators. The importance of this method and the preparation it needs to be developed requires explanation. Specific contextualization points are explained below for general information consultation of SAFA guidelines and indicators is recommended (FAO, 2013). Table 3 summarizes all themes and subthemes calculated in this thesis:

Table 3. SAFA themes and subthemes calculated in the thesis

Themes	*Subthemes*		
G_GOOD GOVERNANCE			
G1_CORPORATE ETHICS	*Mission Statement*		*Due Diligence*
G2_ACCOUNTABILITY	*Holistic Audit*	*Responsibility*	*Transparency*
G3_PARTICIPATION	*Stakeholder Dialogue*		
G5_ HOLISTIC MANAGEMENT	*Sustainability Management Plan*		*Full-Cost Accounting*
E_ENVIRONMENTAL INTEGRITY			
E1_ATMOSPHERE	*Greenhouse Gases*		*Air Quality*
E2_WATER	*Water Withdrawal*		*Water Quality*
E3_LAND	*Soil Quality*		
E4_BIODIVERSITY	*Ecosystem Diversity*	*Species Diversity*	*Genetic Diversity*
E5_MATERIALS AND ENERGY	*Material Use*	*Energy Use*	*Waste reduction and Disposal*
C_ECONOMIC RESILIENCE			
C1_INVESTMENT	*Internal Investment*	*Long Ranging Investment*	*Profitability*
C2_VULNERABILITY	*Stability of Production*	*Stability of Supply*	*Stability of Market*	*Liquidity*
S_SOCIAL WELL-BEING			
S1_DECENT LIVELIHOOD	*Quality of Life*		*Fair Access to Means of Production*
S3_LABOUR RIGHTS	*Employment Relations*		
S4_EQUITY	*Non-Discrimination*		*Gender Equality*
S5_HUMAN SAFETY AND HEALTH	*Workplace Safety and Health Provisions*		

Source: Author

Indicators

"*Indicators are specific measurements or assessments that provide evidence as to whether certain condition exists*" (FAO, 2013). Indicators are either quantitative or qualitative. SAFA is developed using three different types of indicators:

Target indicators are based on the existence of planning, written or not, about designed and followed sustainability farm strategies. However, the capacity of farmers to explain their goals about concrete sustainability issues were also considered. Target indicators were calculated by the default rating and do not necessarily reflect performance (FAO, 2013)

Practice based indicators account for which practices have been implemented. Therefore, lists with feasible practices were developed using information from SAFA indicators, literature review and farm in-situ practices. Practice indicators do not measure actual impacts but gives a good estimate of performance (FAO, 2013).

Performance indicators are focused on outcomes. The incapacity to collect some primary data led to the non-calculation of some performance based indicators. This restrained the results' quality and did not allow for the creation of a baseline required for the creation of a rigorous counterfactual (Blackman and Rivera, 2011). In environmental integrity is difficult to collect data and when there is the possibility to collect, one metric is not enough to give an idea about the sustainability of the farm therefore nothing was calculated (FAO, 2013).

Rating of Indicators in the governance, economic and social dimensions

SAFA follows a 5 scale indicators rating (Table 4). Nevertheless, not all 5 scores are used. By default, SAFA indicators just contain rating for best and unacceptable. Therefore, in the SAFA developed by this study (Appendix 2) there are indicators with 2, 3 or 5 available scores.

In the Governance, Social and Economic dimension all subthemes are calculated by calculating all indicators in the subtheme.

Rating of subthemes in the governance, economic and social dimensions

All sub-themes and indicators have the same weight in reference to its theme or subtheme. The sum of the indicator's scores was done and divided for the maximum possible score giving a score between 0 and 1 for each subtheme. Later, the mean among subthemes was done representing the result for each theme. Therefore, the results between 0 and 1 represent percentages. An easy way is to give points to each color (table 4):

Table 4. Rating followed in rating indicators in governance, social and economic dimensions and themes and subthemes in the governance, social, environmental and economic dimensions

RATING	SCORE	PERCENTAGE SCORE
BEST	5	80-100 percent
GOOD	4	60-80 percent
MODERATE	3	40-60 percent
LIMITED	2	20-40 percent
UNACCEPTABLE	1	0-20 percent

Source: FAO (2013)

Rating of indicators and subthemes in the environmental dimension

In this case, just target and practice indicators were calculated. Therefore, performance indicators were considered excluded and the total possible subtheme score was considered without the mentioned performance indicators. In the environmental dimension indicators follow a hierarchy of weights: performance indicators > practice indicators > target indicators. Environmental practice-based indicators therefore become the indicators with more weight. Furthermore, in this thesis practice-based indicators were calculated following a percentage rating scale in consonance to the number of practices applied in the farm from the lists developed (appendix 4). Following the same scale as for rating subthemes (table 4).

The rating of the environmental indicators was done following table 5:

Table 5. Rating of environmental indicators

RATING	TARGET INDICATOR POINTS	PRACTICE INDICATOR POINTS	PERFORMANCE INDICATOR POINTS
BEST	1	2	3
GOOD	0.75	1.5	2.25
MODERATE	0.5	1	1.5
LIMITED	0.25	0.5	0.75
UNACCEPTABLE	0	0	0

Source: FAO (2013)

Therefore, the maximum for each subtheme was calculated according to the maximum points possible according to the calculated indicators. Then the achieved results were divided by the maximum possible results for each subtheme. Rating at the theme level was done by doing the mean among subthemes as in the other dimensions (table 4).

Aggregation of Results

The aggregation of results of all farms was done at the theme level. All the themes have the same weight in SAFA. The visualization of data is done in a series of amoeba graphics representing CCPAE and CCPAE + PGS farms. For the aggregation of results a matrix representing themes and farms was developed in order to gather the results (Appendix 5).

The analysis of results should be interpreted as how farmers are working to increase the sustainability- baseline.

5.3.3. Certification Assessment

For the assessment of the certification characteristics the ten credibility principles of certifications developed by ISEAL (2013) were used. Their character is qualitative.

1. Sustainability: "*Scheme owners clearly define and communicate their sustainability objectives and approach to achieving them*".
2. Improvement: "*Scheme owners seek to understand their impacts and measure and demonstrate progress towards their intended outcomes*."
3. Relevance: "*Standards are fit for purpose. They address the most significant impacts; only include requirements that contribute to their objectives; reflect best scientific understanding and relevant international norms; and are adapted where necessary to local conditions.*"
4. Rigor: "*All components of a standards system are structured to deliver quality outcomes*."
5. Engagement: "*Standard- setters engage a balanced and representative group of stakeholders in standards development*."
6. Impartiality: "*Standards systems identify and mitigate conflicts of interest throughout their operations, particularly in the assurance process and in governance*."
7. Transparency: "*Standards systems make relevant information freely available about the development and content of the standard, how the system is governed, who is evaluated and under what process, impact information and the various ways that stakeholders can engage*."
8. Accessibility: "*To reduce barriers to implementation, standards systems minimize costs and overly burdensome requirements*."
9. Truthfulness: "*Claims and communications made by actors within standards systems and by certified entities about the benefits or impacts that derive from the system or from the purchase or use of a certified product or service are verifiable, not misleading, and enable an informed choice*."
10. Efficiency: "*Standards systems refer to or collaborate with other credible schemes to improve consistency and efficiency in standards content and operating practices*."

The principles are based upon certification structures and operations. Therefore, principles help to assign possible outcomes derived from the certifications.

5.3.4. Interviews

The analysis of interviews when explaining certification perceptions focused on identifying common themes (Taylor, 2005:108).

5.3.5. Systems Thinking

The framework DSRP (Cabrera et al, 2008; Cabrera and Colosi, 2008; Cabrera et al, 2015) served to structure the information.

Distinctions are composed by things/ideas and other. Things/Ideas consist on themes of onfarm sustainability (SAFA themes) and certification characteristics (ISEAL credibility principles).

Systems are composed as parts and whole. The whole is the PGS and the parts the different SAFA themes in the average farm and ISEAL credibility principles.

Relationships are actions and reactions. Therefore, they represent feedback loops or causalities. Actions are things developed to fulfil the PGS. Reactions are things of farm sustainability affecting the development of the certification.

Perspectives differentiate between points and views. The point will be the farmer and researcher about how sustainability (view) is affected.

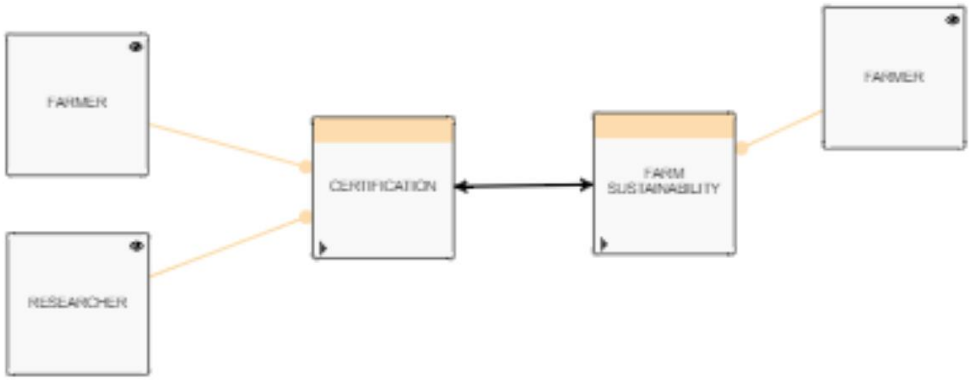


Figure 5. DSRP applied to the case study.

Source: http://metamapapp.cabreraresearch.org/

6. RESULTS

The results are structured in three different parts. The first part explains the analysis of certifications to give a picture of the two certifications. The second part presents the results of SAFA assessments. The third part presents farmers perceptions on the different certifications on which they belong.

6.1. Certifications Credibility

There are two sections. The first section presents the CCPAE certification. The second section presents the PGS certification.

6.1.1. CCPAE Certification Credibility

Sustainability

The CCPAE certification is built around **Organic Agriculture** (OA). OA is understood as an alternative agricultural production system which emphasize the use of natural and sustainable techniques and eliminate those which can damage **product quality** or the **environment** (Generalitat de Catalunya, 2006). Furthermore, the certification introduces the necessity to maintain a high diversity of food to comply with **consumer demand** for organic products (Generalitat de Catalunya, 2011) and defines organic vegetable products as products cultivated

without synthetic chemical fertilizers or pesticides and which do not contain residues of those substances. (CCPAE, 2016c). These descriptions are aligned with European Commission's definitions and objectives (European commission, 2014).

European Organic agriculture certification depicts from the **council regulation** (EC) No 834/2007, which establishes the principles and the general norms of functioning of the organic system in member states. The commission regulation (EC) no 889/2008 concretize the basis of implementation of the previous (CCPAE, 2013; European Commission, 2014b). Furthermore, it defines the **EU commission** as the standard owner. Consequently, the Catalan Ministry of Agriculture elaborates the interpretation and application of those policies in Catalonia through three documents where European organic policy is translated into practice (Generalitat de Catalunya, 2016).

The certification identifies Catalan **organic products** and regulates all the steps on the organic food chain: **production, preparation** and **distribution** for products which one wants to commercialize as such. Farms are **audited in-situ** and are authorized for each product which they want to sell as organic. It is issued by CCPAE and **accredited** by ENAC (CCPAE, 2016d) and must be renewed every year (CCPAE, 2013). Producers which comply receive a **certificate** and can use the **label**. The European label must be used when selling in the European Union or the CCPAE label when selling in Catalonia.

The organic certification is based in **compliance or non-compliance**. There are three levels of non-conformity: minor, severe and very severe. A Minor non-conformity considers problems of administrative character which do not affect the production method and the ones which cannot be considered severe or very severe. Severe non-conformity situations are resultant from lack of control or precaution in the activity, installations or production processes or from repeating a minor non-conformity for a year. Very severe non-conformity occurs when the organic production method and its labelling in food products is violated or repeating a serious non-conformity for a year. Each non-compliance level has a differentiated sanction (CE 834/2007).

Improvement

The improvement of standards depends on the improvement and modification of the organic farming **European policy**. Several amendments have been done since 2007 and currently the European commission is working in a new policy which will repeal council regulation (EC) no 834/2007. The aims are to "*adjust the EU legislation to the current situation in the EU market*" (European Commission, 2016). In the Catalan level the Ministry of Agriculture is in charge to translate the policy into implementation and CCPAE is in charge to its compliment (CCPAE, 2016a; Interview with a CCPAE member). Furthermore, the EU is in charge to introduce improvements into policy based on **scientific trends** in agreement with expert groups recommendations (European Commission, 2014a). At the regional level, CCPAE introduces new knowledge by collecting **statistics** about the organic sector and its economic features and **exchanging information** with IFOAM, INTERECO and EOCC. The Technical Direction is in charge to maintain collaboration with these bodies (CCPAE, 2016a).

The **assurance system** is improved through different **audits**, the continuous revision of the system and the resolution of non-conformities and complaints from operators (CCPAE, 2016a;

Interview with a member of the CCPAE). The '**Junta Rectora'** as the maximum ruling organ in the CCPAE decides the strategy and objectives each year and are executed by the Technical Direction (CCPAE, 2016a).

The accreditation body ENAC develops **analysis on samples** taken in the market place. Furthermore, the CCPAE has a collaboration with the Ministry of Agriculture, Livestock, Fisheries and Food and the Ministry of Business and Knowledge to detect fraud in the market to avoid unfair competition for operators (CCPAE, 2016a).

Relevance

The certification focuses in concrete practices and products that can be used and validated. It is based on outcome, and aspects of approach around organic farming are just considered as supportive aspects but they are not controlled and there are no premiums for their application.

Standards of organic certification referred to crop production: (Generalitat de Catalunya, 2012)

"*Organic certification will be withdrawn from seeds or material where GMO are present*"

"*In exception of permanent grasslands, perennial crops and flooded crops, the operator must establish a multiannual crop rotation including legumes and other green manure crops every three years "*

"Where organic fields limit with non-organic fields the producer must establish measures as the installation of windbreaks and the establishment of contamination security zones or other methods which the control authority considers adequate."

"If contamination security zones are established the products harvested in this area could not be commercialized as organic. The destination of this products must be documented to prove they were sold as non-organic."

"Self-consumption of products from contamination security zones is allowed if it is reflected in the field notebook."

"Weed management could just be developed by using crop rotation, mulching, solarization or mechanical and thermic means."

"Soil disinfection is allowed by using the heat of solar energy after mulching the soil with a polyethylene sheets and biofumigation."

"The use of an in-vitro technic to produce vegetative propagating material is permitted in organic farming, when any non-allowed product in organic farming is used."

"The use of living organisms for biological pest control (as insects and nematodes) are allowed."

"Only fertilizers and soil conditioners present in the Annex I of organic legislation can be used. Farmers should safe documents justifying the necessity to use the product." "The quantity of manure applied in the farm could not exceed 170 N kg/ha year of used land. For the calculation, just the agricultural surfaces with application of fertilizers will be considered. The limit is applied only to farm manure, dried manure and dehydrated chicken manure, humus from solid excreta and composted manure, and liquid stool."

"It is forbidden the use of farm manure, dried manure and dehydrated chicken manure, humus from solid excreta and composted manure, and liquid stool from intensive livestock farming."

"Organic plant production shall use tillage and cultivation practices that maintain or increase soil organic matter, enhance soil stability and soil biodiversity, and prevent soil compaction and soil erosion."

"The fertility and biological activity of the soil shall be maintained and increased by multiannual crop rotation including legumes and other green manure crops, and by the application of livestock manure or organic material, both preferably composted, from organic production."

"For the calculation of three years in the multiannual crop rotation, fallow time will not be counted."

"The cultivation of a green manure must have a minimum of 70 days."

"The use of biodynamic preparations is allowed."

"Mineral nitrogen fertilizers shall not be used."

"All plant production techniques used shall prevent or minimize any contribution to the contamination of the environment."

"The prevention of damage caused by pests, diseases and weeds shall rely primarily on the protection by natural enemies, the choice of species and varieties, crop rotation, cultivation techniques and thermal processes."

"For the pest management only the products present in the Annex II of the present regulation." (Catalan regulation)

"Use of microorganism's preparations can be used to improve soil conditions or nutrient availability in the soil or crops."

"To activate the compost use of plant based preparations or microorganism's preparations can be used."

"Hydroponic production is forbidden."

"The storage facilities can just be cleaned by using sulfuric acid, Nitric acid, acetic acid and citric acid."

Exceptional production rules:

"*It is possible to use seeds or vegetative propagating material no produced according to organic production when it comes from a conversion period farm, there is no available organic product of that specie or variety, when seeds have been not treated with phytosanitary forbidden in organic production*."

The certification is relevant to any kind of organic producer.

Rigour

According on how they are managing the development of the new organic policy, there are three main actors involved in the **EU legislative process**: **European Commission, Council of Ministers and European Parliament** (European commission, 2015c). The European Commission is in charge to write the policy proposal, the Council of Ministers to discuss about the new legislation (representing the member states) and the European Parliament sets opinions about the legislation through COMAGRI and COMENVI committees (ibid).

The EU certification process follows a **third-party certification and accreditation**. The CCPAE is **accredited** since 2005 by the "Entidad Nacional de Acreditación" (ENAC) for the compliment of the normative **UNE-EN ISO/IEC 17065** which recognizes CCPAE technical capacity to certify organic production (CCPAE, 2016d). The compliance is revised periodically. Furthermore, control bodies must be accredited in consonance to the European standard **EN45011** (European commission, 2011).

The CCPAE commission of Human resources is in charge to manage personal, contract revision of conditions and formation (CCPAE, 2016a). Furthermore, farm auditors or inspectors are supervised and trained by CCPAE Technical Director and managers of each specific area. The CCPAE has formation´s procedures of new personnel. Furthermore, specific **continuous formation** is pursued to improve efficiency levels and adapt new knowledge to an ever-changing regulation (CCPAE, 2016a). The accreditation body certifies personnel capacities and field performance.

In addition, to individual formation procedures for personnel CCPAE has developed methodology to assess farms (CCPAE, 2013). Farm audits are based on the revision of the **field notebook** where operators are required to report on: number of people working on the farm and applies phytosanitaries, machinery used for these treatments, plots under organic production, dates of fertilization and soil work, dates of application of phytosanitary, register of treated seed, register of post-harvest treatments, storage and transport, register of raw materials, register of sales, register of harvests and yields (CCPAE, 2013) **Information** gathered is **kept**. Furthermore, the inspector can choose to take soil and plant **samples**. Farms are audited annually and random audits are conducted on risk based (CCPAE, 2016a)

Engagement

At the European level the consultation with stakeholders about policy development which will be translated in standard setting is done through "seeking the opinion of the **Advisory Group** on Organic Farming which comprises representatives of the European organic farming sector". and a process of **public consultation** (European Commission, 2015; European Commission, 2015a).

At the regional level, the standard content is proposed by CCPAE and must be approved by its governing body (Junta Rectora) which it is composed by 3 producers, 3 elaborators/ importers/ marketers, 3 representatives of the administration and 3 consumers' representatives. The '**Junta Rectora'** members are chosen by **vote every 4 years** (CCPAE, 2016a).

CCPAE has a "**procedure for complaints and dispute resolution**" (CCPAE, 2016a) as stated in ISO17065 (Interview with a CCPAE member). Farmers may fill a form available on the CCPAE website to do proposals (Interview with a CCPAE member).

Impartiality

The CCPAE has a special committee dealing with impartiality. It is the '**Comitè de parts'**. Its function is to maintain the impartiality and supervise the certification activity as stated in **UNE-EN ISO/IEC 17065.** It is composed by members of the 'Junta Rectora'. The 'Technic director' and the 'Secretary of the Junta Rectora' assist to the meetings. (CCPAE, 2016a). An **annual report** by the Technical Director states possible elements affected by impartiality.

Transparency

The webpage of the European commission in organic farming **displays information on policy development:** steps followed, stakeholders involved, governance bodies involved and departments of the EC involved (European Commission, 2016; 2015a;2015b; 2014c)

At the regional level the **competent authority'**s, which is the **Ministry of Agriculture** of Catalonia, **webpage** displays legislative, research and informative documents on organic farming in Catalonia, Spain, Europe and internationally supporting certification's claims (Generalitat de Catalunya, 2016a). However, it is the **control authority** which is in charge to explain how the **standards** are set and modified (CCPAE, 2016e). Some practical documents are accessible just if you are an operator.

The information about the structure of the assurance system and assurance body is available on **CCPAE´s webpage**. The chain of authority is clear and stated in different documents on different legislative levels from the EU level (EC) 834/2007, (EC) 889/2008 to regional level Llei 2/2014, de 27 de Gener and Decret 180/2001, de 26 de juny (Generalitat de Catalunya, 2016)**.** The **assurance body** also provides a list of current operators stating the certificate expiry date (CCPAE, 2016b). Furthermore, in the webpage there is a document establishing which information is made available to clients. There is no information about auditors, stakeholder input and the result of CCPAE audits at the regional level (Interview with a CCPAE member).

Financial information is available in CCPAE's annual reports. The main sources of income are fees and other revenues. Nevertheless, other revenues are not concretized. Furthermore, they receive funding from 'Pla de Desenvolupament Rural' to enhance participation of producers and promote activities related to product quality (CCPAE, 2016a). In 2015, CCPAE prepared one guided audit for journalists (CCPAE, 2016a)

Accessibility

Fees are paid to be certified. An opening fee of 242,58 € (VAT included) just paid the first year under this name. After the second year, this fee is transformed to the certification fee. The same amount is charged to each operator. Fees are used to run the register and certifying the data.

Furthermore, there is a fee for product covered (variable import + 21% tax) which contributes to cover the costs of inspection. The variable import is due to type of product, number of hectares or certified products, turnover. i.e. there is a baseline fee of 110 euros until 1 ha of horticultural product plus 9 euros/ha added. Finally, there are also extraordinary fees for different procedures and other fees related to purchase of seals, labels, delivery notes and issuance of certificates on request (CCPAE, 2016f). CCPAE do not pay fees to farmers that cannot pay (Interview with a CCPAE member)

The **process of accepting clients to the scheme** is based in 4 steps (CCPAE, 2013). 1) the clients fill an application for registration and attaching the required information. 2) The CCPAE verifies the documentation. Requirements for more information are done during this step. When information is complete an inspection is scheduled. 3) In-situ inspection and emission of an inspection report validating that the normative of organic production is followed. If everything is correct the procedure moves to the next step. If the normative is not fulfilled the inspector provides corrective actions which needs to be fulfilled before registration. 4) Evaluation of the certification committee. The committee analyses all the documentation and if the decision is positive the producer receives a register number, the registration resolution and the certification of conformity.

The certification does **not** provide **advisory services** because "*Advisory is incompatible with control and certification of organic products*." (CCPAE, 2016a). Nevertheless, the assurance body list approved capacity-building providers [16](CCPAE,2013). "*The competent authority must take steps to ensure that its staff are required not to disclose information acquired when undertaking controls*" (European commission, 2011) Truthfulness

The EU states that the logo guarantees that: "the production respects nature; the products are produce in a sustainable way; the operators of organic production are controlled once per year by control bodies or control authorities to ensure that they respect all organic rules and all health and consumer protection rules; genetically modified organisms are not allowed; for food, there are strict limitations to the use of chemical pesticides and fertilizers; most of the inputs for farm production come from the farm itself using local resources and local knowledge; each and every time you buy an organic product from your supermarket, or choose an organic wine at your favorite restaurant, you can be sure they were produced according to strict rules aimed at respecting the environment and animal welfare " (European Comission, 2014d).

Nevertheless, CCPAE or other bodies does not analyze the environmental impact of the certification (Interview with a CCPAE member).

Efficiency

The organic certification works following **ISO rules**, **the Codex Alimentarius** and the **Organic Legislation** which have been founded following those two systems. The hierarchy defined above based in third party certification and accreditation serves to review the system. The European commission as system owners regulates which bodies can provide this assurance and accreditation. All assurance bodies in Spain are assured by ENAC. Therefore, there exist common background between countries to facilitate trade. Nowadays CCPAE certification is

[16] "Tecnics-dinamitzadors territorials en producció agroalimentària ecologica a Catalunya" and "Associacions de Defensa Vegetal"

recognized by United States USDA organic certification, Produto orgànico (Brasil), Delinat (Switzerland, Germany and Austria), Biosuisse (Switzerland), Krav (Sweden), AB (France) and Bio Siegel (Germany).

The assurance bodies in Spain are dependent on each autonomous community. All the different assurance bodies are grouped under a non-profit organization called **INTERECO**. Among different functions this body "*study, monitor and improve the application of the normative and coordinate the different members to optimize the control functions, certification and promotion of products precedent from the organic agriculture*" (CCPAE, 2016g). CCPAE has no records of another organic certification operative in Catalonia (Interview with a CCPAE member).

6.1.2. La Xarxeta PGS Credibility

Sustainability

"**Agroecology** goes beyond no contaminating the land and obtaining products free of toxics." (La Xarxeta, 2016b). It is based in: 1) **Agroecological farming practices** as the recuperation of traditional practices, knowledge exchange, conservation and recuperation of local varieties, rationalization of natural resources, waste reduction and adequate management, enhance biodiversity and non-use of GMO. 2) Practice **social transformation** by ensuring a living wage to dignify farmers' life and confront their exploitation, economic viability and autonomy of farms, common programming and organization of production, cooperation, commitment and solidarity among farmers. 3) **Economic transformation**: trust among farmers and consumers, short marketing channels and seasonality, guarantee equitable and fair prices and work towards food sovereignty, support responsible, solidary and critical local economies. 4) Practice **cultural transformation** through agroecology advocacy, knowledge exchange and consensus decision-making (ibid). The PGS serves as a tool to support the creation of a social, environmental and economic rural model based in social justice, solidarity, cooperation and sustainability (La Xarxeta, 2016c).

The PGS standards were set in 2009 through a **participatory process**. Brain storming about the general themes that should be covered was the first step. Later, those themes were further developed in more concrete attributes by different working groups set for this purpose and from extraordinary character comprising all members of the network at that time (Moya, 2009; La Xarxeta, 2016c). The **network** is the standard owner and the control body. The directives of the standards are available on internet (La Xarxeta, 2016a) and will be presented in the Relevance section.

The PGS certification identify a **productive project** which accounts for product, farm and farmer relations and values and complement the official certification[17] (interview with PGS committee member, 2016). It regulates all steps of the food chain for non-transformed products:

[17] *"The idea is not to substitute the official certification. Because we do not have enough capacity now. The idea is to complement the official certification and in some case, validate a project with no official certification. An initial aim was to use the PGS to guarantee an agroecological product and dispense the official certification. But nowadays the substitution is not possible."* (interview with PGS committee member, 2016)

production, storage, distribution and commercialization. Farms are **audited in-situ** every 2 or 2 and a half years (ibid). There is no issuance of a formal certificate. Nevertheless, "*being part of the network can be used as a marketing tool to differentiate working in a farmer network with being just distributors*" (ibid).

The PGS is based on attributes divided in three ranks. The first rank is composed by 11 attributes which its **compliance** with is essential to gain access to the network. The noncompliance of one of them is sufficient to be excluded. Second rank is composed by 22 attributes which are considered crucial in to evaluate globally or holistically if a new farm is accepted to the PGS it is based in strong, weak and very weak performance. The third rank is composed of 57 attributes and elements which are interesting to know to enhance common knowledge and **collective learning.** It has an informative function (Moya, 2009; Interview with PGS committee member, 2016).

There is **no sanction regime**. Non-compliance situations are brought to the general assembly and the situation is discussed. An oral agreement about the necessity to develop actions to comply is taken (Interview with the PGS committee member, 2016).

Improvement

The standard system is still in process of development. Just one round of audits has been done since the inception of the PGS. After this first round of audits, common weak points of the productive projects are identified and attributes which influence directly or for which low marks are achieved are revised. The rank or the evaluation procedure of the significant attributes is adjusted (interview with PGS committee member, 2016). The **PGS committee** is in charge to apply the PGS, define its continuity and improve the process (La Xarxeta, 2016d). Therefore, the work to develop further standards and improve the assurance system is responsibility of the PGS committee. However, any change must be **agreed in assembly** (ibid).

The PGS gives importance to the improvement of the productive projects. For that reason, specific improvement proposals are done by the auditors and accepted in assembly. Furthermore, common weak points are tackled by the elaboration of training courses organized by the **formation committee** (La Xarxeta, 2016d; La Xarxeta, 2016e). New methods and practices are transmitted through farmers but they are not incorporated in the PGS "*Therefore, new projects do not need to comply with those practices if the rank 1 is fulfilled*" (Interview with PGS committee member, 2016).

"*There is **no exhaustive control in market places**. There is an informal control based in information gathered from other sources or external informants*" (interview with PGS committee member, 2016).

Relevance

The PGS has develop their own standards. Those standards are not available for publication. There is no available information on how those are rated, benchmarked, the objective pursued and how they should be applied. Nevertheless, the guidelines are available on internet and presented in this section.

The directives are classified into two groups: technical directives and social and economic criteria. Technical directives refer to agricultural aspects and resource management. Social

and economic criteria include marketing, labour rights, organization and other productive aspects.

Technical directives:

Soil fertility management (La Xarxeta, 2016j)

"*Soil management should increase soil organic matter, increase its stability and biodiversity and prevent compaction and erosion."*

"Reduce the application of fertilizers as growth stimulators or natural mineral fertilizers."

"The use of nitrogen fertilizers is forbidden."

"Soil conservation must be based in organic matter application as manure, compost, green manure, crop residues and mulching, crop rotation and intercropping."

"Farmers should prioritize to use organic local manure. When manure comes from conventional agriculture it must be always composted and their content of toxic residues analyzed. Slurry is not accepted."

Crop management (La Xarxeta, 2016k)

"*GMO are not allowed. If genetic contamination occurs crops affected must be burnt and publicly denounced. If crops susceptible of being genetically contaminated, an analysis must be done to ensure they are free from GMO."*

"A minimum of 10-15 species must be cultivated per season (Spring- Summer or Fallow-Winter)."

"*Complementary biodiversity is essential and the farm must provide a rich auxiliary ecosystem and crop association must be prioritized."*

"Long crop rotations with fallows and green manure must be followed."

"Seedlings and seeds must be organic certified by la Xarxeta or CCPAE or DEMETER. If organic seeds or seedlings are not found the network must find some farmer to prepare seedlings."

Water Management (La Xarxeta, 2016l)

"*Farmers must endure a good water quality. Water from water treatment plants, greywaters or black waters."*

"When risk of water contamination is detected farmer must perform analysis which must be accompanied by a set of actions and corrective measures."

Pests and Diseases (La Xarxeta, 2016m)

"*Pest management must be based in preventive mechanisms. Synthetic chemical pesticides are forbidden. Farmers must know crop management practices of their neighbors and act to reduce contamination risk."*

"Cupper use must be reduced."

"Active natural compounds accepted by the normative 834/2007 which are general and aggressive must be used with caution."

"Farmers must avoid to buy phytosanitaries to big agribusiness companies."

Weed management (La Xarxeta, 2016n)

"*Weed management must be based in physical methods (manually, mechanical or mulching) and cultural methods (false seeding, dense seeding, polyculture, green manure, rotations, etc.)"*

"Synthetic chemicals for weed management are not allowed."

"Mulching must prioritize internal material as straw, crushed trimmings, etc.) When external mulching material is used, it must me biodegradable."

Harvest and Storage (La Xarxeta, 2016o)

"*Time between harvest and consumption must be the shortest possible for products consumed fresh*"

Waste (La Xarxeta, 2016p)

"*Crop residues should be composted or use as feed. When is not possible should be crushed and incorporated to the soil. Burning crop residues or moving them out of the farm must be avoided. Inorganic residues must be managed properly*."

Machinery (La Xarxeta, 2016q)

"*Machinery dependency must be reduced. Machinery must be kept in good condition*."

Social and Economic criteria

Production (La Xarxeta, 2016r)

"*Production must be 100% organic.*"

Marketing and Distribution (La Xarxeta, 2016s)

"Farms should commercialize 100% organic fresh products. The criteria about elaborated products depend on farmers. 75% of the production should go from farmers to final consumers or another producer or farmer network."

"Farmers should try to commercialize their products in the same area where they produce."

"Farmers should enhance the participation of consumers and motivate they inclusion in the decision-making process."

"Farmers should maintain transparent information with consumers and other members of the network." "More than 50% of the product commercialized must be produced by members of the network."

"All product commercialized in the network must be seasonal."

Organization, Legal Regime and Labour Situation (La Xarxeta, 2016t)

"*Between the farmer and the worker must exist a binding contract, not including sporadic collaborations."*

"Workers must perceive at least the salary accorded in the collective agreement of the agricultural sector."

"It is not accepted any kind of discrimination by gender, origin or other personal conditions."

Outreach (La Xarxeta, 2016u)

"*People involved in the network should be comfortable getting involved in movements related with agroecology and food sovereignty*."

Rigour

The stakeholders involved are farmers. Therefore, they understand the objectives of the system and have an expertise level and first-hand experience. All farmers have agricultural studies and most farms have a member with superior studies (Interviews with farmers).

The PGS follows **a participatory certification**. It is structured in a decentralized system. Most decision-making and knowledge exchange is in the local node level. In addition, local node assemblies are in charge to receive, guide and audit new participants in the PGS (La Xarxeta, 2016d). However, important decisions which affect the whole network are taken in a general assembly by consensus. There are two **mandatory assemblies** per year (La Xarxeta, 2016e; Interview with PGS committee member, 2016). The network has other functions beyond the PGS. Therefore, the organizational structure is complemented with two other organs. First, the control and coordination commission, composed by a delegate of each node, is in charge to prepare General assemblies and control the compliance with the agreements (La Xarxeta, 2016f). Second, working committees in formation, PGS, marketing and socialization (La Xarxeta, 2016d).

The auditors of the PGS are other farmers in the same network. Therefore, when farmers are accepted as a full right member[18] they must develop inspections to members of the network. Farmers inside the PGS share similar characteristics (size, production, motivations, etc.) which allows for expertise knowledge. However, new members at first accompany an already experienced member during the visits (interview with a PGS committee member). Therefore, the different members of the PGS receive a **peer-audit** composed for a pair of members one from the same node and another from an external node (**audit team**) of the member audited.

The audits are based in **three documents**. Before going to the visit, auditors must read the 'visit protocol'[16] and the section in the register that explain the rationale on how to calculate the indicators and the ideology behind them. During the visit, the audit team evaluates the farm according to an 'evaluation file'[19] and corroborate that what has been written in the farm register is followed (Interview with a PGS committee member). Therefore, the register contains

[18] A productive project becomes a full right member of the network when all requirements are fulfilled after a 6 months' adaptation period and passed the audit. [16] Not available for consultation.

[19] The evaluation file comprises the indicators and its benchmarking. The evaluation files are not available for consultation for members outside of the network.

on the one hand, general application information and on the other hand, information of the productive project being audited. The register must be updated in consonance to the modifications of the productive project (Interview with PGS committee member, 2016). The audit aims to a holistic assessment, with some minimums (rank1) and later by assessing "*the global coherence of the productive project considering particular situations*" (Moya, 2009; Interview with a PGS committee member, 2016).

Engagement

Participation is at the core of the network and therefore the PGS (Interview with a PGS committee member, 2016). All important decisions are brought to **the assembly** which is open to all members of the PGS and all members receive information from all local node assemblies (La Xarxeta, 2016i). **Audit visits** are **open** to members of the network as observers. The evaluations of those audits are discussed in an assembly the next meeting after the visit or audit. When it is a new incorporation to the PGS the **discussion** about its incorporation will be conducted without the presence of the members being analyzed. When it is a revision audit the presence of the member is required (Interview with a PGS committee member). "The **performance of auditors is discussed in assembly**" (Interview with a PGS committee member, 2016).

In addition, "*Network's members which are not part of the PGS committee may propose new standards to be calculated*." (ibid)

Impartiality

During interviews with former members the idea that not everyone is assessed in the same way was reason of friction due to the **inexistence of protocols** and in some cases to abandon the PGS and therefore the network (Interviews with a former PGS members). However, the assembly is the place where all those frictions must be transmitted and through **dialogue achieve consensus** to mitigate the cause of friction (La Xarxeta, 2016v).

Transparency

The main channel to provide information of the standard system to 'outsiders' is through **internet.** The information about the structure of the governance body is available on the network webpage. The chain of authority and objectives is clear and stated (La Xarxeta, 2016e; 2016f; 2016h). In reference to the standard content, the indicators used are not freely available for the general public. However, the general norms on which they are sustained are specified (explained in Relevance section) (La Xarxeta, 2016b). Furthermore, financial resources of the governance body are not available for the general public, nevertheless, the PGS is run in **volunteer work** (Interview with the PGS committee).

The internal transparency is managed through email. All members of the network receive meetings proceedings and decisions from the general assembly, local node assemblies and working committees (La Xarxeta, 2016i)

The **list of all members of the PGS** is available with direct links to their own webpages (La Xarxeta, 2016b)

Accessibility

"***Fees*** *are paid to be part of the network. The amount varies annually in consonance to the number of people in the network and digital services provided by the network. If you have your own website the annual fee is 120 euros and 150 euros with website*" (Interview with a PGS committee member).

The **process of accepting new members** in the network is based in 7 steps: 1) a "certification file" is given to the new experiences to gain knowledge about technical, social and economic features of their projects. 2) When the file is filled in and submitted, the audit team visits the farm using the "evaluation templates", which contain the indicators. 3) The audit team assesses the project and **propose improvements** 4) The documents are sent to the PGS committee. 5) The PGS committee propose a final evaluation and improvement proposals to the assembly[20]. 6) The assembly reach consensus about the final evaluation and the improvement proposals. 7) When accepted the new experience is incorporated to the node functioning and to the network (La Xarxeta, 2016e) Truthfulness

The PGS has **no claims** done about their certifications and the qualities added to their products. It is not use as a marketing strategy and is not reporting any premium prices. It just serves for producers inside the network to verify the other producers still maintain the agreement. However, being part of la Xarxeta can be used as a marketing mechanism (Interview with a PGS committee member, 2016)

Efficiency

"*The* ***PGS committee*** *is in charge to revise the functioning and efficiency of the PGS, evaluate the visit through the presence of one of the members of the PGS committee, evaluate farm's reports and the rhythm of visits"* (Interview with a PGS committee member, 2016)

"*The main risk of the PGS is the tiredness of the members according to the dedication time. Furthermore, the invisibility of the PGS provokes that members do not consider important to put time and effort to the PGS. Currently there is no economic premium because consumers are not as interested in our product as we thought*" (ibid)

The PGS members maintain relation with other organizations. Nevertheless, there is **no collaboration with other certification schemes** (Interview with a PGS committee member, 2016).

6.2. Sustainability Assessments

The sustainability assessments section presents: First, results from farms of each certification group are presented by dimensions and themes. Second, results from each certification group are compared by dimensions and themes. Themes starting with G correspond to Good Governance dimension, E correspond to Environmental Integrity dimension, C correspond to Economic Resilience and S correspond to Social Well-being.

6.2.1. CCPAE Farms

[20] The proposal of improvements is in process of being modified and audit teams will be the only ones to propose improvements.

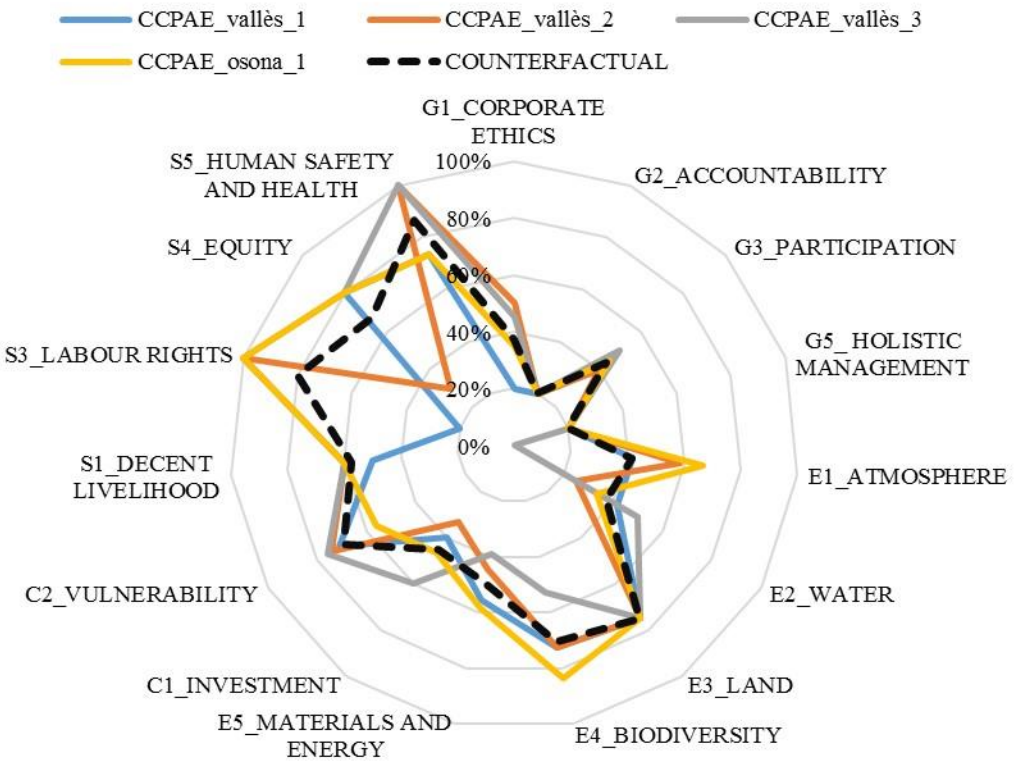


Figure 6. SAFA sustainability assessment of CCPAE farms

Good Governance dimension

In the governance dimension, farms performed very similar with low variability and low scores of sustainability. The themes Corporate Ethics and Participation achieve good sustainability scores with farms reaching a 50% of achievement. However, on the one hand Corporate Ethics shows more variability with the worst performing farm being stuck in unacceptable sustainability scores of 20% of achievement. The counterfactual result of Corporate Ethics is limited sustainability (38%). On the other hand, Participation sustainability scores are more consistent and the lowest scores are limited (40%). The counterfactual result for Participation is moderate sustainability (44%). All the farms in the Accountability and Holistic Management themes scored unacceptably (20%) being this score the counterfactual score.

Environmental Integrity dimension

In the environmental dimension, results show variability among farms in the different themes. The theme with higher collective sustainability scores is Land with all farms good scores (75%), being this the counterfactual score. The Biodiversity theme range from a farm with moderate results (slightly passing 50%) to another farm with best results (slightly passing 80%) with a good counterfactual result of 70%. Materials and Energy scores range from limited (39%) to moderate (58%) with a moderate counterfactual score of 49%. The themes Atmosphere and Water show the worst performance. The Atmosphere theme presents the highest variability ranging from unacceptable (0%) in one farm to scores between moderate (42%) and good (67%) for the rest with 42% (moderate) being the counterfactual score. The Water theme

presents the lowest results of all environmental dimension and range from limited (25%) to moderate (50%) with a counterfactual limited score of 38%.

Economic Resilience dimension

In the economic dimension, farms present similar patterns with higher results in the theme Vulnerability than in Investment. Furthermore, the scores in Vulnerability theme present a higher consistency with results ranging from moderate (56%) to good (76%) with a counterfactual score of 69% (good). The scores in Investment theme range from limited (33%) to moderate (60%) with a counterfactual score of 45% (moderate). Social well-being dimension

In the social dimension, farms present high score variability. The themes with higher variability are Labour Rights and Equity. The Labour Rights scores range from unacceptable (20%) in one farm to best (100%) in the rest of the farms with a counterfactual score of 80% (good). The Equity theme scores range from limited (30%) in one farm to good (80%) in the rest with a counterfactual score of 68% (good). Decent Livelihood and Human Safety and Health present more stable results. Decent livelihood scores are moderate (from 50% to 60%) with a counterfactual score of 58% (moderate). Human Safety and Health scores range from good (73%) in two farms to best (100%) in the other two with an counterfactual result of 87% (best).

6.2.2. PGS farms

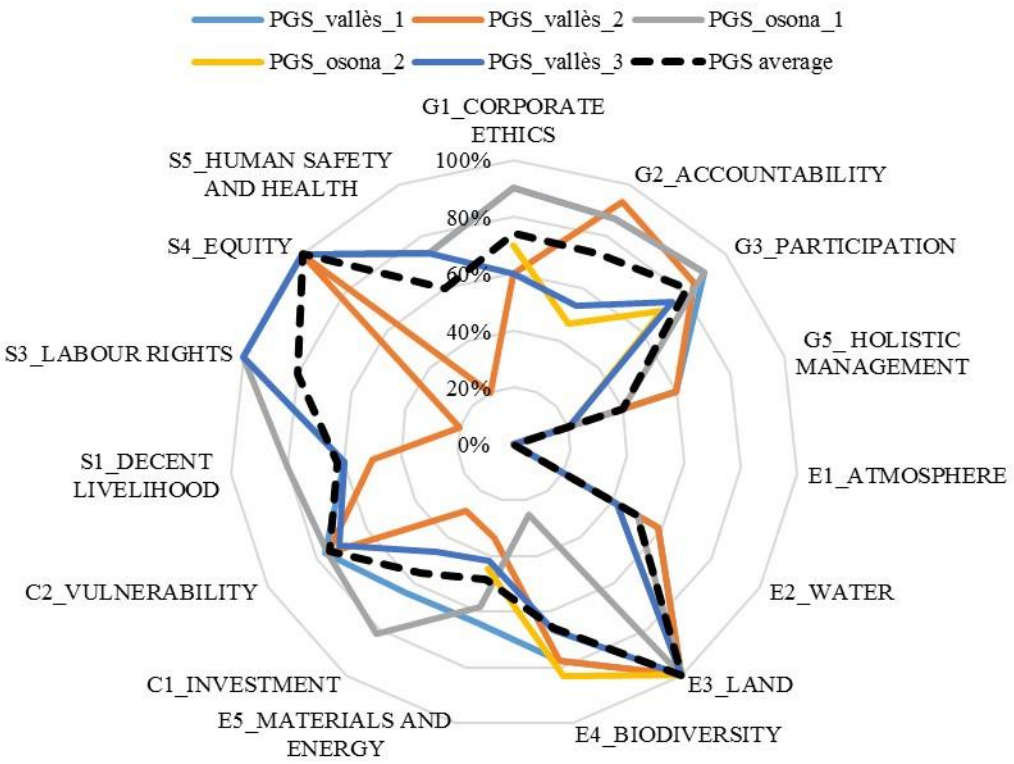


Figure 7. SAFA sustainability assessment of PGS farms Good

Governance dimension

In the governance dimension, farms present high results of achievement with certain degree of variability depending on the theme. The theme with lower variability and higher sustainability scores is Participation with scores ranging from good (70%) to best (90%) with an average of 82% (best). Corporate Ethics and Accountability present a similar situation but Accountability present more variability on the results. On the one hand, Corporate Ethics scores range from moderate (60%) to best (90%) with an average score of 74% (good). On the other hand, Accountability scores range from moderate (47%) to best (93%) with an average score of 73% (good). Holistic Management theme presents the lowest sustainability performance results of governance dimension themes with scores ranging from unacceptable (20%) to moderate (60%) with an average of 40% (limited).

Environmental Integrity dimension

In the environmental dimension, farms present similar patterns. For the themes Atmosphere and Land all farms performed identical. However, in opposite sides of the spectrum. On one side, all farms scores are unacceptable (0%) which is the average score in Atmosphere. Obviously is the worst performing theme. On the other side, all farms performed best (100%) in Land representing this score the average and represents one of the best performing themes. The next theme with less variability is Water with moderate scores (ranging from 42% to 58%) with an average score of 50% (moderate). Materials and Energy presents a range of scores from limited (33%) to good (64%). The average score for Materials and Energy theme is 48%

(moderate). The theme which present the highest variability is Biodiversity with scores ranging from limited (25%) in one farm to good and best scores (between 67% and 83%) for the rest and an average result of 66% (good).

Economic Resilience dimension

In the economic dimension, farms present similar patterns with the majority performing better in Vulnerability than in Investment. The scores in Vulnerability are more good (ranging from 71% to 77%) and an average result of 75% (good). The scores in Investment present more variability and range from limited (29%) to best (82%) with all farms scores being separated 20% to the next one. The average score in Investment is 56% (moderate).

Social Well-being dimension

In the social dimension, farms present similar patterns in exception of one farm. The theme which presents the higher scores is Equity with all farms scoring best (100%) being this score the average for the theme and together with Land in the environmental dimension are the best performing themes. Labour Rights present all farms scoring best (100%) in exception of one farm scoring unacceptable (20%). The average for Labour Rights theme is 80% (good). The theme Human Safety and Health is in a similar situation than Labour Rights. All farms score good (73%) except one farm which scores unacceptable (20%). The average score for the theme is 60% (moderate). The Decent Livelihood theme presents a score range from moderate (50%) to good (80%) being 63% (good) the average score.

6.2.3. Counterfactual vs PGS average

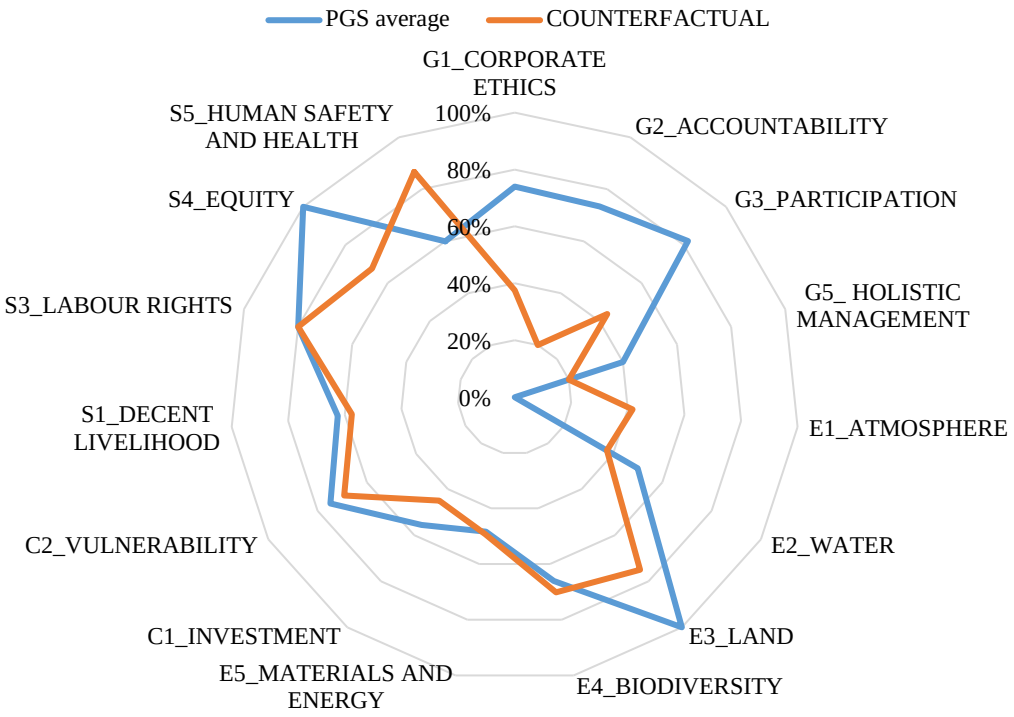


Figure 8. Aggregated SAFA sustainability assessments results of the PGS and CCPAE Good Governance Dimension

The good governance dimension presents the most significant differences. All the farms in the PGS outperform the farms holding just the CCPAE certification. Among all the themes the one presenting less difference and worst results is Holistic Management (40% vs 20%). Corporate Ethics (72% vs 38%), Accountability (73% vs 20%) and Participation (82% vs 44%) average scores show clear differences among the farms. Furthermore, it is important to note that farms in the PGS present more variability in their results than CCPAE farms. Environmental Integrity Dimension

In the environmental dimension, farms in the PGS perform similar than CCPAE farms. On the one hand, PGS farms outperform CCPAE farms in Water (50% vs 38%), Land (100% vs 75%), and Materials and Energy (71% vs 68%). However, there is no significant differences. On the other hand, CCPAE farms outperform PGS farms in Atmosphere (0% vs 42%) and Biodiversity (66% vs 70%). In this dimension PGS farms present less variability in Atmosphere and Water and CCPAE farms in Biodiversity and Materials and Energy.

Economic Resilience Dimension

In the economic dimension, average results between PGS farms and CCPAE farms are very similar, however PGS farms scores are slightly higher in Investment (56% vs 45%) and Vulnerability (75 vs 65%). It is important to note that PGS farms present high variability in Investment but perform almost the same in Vulnerability.

Social Well-being Dimension

In the social dimension, average results between PGS farms and CCPAE farms are similar for Decent Livelihood (63 vs 58%) and equal for Labour Rights (80% vs 80%). However, PGS farms outperform CCPAE farms in Equity (100% vs 68%) and CCPAE farms outperform PGS farms in Human Safety and Health (60% vs 87%). However, farms in both schemes present high variability being farms in CCPAE more variable.

6.3.Farmers Perceptions about Certifications

The following section presents perceptions of the effects on on-farm sustainability and the supports received from the certifications which they belong. Therefore, on the one hand, PGS farmers express their perceptions on the PGS and the CCPAE. In the other hand, CCPAE farmers express their perceptions on the CCPAE certification.

6.3.1. PGS farmers´ perceptions

Perceptions on the CCPAE certification

The range of perceptions of PGS farmers about the effect on on-farm sustainability of CCPAE certification and the supports farms receive from it vary in their approach. Some farmers had a more positive approach while others were focused directly in negative aspects. All farmers were prompt to criticise the certification and to emphasize the low effects it has in their enterprise sustainability. However, farmers also stated the certification capacity to open the door to new marketing channels.

The low effect on their sustainability seems to reside on the fact that all farmers used to cultivate in the same way before being certified because there was no reconversion period. Therefore, no changes were done.

> *"The CCPAE is based in an annual control of the compliance with the European legislation. There is no agroecological implications and in consequence, the effect to our farm sustainability is very little. It affects economically because we must pay the stamp. We have produced always the same way, before and after being certified".*
>
> (PGS_osona_1)

> *"There is no effect. We have the certifications because we feel forced to. The foundations of our project have been always the same and in line with the certification."*
> (PGS_vallès_2)

> *"It does not contribute to the sustainability of my farm. It is an imposition because is the only certification body. Schools demand the certification. However, box consumers know me and they can come to the garden whenever they want. Also, restaurants do not care if it is organic or not, they just want a good product. Therefore, CCPAE gives more problems of inspections and documents than the economic benefits."*

(PGS_vallès_3)

"CCPAE affects in that there is no pollution by phytosanitary products or chemical fertilisers."

(PGS_vallès_1)

"We enter to the certification because we needed a guarantee toward consumers. […] Nowadays, it gives us a guarantee towards other producers and consumers but it is not fully necessary. It starts to become a burden. [Although] it helps to keep you on track. For example, you will not buy treated seeds, it helps to maintain the standards."

(PGS_osona_2)

Farmers stressed the idea of economic and bureaucratic burdens as the main negative aspects. Mostly related with the opportunity cost of the time spent in filling forms instead of being working in other aspects. Furthermore, the close relation with their costumers makes them perceive that there is no benefit on having the label.

"There is no support from the certification, rather obstacles. It is money you must pay, a lot of bureaucracy and there is no advisory. If you have a technical problem, you get a sanction proceeding."

(PGS_vallès_1)

"The thing which disappoints me is that we are dealing more and more with paperwork and less in the field. […] Seems they just have interest in bureaucracy…

… I feel that they are becoming less interested in crops and more in bureaucracy. We do not need the certification for our clients…

… The system they use is designed more towards monoculture than diversification and therefore it is difficult to fill up forms if you have crop diversification or if you do direct sales."

(PGS_osona_2)

Even if farmers consider that their clients know them and that they do not need the certification for direct sales and short marketing channels go beyond direct sales. In consequence, the only mentioned benefit of the certification is that its stamp open new marketing channels.

"We understand that the CCPAE can support us in selling to restaurants or schools because all kind of institutions ask for the stamp. We are not using it on that way but we know it will open this door."

(PGS_osona_1)

"The stamp helps you to commercialize your product. It does not help with box scheme clients because we are transparent and they know it. However, to sell to schools it is necessary. The certification is interesting to find less direct marketing channels."

(PGS_vallès_2)

The CCPAE certification it is perceived as having low sustainability impact on farms because it is too narrow in its scope. Furthermore, it is perceived as being too much bureaucratic and dispensable for direct marketing channels but useful when looking for less direct marketing channels.

Perceptions on the PGS certification

The perceptions about the PGS certification are very similar among farmers. Nevertheless, its effects on farms' sustainability are not stated clearly. Farmers have stated ideas about the implications of being part of the PGS but not direct effects. However, the approach to it focuses in positive aspects and seem that farmers define PGS by comparing it with the official certification.

> *"The PGS is more restrictive. Sometimes we would like to do some things but we cannot because of the certifications and others that we will not do them but the PGS obligate you. There are some things we will like to do but we do not have time."*
>
> (PGS_vallès_2)

> *"The PGS is more complete than the CCPAE. We have tried to drive it in a way and has finished in another way, as a stamp. However, SPG is closer to my convictions. Nevertheless, the PGS is still in an embryonic phase. I suppose that on the long run it will be very positive."*
>
> (PGS_vallès_3)

> *"The PGS includes the things that the CCPAE demands and add social objectives like a proper labour situation for workers or just the acceptance of short marketing channels reducing GHG emissions and just seasonal products are allowed. […] Furthermore, there is a promotion of raising consumer consciousness, eating healthy, keeping the territory with a non-polluting agriculture and working for a minimum of food security*."
>
> (PGS_vallès_1)

> *"The PGS have more implications on sustainability and there are some benefits about getting to know and socialize with other projects. Furthermore, there is some diffusion, because at the [official] political level there is no movement to boost the sector. Therefore, together we try to give more strength. […] However, we can be outside the [CCPAE] certification and outside the PGS and our project will continue the same."*
>
> (PGS_osona_1)

Farmers consider that being able to meet other farmers is the biggest support they receive from the certification. In addition, this socialization seems to allow the collective learning thanks to the structure built around the PGS.

> *"The other members of La Xarxeta explain the evaluation of your farms. Furthermore, the inspections help to realize the shared problems we face and courses are developed to give solutions to those problems."*
>
> (PGS_vallès_2)

"We receive support between companions of self-control and regulation. Furthermore, it dignifies our job. […] We also exchange ideas; you give value to your job and you want to be more strict and serious."

(PGS_vallès_3)

"The PGS is not just a guarantee system, it is also a collective assessment system where some improvement proposals are done to try to improve your situation. Furthermore, by collecting weak points of everyone we elaborate lists with formation proposals to overcome those weak points."

(PGS_vallès_1)

Therefore, farmers do not perceive any sustainability impacts from the PGS to the farms. However, the PGS have structures built around it which for the moment provide the benefits and the support needed to achieve higher levels of sustainability. At the moment, it seems that the PGS situation is allowing farmers to evolve towards sustainability outcomes which are not perceptible yet.

"The participative certification allows you to participate of other projects that work similar than you work and allows us to evolve collectively."

(PGS_osona_1)

"The CCPAE tells you what to do and the PGS tells you what you should achieve. [The PGS] is more holistic and it is better in this sense, but it is not restrictive about being expelled if you do not comply"

(PGS_vallès_2)

The PGS is perceived as an evolving certification which includes more aspects and dimensions than the CCPAE. Furthermore, it provides a platform for knowledge exchange which allows collective learning.

6.3.2. CCPAE farmers' perceptions

The perceptions about the certification and its impacts on sustainability and the supports received draw two different groups of perspectives: indifferent and critical.

Indifferent perceptions do not judge the certification and just explain the requirements.

"The CCPAE gives you sustainability criteria and I try to follow them."

(CCPAE_vallès_3)

"CCPAE controls a lot the traceability about seeds and seedlings, fertiliser, etc. But is not a certification which controls you a lot. Basically, cupper, fertilisation, traceability, invoices, etc."

(CCPAE_vallès_2)

It seems that ‘indifferent farmers’ do not perceive any certification´s sustainability impact. On the contrary, a ‘critical farmer’ perceives the certification as something negative.

> *“It limits my farm sustainability like all certifications. […] If you have a more complete certification like a Demeter why do you need the organic certification [CCPAE]? They just want you to do the certification because then you get some money and then they can get some [money] for them.”*
>
> (CCPAE_osona_1)

The negative perception seems driven by the lack of complementarity between certifications and arbitrary standards.

When focusing on supports received from the certification, CCPAE farmers’ perspectives coincide with PGS farmers’ perspectives. The stamp of the organic certification opens marketing channels.

> *“The CCPAE allows me to commercialize to schools. Schools always ask for the certificate. […] We receive some money to produce organic and it gives trust to people when they buy from you.”*
>
> (CCPAE_vallès_1)

> *“When I have some question, they give me an answer. Helps me to differentiate to the others that produce organic but are not certified.”*
>
> (CCPAE_vallès_3)

> *“We did not want to have the CCPAE. However, we are expanding and the stamp opens new marketing channels where trust is not enough. Furthermore, CCPAE helps to solve administrative problems with the certification.”*
>
> (CCPAE_vallès_2)

> *“The certification allows me to sell vegetables to people that do not know me and until they do not know me. I will not need the stamp with people who knows me but there is a lot of people that if they do not see the stamp and do not know me they will not buy from me.”*
>
> (CCPAE_osona_1)

The CCPAE is perceived as necessary when selling organic products to provide benefits to commercialize products when the relation consumer-producer is not close.

7. DISCUSSION

This chapter presents the analysis of results, limitations and further research and recommendations for practical implementation.

7.1. Analysis of results

This section is structured by first, discussing the differences between certifications, second, analysing the results of SAFA sustainability assessments within farms of the same certification and third, analysing the main differences between the counterfactual and the PGS average caused by the PGS certification impact.

7.1.1. Certification differences

The explanation on main differences is based on a summarizing table (table 6) of ISEAL credibility principles (ISEAL, 2013). This differences are contextualized with the available literature and farmers' perspectives.

Table 6. Main differences between ISEAL credibility principles of the European Organic certification and the 'La Xarxeta' PGS

	CCPAE	PGS
SUSTAINABILITY		
Objectives:	organic agriculture→ product quality, environmental protection & consumer demand council	Agroecology→ Farming practices, social, economic and cultural transformation.
Structure:	regulation→ European	Participatory→
standard owner:	Commission	Farmer network.
authority:	Ministry of Agriculture	Farmer Network
control body:	CCPAE	Farmer Network
Object certified:	Products	Productive Project (farms)
Control:	Accreditation→In-situ audits → certificate and label	In-situ audits→ no certificate or label
Conformity:	Compliance and noncompliance	Compliance and noncompliance Continuous improvement and collective learning
Sanction regime:	3 sanction levels	No sanctions
IMPROVEMENT		
Integrated learning:	EU policy → scientific trends CCPAE→ statistics, information exchange. Assurance system→ audits, continuous revision and resolutions with operators and analysis on samples.	PGS committee→ analysis of farm audits & farm improvement proposals. Formation Committee→ training courses Assurance System→ continuous revision by PGS committee and no analysis on samples.
Strategy setting:	CCPAE→ Junta Rectora	All ratified in assembly

RELEVANCE	Technical directives and products: Crop material, Crop management, Crop protection, Weed management, Soil management, Pest management, Storage facilities.	Technical directives, social and economic criteria: Crop material, Crop management, Crop protection, Weed management, Soil management, Pest and diseases management, Harvest and storage, Water management, Machinery, Production, Marketing and distribution, Organization, legal regime and labour situation, Outreach.
RIGOUR		
Standard setting:	EU legislative process	Farmer participatory process
Control process:		
Farm audits:	Third party audits	peer audits
Periodicity:	Annually	Biennial (approx.)
Auditors preparation:	Supervision, formation and certification of auditors	Supervision and formation of auditors
Documentation:		
Assurance system:	Record keeping	Record keeping
Auditors:	Methodology for farm assessment and guiding documentation	Methodology for farm assessment and guiding documentation
Auditee:	Field notebook and invoices	Farm register
ENGAGEMENT		
Standard development:	EU→ advisory group & public consultation	Consensus democracy
Governance:	CCPAE→ 4 years' election for 'Junta Rectora' (governing body) includes consumers	Consensus democracy not including consumers
Assurance, monitoring and Evaluation:	Farmers can fill a form on the CCPAE website	Open audits for members, discussion about evaluations and auditors' performance
Complaints resolution:	Procedure for complaints and dispute resolution	Open dialogue (Assembly)
IMPARTIALITY		
Regional:	'comitè de parts' → UNE-ISO/IEC 1706 Annual report from CCPAE	No protocol→ EN Stakeholder dialogue

	Technical director	
TRANSPARENCY		
Website:	EU→policy development, stakeholders, governance bodies and EC departments Ministry of Agriculture→ normative and reference work CCPAE→ modification of standards, structure assurance body and legislation. CCPAE→ list of clients not auditors and stakeholder input Fees and others	Farmer network→ structure, organization, decision making, objectives and directives. Process of evaluation and who is evaluated. List of clients (not updated)
Financial:		Volunteering work
ACCESSIBILITY		
costs:	Fees to be certified	Fees to be certified
acceptance:	Methodology of acceptance and adaptation period	Methodology of acceptance and adaptation period.
advisory:	No advisory from control body but proposition of advisory services	Advisory on farm sustainability improvement
TRUTHFULNESS		
Claims:	Respect for nature, produced in a sustainable way, control once a year, respect organic, health and consumer health rules, most use of local resources and local knowledge.	No claims
EFFICIENCY		
Rules followed:	ISO rules, codex alimentarius PGS rules and Organic legislation	
Collaboration:	ENAC, other Spanish regions and other countries to facilitate trade and INTERECO. No collaboration with other certifications in Catalonia	No collaboration with other certification schemes certifications

The contextualization of sustainability, according to ISEAL credibility principles, presents several differences between both certifications. One of the most important differences which may affect all the other aspects of sustainability are the two different structures or power relations (Radomski and Leal, 2015) followed. On the one hand, CCPAE certification follows a top-down approach (May, 2008), were first European and then regional level (Catalonia) decide which techniques and products farmers must apply which represents an example of the

centrality of third-party certification (Nelson et al, 2015). On the other hand, the participatory structure of the PGS have been created following a bottom-up approach and a participatory process (Moya, 2009), were farmers have decided which concepts they found interesting to consider in the certification and what standards and norms use to control it, giving the ownership of the certification to them. This has created one of the key elements of a PGS: a shared or common vision among PGS farmers (IFOAM,2014). This common vision has considered 'relevant' to include to the technical directives, social and economic criteria to standards and norms.

The consideration of what it is sustainability in both cases is different. CCPAE considers sustainability focusing on a product obtained following organic agriculture practices while the PGS considers the sustainability of a productive project (farm) as a unit for sustainability calculation in consonance to other PGS (May, 2008; Cuéllar, 2008) and therefore provides a better basis to advance towards sustainable development because it is grounded on the sustainability of agroecosystems (Gliessman, 2007). Furthermore, even if both certifications do farm audits, the PGS does not issue a certification or represent it with a label, it is the social process which guarantees the product and not the certificate (De la Cruz, 2016) and introduce continuous improvement and collective learning to the conformity procedure beyond compliance and non-compliance, putting importance on the process of learning (IFOAM, 2014) which in La Xarxeta PGS has become the most important benefit perceived by farmers. Furthermore, PGS does not contemplate sanctions or consequences for non-compliance missing one of the key features of a PGS as IFOAM (2014) states but that makes La Xarxeta PGS a clear example of a PGS constructed with solid principles and flexible rules (Torremocha, 2012). Nevertheless, this may facilitate situations of free-riding IFOAM (2014) to have access to exchange products. Free-riding facilitates single farms adaptation to the organic Catalan agrifood system but in reduces the transformation potential of the PGS.

The way certifications seek this transformation (improvement) present differences. CCPAE certification base standards changing in scientific trends and context adaptability, when the situation change, change policies to change practices. Furthermore, the revision of the assurance system is based in audits, revisions of operators' resolutions and analysis on samples. La Xarxeta PGS puts the central focus in farmers. It bases their improvement on farmers' proposals and develop training courses to improve the sustainability situation of farms. The assurance system is also continuously revised after a round of audits, change practices to change policies. Strategy setting in certifications concerns the governance body, in the CCPAE few people decides and in the PGS the assembly of all members after discussions in the local nodes decides, being an example of a horizontal and decentralized system versus a vertical and centralized system.

The differences in 'rigour' of the control process are affected by the top-down and bottom up approaches. Those differences are the most well-known differences. Third-party certification represents a hierarchical system while La Xarxeta PGS is based in horizontality (IFOAM, 2014). Audits are performed by professional auditors in CCPAE as all third-party certifications. Nevertheless, farmers in the PGS could be also considered experts due to the strong farmer education. Documentation required is similar in both cases, CCPAE as a third-party certification provides a high degree of accountability (Nelson et al, 2015) but it becomes one of the weak points of PGS because some operating procedures remain informal, unclear, inconsistently applied (Nelson et al, 2015; IFOAM, 2014) or documentation is scarce (De la

Cruz, 2016) as consequences for non-compliance or impartiality protocols in La Xarxeta concretely. At the end, the certifications are built from different risk and trust approaches, "*Risk taking and risk aversion, shared confidence and shared fears, are part of the dialogue on how best to organize social relations*" (Douglas and Wildavsky, 1982 in Radomski and Leal, 2015) and while CCPAE, according to farmers' perspectives, 'criminalize' the farmer, PGS create shared trust.

The 'engagement' of stakeholders in standard development seems reduced in the CCPAE certification and farmers state that the option received from the certification to participate is just in the election of the 'Junta rectora' each 4 year while in the PGS all decision making is based in consensus democracy representing another important key element of PGS, participation (IFOAM, 2014). Nevertheless, in the CCPAE consumers are represented and in the PGS are not still represented but according to Nelson et al, (2015) this engagement in the administrative level may eclipse distrust and disengagement between producers and consumers in everyday interaction because third-party certification assumes long distances between consumers and producers (Boza, 2013). The CCPAE has a procedure for complaints and dispute resolution, PGS relies on the assembly to solve disputes.

The La Xarxeta PGS presents problems of 'impartiality' because there are no protocols and conflict resolution is led to stakeholder dialogue which seems to rest legitimacy to the certification according to former members. CCPAE follows ISO rules which seems to offers a high degree of objectivity (Nelson et al, 2015). For De la Cruz (2016) "*are these legislativetechnocratic rules which confer control bodies and auditors, supposedly, the capacity to be a neutral referee or judge to consider what it is organic and what is not*". However, the rules of the "game" are set far from producers and consumers and with possibly a high influence of corporate lobbing.

Certifications deal with transparency requirements using their respective websites. However, in the case of the PGS all stakeholders involved have knowledge about working and decision making processes in all bodies (local nodes, committees and general assembly) representing another key element of PGS (IFOAM, 2014). Therefore, the website has just and external informative character as a difference in the CCPAE which is one of the ways how stakeholders are informed.

Both certifications require a fee to have access to the certification but prices differ. It is cheaper to be part of the La Xarxeta PGS however it also requires volunteer work as many other PGS which may imply time constraints (Nelson et al, 2015) when time is needed for a proper functioning (De la Cruz, 2016). But this volunteer work is "rewarded" with advisory about farm sustainability. The CCPAE have higher fees with no advisory on what Nelson et al, (2015) describes as the divorce between extension assistance and certification typical of third-party certifications. In our study, be part of the PGS does not suppose reducing costs of certification because farmers still part of the CCPAE certification to have better market access. However, fees for product covered is perceived for farmers as a comparative disadvantage for crop diversified farmers in comparison to monocrop, reducing the accessibility for farmers practicing agroecology.

The PGS does not do claims and therefore it is not widespread to consumers, just farmers are part of the PGS for the moment and therefore, they do not need claims because all of them

know each other. The CCPAE certification does claims. In most of the cases, targeting consumers which showing its tendency to become a marketing strategy to reach the organic consumer (Radomski and Leal, 2015) niche which are consumers concerned with their health more than in environment. PGS presents a producer based approach.

The collaboration with certifications working in Catalonia is inexistent. Nevertheless, outside of Catalonia CCPAE collaborations are based to facilitate trade which correspond to what Nelson et al. (2015) consider a main feature of third party certifications, the promotion of highly market-oriented vision in organics. This differentiate it from the PGS because a key PGS´s feature (IFOAM, 2014; De la Cruz, 2016) it is its focus in serving the local market and in direct relation with consumers. However, it will be interesting if farmers through the PGS can get involved with other participatory certifications to learn and therefore enhance their own functioning.

7.1.2. Farms sustainability assessments

This section analyses results from farms within the same certification by collecting the most important aspects collected by SAFA to explain the reasons of sustainability scores in each theme. First farms in the CCPAE are presented followed by farms in the La Xarxeta PGS.

CCPAE farms Good Governance dimension

The variability and scores on **Corporate Ethics** can be explained by three main points. The first point is the variability on considering sustainability in their mission, two farms consider some aspects of sustainability (environmental and social) while others do not consider any aspect. A common point about the farms' missions is to produce good food. The second point is that just one farm could explain how the mission stated influences the work which they do (organic farming, short marketing channels and seasonality). The third point, is the general low proactivity about risk management with some farms not being able to explain any kind of policy or informal protocol followed to assess their effects on sustainability.

The low score on **Accountability** can be explained by the general lack of holistic audits in the farms, the general lack of evaluation of farm sustainability beyond economic sustainability or viability and the lack of information disclosure. Just one of the farms is using social networks to communicate crop management.

The **Participation** theme results' consistency seems to have clear explanation. Farm managers identified stakeholders based in product and money exchange. Accordingly, workers and consumers were identified in almost all cases. Therefore, farmers identified less than half of stakeholders in most cases but engage appropriately with a good number of the recognised stakeholders through direct dialogue during "exchange" time. In any case stakeholder engagement barriers were identified. Stakeholders feedback is collected in topics of product planted and product quality. In conclusion, farms seem to consider product as the only nexus and direct dialogue as enough for an effective participation of stakeholders and act consequently to it.

Even if all farms performed poorly in **Holistic Management** there is two groups of farms. On the one hand, farms with no written sustainability plan, incapable of articulate sustainability objectives and values and not contemplating any impact of their actions, one of them not even economic. On the other hand, farms with no written sustainability plan but capable to articulate sustainability objectives in some dimension, mostly economic and contemplating their impact in economic dimension. To conclude, farms does not collect information on sustainability performance.

Environmental Integrity Dimension

Atmosphere theme low scores can be explained by the inexistence of plans and targets in reducing Greenhouse Gas (GHG) emissions and Air Pollution in any farm. The theme variability is related to different application of practices in each farm. One farm presents high application levels and another application of unacceptable practices. However, common practices applied in all farms define organic farms, where polyculture is used, the presence of perennial plants enhanced and manure application optimized and complemented with the use of vegetation residues. All farms use soil or stone bunds and most of fields are kept with a dense soil coverage all year-round. Additionally, in all cases, machinery used is kept in good condition. But, considering non-applied practices is evident that farms still 100% reliant on fossil fuel sources of energy and no actions have been taken in the restoration of degraded land. Agroforestry practices are very residual.

The low results in the **Water** theme can be explained because farms do not have a plan or set targets in reducing water consumption or improving water quality in the farm. In addition, farms present variability in the practices applied and two farms apply unacceptable practices. Nevertheless, there are common practices which all farms apply as planting locally adapted varieties and non-use of highly hazardous pesticides. Less extended practices but relevant in their usage are mulching, mostly paper and straw, use of drip irrigation or sprinklers and creation of buffer zones next to water reservoirs.

High and low variable results in **Land** theme are explained by the practices applied. The common practices applied are organic fertilizers (manure and crushed trimmings), application of liming to increase soil pH and subsoiling every 3 to 4 years. Mineral fertilizers are not applied in any farm. The low implementation of a planned crop rotation is surprising; however, reasons are diverse. On the one hand, farms in expansion cannot plan any crop rotation because fields are not still consolidated. On the other hand, another farmer stated that it depends. Furthermore, some farmers still practice bare fallows.

In reference to **Biodiversity** theme farm variability corresponds with the amount of practices applied to enhance biodiversity because; on the one hand, none of the farms has set targets or has a plan for habitat conservation or species conservation and; on the other hand, all farms exhibit a high diversity of production being the “less diverse” farm cultivating 18 species and 30 varieties. Therefore, practices condition differences among them. However, focusing in common applied practices to characterise farms all farms are organic and polyculture is practiced, some of them cultivated perennials and trees. Pest management is based in conservation biological control and application of organic pesticides when is needed and weed management is based in manual and mechanic modes. The presence of wild flower strips is common in almost all farms, areas left with wild vegetation are also common. However, there is no intention to serve as habitat connection areas. The introduction of N-fixing species is

extended. All farmers keep some seeds from year-to-year, basically local seeds. However, just one farm is involved in seed exchange. However, among fields are left bare during fallow in most the farms and no nesting aids are installed.

In reference to **Materials and Energy** farms do not have plans or targets set to increase renewable energy or reduce waste. Practices applied present some differences, however common practices can be described. Almost all farm use drip irrigation tape which is brought to the waste recycling centre. Boxes are purchased from different materials (cardboard, plastic and wood) and reused in most of the cases. Farms purchase manure from nearby farms, use low phytosanitary quantities and mulching material come from organic material as straw and crushed trimmings. The majority of the farms compost crop residues. In addition, farms hold dialogues on how to increase energy efficiency and purchase energy efficient machinery. Economic Resilience Dimension

The **Investment** theme presents farms which can meet their financial needs but with differences in their knowledge about their economic situation. Most farms have done investments in the last five years as greenhouses or water related investments as ponds or wells. Half of the farms have a business plan and know their total costs of production but just one knows their net income evolution of the last 5 years. None of the farms know the break-evenpoint of each product and in consequence price is determined according to market and experience.

In reference to the **Vulnerability** theme farms present very similar situations and strategies. The most extended strategies to overcome economic and environmental catastrophes are product diversification and staged crop cultivation. However, water ponds and greenhouses are also common. About its supply structures, farms never suffered input shortages because they have diverse procurement channels and have maintained long-term business relationships. It is interesting to mention that some farms have a joint plan with nurseries. The most common market channels are farmer markets which suppose important percentages of farm income, the second most important channels are direct farm sales. Other practices channels include box schemes (1 farm), restaurants (1 farm), consumer cooperative (1 farm), school meals (1 farm), farmers' cooperative shop (1 farm). All farms have a positive net cash flow but any farm has done steps to improve their financial security even if some of them do not have access to formal or informal money sources in case of crisis. Social Well-being Dimension

All farmers work more than 50 hours per week which complicates to pursue a **Decent Livelihood** because overtime is compulsory and not fully compensated. All farmers and its workers perceive from 650 to 1200 euros. In reference to the formation received, most of the farms use farmer's association and some assist to courses at local or regional institutions and use extension services. In addition, all farms can maintain and access to the necessary equipment.

The differences on **Labour Right** theme are due to the existence of binding contracts. Most of the farms, except one, have binding contracts for all workers on the farm. In some farms, owners are freelance.

Farms do not have any policy in reference to **Equity**. Therefore, discrimination is not prevented by documents in the farm. Nevertheless, there are no evidences of discrimination. In reference to gender, no evidences of discrimination were found but just two farms have women working.

The high scores in **Human Safety and Health** show farms which provide a safe clean and healthy workplace. Furthermore, all farms provide health coverage and can ensure fast evacuation in case of an accident even if they do not have emergency protocols. The variability among one half of the farms and the other half depends on the capacity of the farm to provide safety and health trainings. Half of them can and the other half cannot.

To sum up, farms show a weak recognition of sustainability as a final goal and therefore present issues to acknowledge how it effects its farming or the others. This translates in an absence of responsibility to collect performance information of their achievements or procedures and share it with stakeholders beyond "exchange time" orally. Farms apply mainly efficiency increase practices and substitution practices as drip irrigation systems and organic fertilisation. Furthermore, some redesign practices are also used like polyculture and conservation biological control but landscape management practices present low application (Wezel et al, 2014). Furthermore, farms still very reliant on external inputs e.g. fossil fuels. This helps farms to meet their financial needs and do investments to improve their sustainability situation. Nevertheless, seems they are at the mercy of market price fluctuations but maintain a good supply and market structures with a high diversification of market channels. The sensation is that farmers' low salaries for long hours help to maintain a good enterprise economic situation.

Furthermore, farmers are open-minded when hiring new people and interested to acquire new knowledge. Their working environments are healthy and accidents are prevented.

PGS farms Good Governance Dimension

The results in **Corporate Ethics** may be explained by the capacity of most farms to introduce all dimensions of sustainability in their definitions. This fact is supported because all farms have a website where information about the mission of the enterprise can be found complementing information gathered during the interview. Furthermore, farms can explain how the mission of the enterprise influences the work which they do and can give examples. Nevertheless, the most repeated were: seasonality, short distribution channels, local seed varieties use, agroecology, organic farming and close relation with consumers. Moreover, the mission is considered when defining new strategies in most cases. Lastly, just 3 out of 5 farms have a proactive risk management with informal protocols and can explain them properly. However, different protocols are followed in all cases.

The increment of variability in **Accountability** are produced by two reasons. First, even if all farms are part of the PGS, not all of them were audited at the same time or are being audited at the same time. Furthermore, some farms are in process of entering and have not been audited yet.[21] Second, farms collect and present their results, to stakeholders, in a different way and depth. Most farms gather information on the economic dimension. However, all farms maintain stakeholders informed and feedback is motivated and considered.

Participation is encouraged to different extent in all farms of the PGS. However, the approach to enhance participation in the farms is very similar. In most cases, farmers identify stakeholders by reviewing with whom the farm has direct relation meaning exchange of product, work and knowledge. Using this mechanism, almost all farms could recognise 50% of common stakeholders. Farms have a good level of engagement with all identified stakeholders

[21] During the period of the study farms were being audited following the PGS's second round of audits.

in all cases. The most mentioned stakeholders were consumers, workers and other farmers. In all cases, other farmers included members of the PGS and some of them included neighbouring farmers. Consumers were considered the most important stakeholder by all farmers and the group farmers dedicate more time. All farms have structured the participation of consumers through basically four ways: face to face during exchange time or assemblies when applicable, weekly email detailing products, periodical social media posts and open door farm days. In consequence of being the most cultivated relation is therefore the one from which most farmers could find the obstacles to engage them. Most of the farmers mentioned the current shopping culture, without connection with the food supplier, as the main obstacle to overcome. Mainly because box schemes require motivation and substantial engagement from the consumer. However, all farmers have developed strategies around communication to increase consumer's motivation. Summarizing, farmers consider just stakeholders with direct relation. Consumer are the most important stakeholders and strategies beyond communication during shopping time are developed to increase consumer's motivation.

Low levels of **Holistic Management** theme may be because it compiles the aspects less developed in all farms as plans and documentation. Nevertheless, there are farms which are half way of achieving good levels of sustainability because even if farms do not have written plans present objectives in all dimensions, evaluate them annually and report evolution to stakeholders. However, half of farms do not consider any of those aspects. In summary, farms compile and document very few things besides economic aspects. Environmental Integrity Dimension

Low and identical scores in **Atmosphere** theme are explained on the one hand, because farms do not have a plan or set target in reducing GHG emissions and Air Pollution and; on the other hand, all farms burn crop or other vegetal residues and other type of residues which it is considered an unacceptable practice. However, if farms are defined according to the practices which are applied, farms perception may change. Farms are organic and polyculture practiced. Soil fertility is maintained through optimized manure and crop residues application mixed, in some cases, with vegetal crushed trimmings. Fields have soil and stone bunds. Furthermore, engines and equipment are kept in good condition. However, farms are reliant in fossil fuel energy and no actions have been taken in the restoration of degraded land. Agroforestry practices are very residual.

Farms in the **Water** theme present strong similarities. First, all farms do not have a plan or set target in reducing water consumption or improving the quality of farm water. Second, farms apply similar percentages of practices applied and share a lot of common practices. Focusing on those common practices all farms use drip irrigation systems and sprinklers to irrigate locally adapted varieties. Furthermore, have adopted no spray buffer zones and highly hazardous pesticides are not used and farmers do not cultivate adjacent to water reservoirs. Another extended practice is the use of mulching using straw and/or paper. However, farms do not practice conservation tillage practices and harvesting water using of rainfall sensors or irrigation timers and water recycling is rare.

High scores in **Land** theme are explained by the high number of practices applied in all farms. Therefore, farms apply organic fertilizers (manure and crushed trimmings), liming to increase soil pH, subsoiling is practiced in all farms every 2 to 3 years and diverse crop rotation of a minimum of 3 years with inclusion of green manure. The use of cover crops is not extended.

The high variability on **Biodiversity** theme depends on the practices applied because all farms do not have set targets or plans for habitat conservation or species conservation and present high diversity production. The farm which grows less species cultivates 17 species and 39 varieties. In addition, the low results showed with one farm are due to the ploughing of longterm grasslands converted to arable land. Concentrating in common practices all farms are organic and polyculture is practiced, weed management is based in mechanic and manual modes and pest management is based in conservation biological control with application of organic phytosanitary when pest get out of control or for specific pests. Most of the farms follow 4-year crop rotation with nitrogen fixing species and almost all farms do not leave bare fallows. Flower strips are planted on the edges of the fields. The edges which are not planted with flower stripes are left for wild vegetation however, it cannot be considered that can serve as ecotones. All farms save some seeds.

Farms do not have a plan or set target to increase renewable energy or reduce waste. Accordingly, the scores of each farm in **Materials and Energy** depend on farm current material consumption, energy saving and waste reduction. Even if inputs and waste considered are the same, farms purchase and dispose materials in a very different way. Nevertheless, some commonalities arise. In reference to inputs used, all farms are conscious of the necessity to reduce non-recyclable drip irrigation tape and the majority of the farms are transitioning to different alternatives. Furthermore, most farms purchase boxes which farmers can reuse and some of them purchase recyclable boxes. Mulching materials are biodegradable in all farms as straw, crushed trimmings, crop residues and paper. All farms purchase manure from nearby farms. Almost all farms are conscious about the necessity of a proper disposal of waste and the best available option is used. In reference to energy saving, the most extended practices are maintaining dialogues about ways to save energy, mostly around the distribution and logistics, the use of efficient machinery and insulating buildings especially cold storages. Therefore, farms are conscious however there is still a lot of room for improvement. Economic Resilience Dimension

The high variability of scores in the **Investment** theme shows different approaches to farm economic administration. Almost all farms have done investments which aim at creating revenues in the next five years. Most investments are new machinery, greenhouses or a cold storage room. Nevertheless, just half of the farms have a business plan completed and used to inform decisions. All farms can meet their financial needs and almost all farms have knowledge about the evolution of their net income on the last five years. Those net incomes show growth in all cases. Lastly, most of the farms know their total cost of production with fix and variable costs but just one knows the break-even-point for each product. Hence, prices are oriented using a list of prices agreed for all members in the PGS.

The **Vulnerability** theme shows farms with very similar strategies and situations about economic stability. The main strategies followed to overcome economic or environmental emergencies are diversified production, staged cultivation and networking. In addition to diverse procurement channels, networking becomes an important strategy to overcome rare input shortages through input and tools exchange among farmers. All farmers have long-term beneficial business relations. The planning with nurseries is very extended. The most extended market channels are box schemes and sales to other farmers. Other minor channels are direct farm sales (1 farm), school meals (1 farm), restaurants (1 farm), specialized shops (1 farm). In addition, some farms generate income through school farm visits (1 farm) and conferences (2

farms). All farms have a positive net cash flow but just one farm has access to monetary sources and no steps have been taken to improve farm financial stability

Social Well-Being Dimension

Farm scores in **Decent Livelihood** show most of the farms in a similar situation and one farm scoring much higher. The reason of this difference is due to hours per week worked by farmers. For most farms overtime is compulsory and not fully compensated. Farmers work more than 50 hours per week. All farmers perceive between 650 to 1200 euros per month and consider that a living wage is between 1200 and 1500 euros. In reference to external support received by farmers, extension services are rarely used and trainings by major buyers are not joined. Among the options more used are trainings offered by different institutions (government and schools of agriculture), local or regional farmer associations (at least 2 organisations per farm) and conferences. However, some farmers would like to be able to assist to more formation but workload do not allow them to. Furthermore, most of the farms can maintain their facilities and have access to necessary equipment when needed.

In reference to **Labour Rights**, just one farm does not offer binding contracts to all workers. The rest do and some farm owners are freelance.

Farms have a policy in reference to **Equity**, concretely about non-discrimination. This policy depicts from the PGS network which states that no-one can be discrimination for origin or gender. The non-compliance of this policy is a reason to be spelled from the network. Furthermore, all farms except one have parity in male and female members.

Despite similar scores, in exception of one farm with important issues, farms present different situations in **Human Safety and Health** theme. First, most farms have not provided safety and health trainings to all farm workers. Second, half of the farms do not have sanitary facilities. Third, most farms provide health coverage. All farms can ensure a fast evacuation in case of accident.

To sum up, farms show a strong recognition of sustainability as final goal and can explain how it affect their farming or the others. Consequently, farms present strong duty to gather information and report to their stakeholders and motivate their feedback. Farmers use personal modes to engage stakeholders particularly consumers with an important role for social networks or internet tools to maintain consumer motivation. Farms present problems when dealing with vegetation residues. They apply mainly efficiency increase practices and substitution practices as drip irrigation or locally adapted seeds. Furthermore, some redesign practices are applied as crop rotation, polycultureand conservation biological control. Landscape management practices are considered but not widely applied (Wezel et al, 2014). Furthermore, farms still very reliant on external inputs e.g. fossil fuels. All farms can meet their financial needs and show knowledge on their economic situations but the lack of knowledge about the break-even point left them selling in approximate prices. Farms maintain a good supply and market structures with a high diversification of market channels. Farmers' low salaries for long hours help to maintain a good enterprise economic situation. Furthermore, farmers are open-minded when hiring new people and interested to acquire new knowledge. Their working environments are healthy and accidents are prevented.

7.1.3. Farm Sustainability and certifications

This section discusses the differences between PGS farms and CCPAE farms through the discussion of the PGS average and the counterfactual and try to relate their differences to what can be taken by being part of the PGS, without forgetting other context situations which can influence the results. Therefore, the themes showing the biggest differences are discussed more in depth. The objective of the thesis was not to improve the certification it is just simply state the effects for farms of being part of a PGS.

Good Governance dimension

The different scores between PGS farms and CCPAE farms in **Corporate Ethics** respond to differences in sustainability consideration, farm mission definition, farm mission influence and risk proactivity. First, farms in the PGS consider three sustainability dimensions as social, environmental and economic and understand that just the accomplishment of the three will guide farms to sustainable development. According to it, farms in the PGS go beyond the vision of organic as sustainable of the CCPAE farms. Second, the differences in considering sustainability reflect on the mission which in PGS farms are more holistic and embrace the idea of transforming the current food movement. Third, maybe fruit of this collective aim of transforming the food system all farms in the PGS use the social networks and farm website to transmit their mission and the way which influences them while CCPAE farms are not using it. Mission's influences shared among CCPAE farms and PGS farms are organic farming, short distribution channels and seasonality. Fourth, PGS farms are more proactive about risk management.

Therefore, in this theme seems apparent the incidence of the PGS certification in the different sustainability scores. Specially, what in the credibility principles is considered Sustainability. The first two points may be a reaction of the participatory process followed to define what Sustainability means in the certification (Moya, 2009). It is a collective definition; all farmers were involved in defining what sustainability means to them and maybe later farmers decided to incorporate it to the objectives of the farm. However, it is possible that farmers had already defined by themselves sustainability and viewing their similarities with the PGS decided to join the network and the certification. However, in general farms in CCPAE are 'younger' and maybe more idealistic objectives have not been developed yet due to the necessity to make the project economically viable at the beginning. The third discordant point between both certifications can be affected by the Relevance and Transparency credibility principles of the PGS certification. The Marketing and distribution criteria stresses the idea of "*maintaining transparent information with consumers and other members of the network*". To fulfil this requirement all farms in the PGS have a webpage connected to the PGS website and use social networks to explain their objectives which facilitate the recognition of the mission for the researcher. Finally, Tallontire et al., (2012) states that risk minimisation proactivity is a motive to adopt standards together as important as market differentiation when considering sustainability standards and seems that PGS members are more motivated and therefore, they entered to the PGS however, there is no direct relation to the structure or standards.

The **Accountability** theme also present strong differences. There are three main differences: First, Monitoring and evaluation of all dimensions of sustainability it is just provided by the PGS. Second, even if most farms in both groups just monitor and evaluate economic features of sustainability some farms in the PGS integrate environmental and social performance. Third, reporting or disclosing information to stakeholders is still a pending work for farms in the CCPAE while farms in the PGS understand and consider the disclosure of information as their duty.

In reference to the information presented above, Sustainability, Accessibility, Relevance and Transparency credibility principles may act in Accountability scores. The first and second points may be caused by PGS Sustainability and Accessibility principles. Concretely, to the topics considered in the peer review audits and in the entering process for new members (environmental, social and economic) which the CCPAE certification does not contemplate. The focus of the PGS certification in the productive project instead of the product can condition this approach too. Therefore, the periodic auditing on all dimensions of sustainability obligates the reporting of sustainability performance to farmers and workers considered two of the three most important farm stakeholders together with consumers. The third point, seems affected in the same way as the last point in Corporate Ethics.

Consumer-farmer relationship is key to understand the differences in **Participation**. However, the first differences appear in identifying stakeholders, CCPAE farmers identified less than 50% of common stakeholders and PGS farms 50%. CCPAE farmers considered product and money exchange and PGS farmers added work and knowledge exchange to their mechanisms to identify stakeholders. For both groups, the most identified stakeholders were workers and consumers but PGS farmers considered other farmers in the same frequency too. In reference to consumer- farmer relationship the main differences are that farms from the PGS develop strategies to enhance communication beyond dialogues during shopping time, can identify engagement obstacles and motivate consumers to engage transcending just the product and embracing the project.

Among the themes which seems affected for the certification, Participation is the most affected. It seems to be affected by Sustainability, Relevance, Rigour and Engagement. Sustainability credibility principle may affect participation globally because it is a key element of the certification. In reference to Rigour, the fact that farmers carry out peer audits, present improvement proposals and have common global goals may affect the identification of other farmers as stakeholders through knowledge exchange. However, the great amount of product exchanged among them may be another reason too. Furthermore, the structure of the PGS based in different assemblies and consensus democracy defined in Engagement credibility principle obligates a periodic participation of PGS and farm stakeholders which enhance their identification as stakeholders. Relevance credibility principle may affect participation through a marketing and distribution criteria which states that "*farmers should enhance the participation of consumers and motivate their inclusion in the decision-making process*". However, the choice of different marketing channels in the PGS compared with CCPAE farmers, specially box schemes is perceived to require higher implication from consumers and therefore, more motivation from farmers to achieve it.

Both groups of farms aim at Sustainable Development. Nevertheless, their management and structure differ. Those differences are reflected in **Holistic Management** theme. Both groups

of farms have very little documented strategies if any. However, more farms inside the PGS control economic features of the farm and some of them even have objectives in all sustainability dimensions.

Environmental Integrity dimension

CCPAE farms outperform PGS farms in **Atmosphere** because PGS farms burn crop, vegetation or other material residues which SAFA considers an unacceptable practice. Focusing in similarities, both groups do not have any plans or target to reduce GHG emissions and Air Pollution. Furthermore, both groups of farms practice polyculture, maintain soil fertility with a mixture of manure, crop residues and some crushed trimmings and soil erosion is avoided with soil or stone bunds. Machinery and equipment is maintained in good condition. From the negative side, farms are still 100% reliant in fossil fuel sources of energy and no farm has acted to restore degraded land. Agroforestry practices are very residual.

Interesting to point out is the fact that atmosphere theme is the lowest sustainability level due to the burning of crop residues despite being regulated by the waste directive in Relevance: "*Crop residues should be composted or use as feed. When is not possible should be crushed, and incorporated to the soil. Burning crop residues or moving them out of the farm must be avoided. Inorganic residues must be managed properly*." Therefore, there is a general noncompliance with one directive. This case of non-compliance suggests that the lack of sanctions or consequences for non-compliance may facilitate farmers' non-compliance in practices difficult to follow. Farmers also state to have time constraints to fulfil all PGS norms.

Farms in both groups do not have plans or set targets in reducing water consumption or improving water quality in the farm. Therefore, differences in scores on the **Water** theme are due to the practices applied by both groups. Focusing on similar practices applied, farms use mulching with straw and/or paper, use drip irrigation systems or sprinklers, use local seeds, adopt no spray buffer zones next to water reservoirs and do not use of highly hazardous pesticides. On the other hand, a non-applied practice in any farm of both farm groups is conservation tillage. Therefore, according to the strong similarities between both groups the cause of the difference is that two farms of the CCPAE group applied non- acceptable practices which reduces the group average result.

The unacceptable practices applied in CCPAE farms are not regulated under PGS certification.

The difference on **Land** is because most of the farms in the CCPAE have not have a planned crop rotation. The rest of the practices are applied equally in both group of farms.

In both certifications crop rotation is regulated by directives. Therefore, the relevance credibility principle affect all farms. The CCPAE certification states: "*In exception of permanent grasslands, perennial crops and flooded crops, the operator must establish a multiannual crop rotation including legumes and other green manure crops every three years"* and PGS certification states: "*Soil conservation must be based in organic matter application as manure, compost, green manure, crop residues and mulching, crop rotation and intercropping*". However, in SAFA a key concept in this practice is the word 'planned'. Therefore, in all farms crop rotation can be practiced but not following a plan. The fact that more farms in the CCPAE are in a period of expansion (cultivating more land from season to

season) and not having delimitated farm hectares can cause this difference in practice application.

None of the farms have plans or set targets for **Biodiversity** conservation and present high diversity of production. Furthermore, most of the farms focus their pest management in conservation biological control (organic pesticides are used as last resource) and weed control is done mechanically and manually. Farms have wild flower strips and edges are left with wild vegetation, N-fixing species are used in the rotation and seed saving is practiced. Less extended practices are creation of ecotones and habitat connectors; installation of nesting aids and establishment of multi-species tree stands or bushes. The only practice widely applied in one group and not the other is that farms in the PGS do not left bare fallows. Nevertheless, the difference among average farms is reduced when one of the PGS farms has converted grasslands into arable lands reducing the average result of PGS farms.

In both certifications, there exist directives in crop management detailed in Relevance credibility principles. On the one hand, some directives state the necessity of using green manure during fallows however according to its farm application does not seem obligatory in the CCPAE. On the other hand, crop management directives in the PGS state that "*a minimum of 10-15 species must be cultivated per season (Spring- Summer or Fallow- Winter)*". The high diversity of species in both groups may be caused for short marketing channels which necessitates a high variety of product to be competitive. The fact that diversified production is a mechanism to reduce farm economic vulnerability may be an indicator that this practice will be followed even if no directives will exist. Functional biodiversity is also regulated in the crop management directive by the PGS, however its application in both farm groups denotes its wide application.

Farms do not have any plans or set targets in reference to **Materials and Energy** theme. Therefore, the similarities on scores respond to similarities in practices applied. Farms in both groups reuse boxes and mulching materials are biodegradable and come from inside materials, non-organic manure is purchased from nearby farms and the best available option to dispose waste is enhanced. However, is better followed by CCPAE farms. The only relevant differences among the two groups is that PGS farms are transitioning to eliminate the use of drip irrigation tape to more durable options and CCPAE farms compost their crop residue. In reference to energy, both groups of farms hold dialogues about reducing and increasing the efficiency of energy use in the enterprise, efficient machinery is used and buildings especially cold storages are properly insulated. All farms in the CCPAE have a cold storage but not all in the PGS.

PGS certification states the necessity to manage properly inorganic residues and crop residues. Nevertheless, the better waste management in CCPAE farms with no regulation from the certification seem to offer another example of general non-compliance. However, during my assistance to the PGS local node assembly waste was a point of discussion in the agenda.

<u>Economic resilience dimension</u>

Farms group average scores in **Investments** theme are similar. All farms can meet their financial needs and most farms have done investments which aim at creating revenues in the next five years focusing on machinery, greenhouses and ponds or wells. Some farms in both groups have business plans. Most of the farms know their total costs of production in both groups, however, farms in the PGS present better knowledge on the evolution of their net income during the last five years. Most farms of both groups do not know the break-even-point

of each product. Therefore, the prices are fixed following different mechanisms. In the CCPAE farms prices are fixed through experience and market dynamics while PGS farms prices are oriented using a list of prices agreed for all members in the PGS.

The PGS certification seems not to provide a better investment capacity thanks to premiums prices as stated by a farmer (PGS committee member) which concords with the statement in Tallontire et al, (2012) that willingness to pay for ethical characteristics is limited. Nonetheless, the influence of the PGS is evident in the collective pricing which seems the chosen mechanism to "*guarantee equitable and fair prices*", objective which falls under Practice economic transformation and collected in Sustainability in the credibility principles.

Farms in both groups present similar strategies to reduce the **Vulnerability** of their farms. To maintain the stability of production farms in both groups diversify their production and stage their crop cultivation. In addition, networking (exchange of product, knowledge or tools) is an important mechanism developed for farms in the PGS. All farms from both groups have diverse procurement channels and have preserved long-term beneficial business relationships with suppliers. In order to maintain a stable market for their products, all farms use diverse marketing channels. Nevertheless, on the one hand, CCPAE farms prefer farmer's markets and direct farm sales. On the other hand, PGS farms choose box schemes and exchange with other farmers. None of the farms of both groups have taken steps to improve farm financial stability through access to external monetary sources. All farms have a positive net cash flow.

Even if vulnerability does not present relevant differences in both farm groups may uncover two important aspects. First, the different preferences between marketing channel choice in both farm groups. The main difference between markets and direct farm sales (CCPAE) and box schemes and selling to other farmers (PGS) is the necessity to agree on the products beforehand and therefore more communication between the buyer and seller. Second, the reliance among farmers to reduce their vulnerability. Looking at it from another point of view, networking seems to provide farmer empowerment (IFOAM, 2014), build social capital (Talllontire et al., 2012; IPES-food, 2016) and increase adaptation capacity (IPES-food, 2016) because farmers are self-reliant and hold control over the way to use resources. Social Well-being dimension

In both groups achieving a **Decent Livelihood** is hampered because farmers working overtime is compulsory and not fully compensated, reaching in both groups more than 50 of work as average. All farmers perceive between 650 to 1200 euros. In reference to formation attended, farmers in both groups prefer trainings offered by government or agricultural schools and regional farmers associations. In addition, CCPAE farmers use extension services and PGS attend conferences as other sources of knowledge. Farms can maintain their facilities and have access to necessary equipment.

The PGS certification does not seem to provide a better farmer livelihood situation.
Nevertheless, seems that extension services are replaced by the support received from other farmers through knowledge exchange and therefore from the certification. However, it can be also that extension services cannot provide advisory on agroecological knowledge (Wibbelmann et al., 2013). In addition, working overtime probably cause time constraints to participate in the PGS certification like in other PGS (IFOAM, 2014) reducing the efficiency of the certification. Being a reaction from farm sustainability to PGS certification. Therefore,

improvements on this topic may improve overall farm sustainability results through increase of certification efficiency and farmer compliance capacity.

Most of the farms provide binding contracts to all farm workers ensuring the compliment of worker **Labour Rights.**

None of the farms present discrimination for a specific demographic group. However, PGS farms have a regulate **Equity**. This regulation is affected by the relevance credibility principle, concretely by the Organization, Legal Regime and Labour Situation directives: "*It is not accepted any kind of discrimination by gender, origin or other personal conditions*."

The score difference in **Human Safety and Health** depicts from two reasons. First, most of the PGS farms do not provide safety and health trainings while some CCPAE farms do. Second, some farms in the PGS do not have sanitary facilities while all farms in the CCPAE group provide a safe, clean and healthy workplace. All farms in both groups do not have emergency protocols but can ensure fast evacuation in case of accident.

This theme it is not regulated in any way by the certifications studied.

To summarize, PGS farm average and its counterfactual present similar patterns, in exception of the Governance dimension. The differences may be attributed to the PGS action Nevertheless context (microlevel and macrolevel) may offer valid explanations too. There are not important differences in economic, social and environmental dimensions. Focusing on the governance dimension, the actions motivated from the certification which seem to provide the most important impacts is the participatory process which is used in all actions in the certification. Furthermore, the shared vision around sustainable development and agroecology motivates a close relation between stakeholders with personal communication about marketing issues but also about sustainability issues. Last, general non-compliance situations have been identified affecting the environmental dimension.

7.2. Limitations and further research

In order to study the effects of certifications in farm sustainability in organic Short Marketing channels for fresh vegetables in Catalonia, this thesis aimed to analyse several farms sustainability performance in two different certifications, the European organic certification and La Xarxeta PGS. To reduce the complexity, the area of study was reduced to two different counties and just one local node in the PGS. However, the study will have been enriched by the study of all farms inside the PGS reducing biases produced by single farm results. Furthermore, an expansion on the study of farms inside the CCPAE certification would have benefited the reliability of data by the same reason.

In addition, to the limitation produced by the small number of farms selected for the study, there are limitations in the selected farms itself. The main limitation which may have produced biases in the data is the building of the counterfactual. Not all farms fulfilled the counterfactual conditions. This fact constraints the analysis of data in ex-post comparative analysis in voluntary standards because there was not a clean control group of farmers adding other

possible options to explain sustainability results (Blackman and Rivera, 2011; Tallontire et al., 2012).

The representation of sustainability presents important limitations too. The fact that performance indicators e.g. greenhouse gas emissions, water consumption or information about prices were not calculated restrain results, and does not provide a solid basis to assess quantitatively sustainability performance, impeding to draw a baseline. The inclusion of these indicators in further research will provide a better representation of farm sustainability than the one achieved in this study. A final goal for further studies, will be the calculation of a complete SAFA in all farms, however it seems almost an impossible endeavour. Acknowledging the strong difficulties to calculate a full SAFA in all farms, another option to benefit the results can be by a change on its implementation through the development of a participatory research and develop a bottom-up regional assessment (Binder et al., 2009). Farmers in the study should be included when deciding which themes, subthemes and indicators must be calculated and which not. This will give a real idea about farmers' sustainability values and probably all relevant themes, subthemes and indicators would have been included. In consequence, the affection of certifications to farm sustainability should have been more accurate.

The analysis of certifications also present important improvements for further research. In addition, to the analysis of credibility principles a theory of change could be updated building on the work done by Moya (2009). A theory of change describes how the objectives will be achieved. It is a recommendation of ISEAL on certifications, and the idea is to connect the activities a program does to the way those lead to the desired goals. The development of a guided workshop may provide the perfect platform to do it because the PGS have good group dynamic. Relevant to this point, an important aspect for further research on the PGS is to analyse in which way consumer can be introduced in the PGS. Their inclusion can provide incentives to farmers as reduction of workload, bring premium prices and include, fully, the other end of the food system to increase the transformation potential of the PGS. However, it is one topic where most PGS struggle (IFOAM, 2014). Furthermore, the analysis on how to implement a protocol for consequences of non-conformity could be studied. This could boost the compliance with the certification and in consequence increase the transformation potential of the PGS too.

Finally, farmers' perceptions also present limitations. One of the main limitations is the short answers given by farmers when asked about certifications. Therefore, it has restrained the discussion due to the lack of guidance on possible outcomes. This limitation may be connected to the development of the interview guide (certification questions were at the end) and therefore farmers were tired. The openness of the question could also brought more difficulty to answer it, maybe more concrete questions would have obtained more positive outcomes. Nevertheless, has brought new knowledge about the perception of the CCPAE certification for smallholders selling through short marketing channels. Farmers seem discontent about the functioning of the certification. Therefore, further studies on the perceptions of farmers on the CCPAE certification may help to improve the scheme by modifying aspects of regional competence.

7.3. Recommendations for practical implementation

The focus of this thesis has been farmers and how to improve their future situation by acknowledging their current situation. Therefore, this section will be focus in a set of

recommendations in the microlevel. Furthermore, the study of the certifications has provided the capacity to propose recommendations in the mesolevel. All recommendations, in the microlevel and in the mesolevel have been collected from the result analysis section.

Farms in the CCPAE group should create an enterprise mission and vision to facilitate the increasing of farm sustainability. SAFA results have demonstrated the necessity to write down ideas, processes and plans as a requirement to evolve and to maintain the principles. A clear objective seems necessary in any project. Furthermore, to provide a better engagement from consumers and improve the communication the use of social networks seems to provide a great platform to bring the field to the homes. In this space, farmers can provide explanation of how the food is grown and report on any issue. This actions will help to increase the sustainability of the farm thanks to consumer involvement.

Farms in the PGS should stop to burn crop residues and shifted towards composting. The burning of crop residues has been the most decisive practice in all the assessment. The stop of crop residues will rise notably the sustainability performance in the atmosphere theme.

Farms in both groups should try to introduce more perennials in their lands. After the assessments, there is a general lack of bushes in the area which provide a perfect habitat for functional biodiversity and can increase product diversity if edible bushes are considered. All farms have the space necessary to developed.

The recommendations for practical implementation target the increase in sustainability of the farms under study. However, further research could be focalised on how this sustainability improvements will benefit farmers' situation.

In the mesolevel, PGS farmers should start a collective calculation of break-even-point to reduce its vulnerability over the market. A good starting point can be the development of a protocol to calculate it. Furthermore, a collective risk management protocol needs to be introduced in all farms.

Finally, the introduction of the farms in the CCPAE study could be benefitial for the PGS. Most of the farms in that scheme present very similar practice implementation and through the accompany of PGS farmers could improve notably its sustainability in the governance dimension and become full right members of the PGS. The inclusion of more farmers in the PGS could provide more volunteer work which therefore may benefit all members of the PGS trough ensuring a better functioning of the certification.

8. CONCLUSIONS

The study of the PGS and its relation to farm sustainability represents the first study of its kind in Catalonia. The study shows strong differences in the governance dimension of sustainability. This indicates that La Xarxeta PGS present a great potential to move towards sustainable development in short marketing channels in the organic Catalan food system. Even if it is difficult to give an exact level food system transformation (Gliessman, 2015:278-279;2016) due to the complementarity of management practices applied in farms of both groups. Both groups of farms are between level 2 and level 3. The design of the farms under study seems to focus in root causes and have a whole-system approach which focus on prevention rather than curation. However, there is still a lot of reliance in external inputs. However, when focusing on

the other two levels farms they present different transformation potential. On the one hand, the CCPAE farms are in level 4 because they stablish a more direct relation between consumer and producer through short marketing channels. On the other hand, farms in the PGS "*build a new global food system based on equity, participation, democracy and justice*" (Gliessman, 2016) in a great measure thanks to the PGS.

The greater potential of the PGS to transform food systems in opposition to CCPAE certification lies in three main differences of approach among them. First, PGS transforms the communication between its stakeholders through consensus democracy grounded in the autonomy of their stakeholders. Second, establishes horizontal power relations among stakeholders which helps to connect the microlevel (farms) with the mesolevel (community). While in the CCPAE the certification detaches its clients (farmers) from the decisions. Third, the PGS certification considers sustainability more holistically integrating food systems and certifying farms in contrast with the CCPAE certification just considering management aspects and certifying products.

The detachment among farmers and the CCPAE certification is corroborated by farmers' perceptions in both groups about its effects on farm sustainability. Farmers in both groups consider to have low effects on their sustainability because they were previously motivated for sustainable development. Nevertheless, they stress its utility to open new marketing channels with less direct effect reducing the certification as a marketing tool. PGS certification is not perceive as providing any sustainability outcomes however, it increases the socialization between farmers and allows collective learning which in fact may provide sustainability outcomes as building social capital. Farmers do not perceive the PGS as part of their enterprise because during the interviews several aspects considered in the certifications were not recognised by farmers.

REFERENCES

Altieri, M.A. (2009) Agroecology, small farms, and food sovereignty. *Monthly review*. Vol, 61:3, pp.102-113.

Badal, M; Binimelis, R; Gamboa, G, Heras, M; Tendero, G. (2011) *Arran de Terra, Indicadors Participatius de Sobirania Alimentaria a Catalunya, Resum de l'Informe*. Associació entrepobles, Institut d'Economia Ecologica i Ecologia Política.

Bernard, R.H. (2005). *Research Methods in Anthropology: Qualitative and Quantitative Approaches.* Oxford: Altamira Press.

Binder, R. C., Feola, G. & Steinberger, J. K. (2010) Considering normative, systemic and procedural dimensions in indicator-based sustainability assessments in agriculture. *Environmental Impact Assessment Review*, vol 30, pp 71-81

Binimelis, R., Monterroso I., & Rodriguex Labajos, B. (2009) Catalan agriculture and genetically modified organisms (GMOs) — An application of DPSIR model. *Ecological Economics.*

Binimelis, R. & Descombes, C, A. (2010) *Comercialització en circuits curts. Identificació i tipologia.* Escola Agraria de Manresa.

Blackman, A. & Rivera, J. (2011) Producer-level benefits of sustainability certification. *Conservation biology*, vol 25:6, pp 1176-1185

Boza Martinez, S. (2013) Los sistemas de garantía en el fomento de los mercados locales de productos organicos. *Polis revista de la universidad Bolivariana*, vol 12:34.

Cabrera, D & Colosi, L (2008) Distinctions, systems, relationships, and perspectives (DSRP): A theory of thinking and of things. *Evaluation and Program Planning*. vol 31, pp. 311-334

Cabrera, D., Colosi, L. & Lobdell, C. (2008) *Systems thinking*. Evaluation and program planning. Vol 31, pp. 299-310.

Cabrera, D., Cabrera, L. & Powers, E. (2015) *A unifying theory of systems thinking with psychosocial appliocations.* Systems research and behavioural science. Vol 32, pp. 534-545.

Carden, F., Bamberger, M. & Rugh, J. (2009) *Alternatives to the conventional counterfactual.* follow-up note on Session 713 Think Tank, American Evaluation Association annual conference, Orlando

CCPAE (2013) *Guia per a la certificació ecològica. Tot el que cal saber per formar part del registre d'operadors del CCPAE*. Generalitat de Catalunya. Ed1. Barcelona.

CCPAE (2016) *Qui som?* Available at: http://www.ccpae.org/index.php?option=com_content&task=view&id=30&Itemid=208&lang=en#.VtbDk032ZaQ [2016- 03-03]

CCPAE (2016a) *Memòria d'activitats I de gestió econòmica del Consell Català de la Producció Agrària Ecològica 2015.* Barcelona: Consell Català de la Producció Ecològica.

CCPAE (2016b) *Guia d'Operadors de la Producció Agraria Ecològica a Catalunya.* Available at: http://81.92.138.108/GD/guiaDirectoriWebHome.action?request_locale=ca [2016-06-08]

CCPAE (2016c) *La certificació ecològica*. Available at: http://www.ccpae.org/index.php?option=com_content&task=view&id=36&Itemid=209&lang=en#.VtgbJE32ZaQ [2016- 03-03]

CCPAE (2016d) *Acreditació ENAC*. Available at: http://www.ccpae.org/index.php?option=com_content&task=view&id=32&Itemid=205&lang=ca_ES%20-%20.V0Q1gU1f1aQ#.V1famU1f1aQ [2016-06-08]

CCPAE (2016 e) *Normativa UE I QNT*. Available at: http://www.ccpae.org/index.php?option=com_content&task=category&sectionid=9&id=85&Itemid=148&lang=ca_ES [2016-06-08]

CCPAE(2016f) *Quotes*. Available at: http://www.ccpae.org/index.php?option=com_content&task=view&id=387&Itemid=231&lang=ca_ES#.WB9_4frhDD4 [2016-11-08]

CCPAE (2016g) Intereco. Available at: http://www.ccpae.org/index.php?option=com_content&task=view&lang=en&id=33&Itemid=205#.WB-AnvrhDD4 [2016-11-08]

CEO (2015) Baròmetre 2015 de Percepció i Consum dels Aliments Ecològics.

Council Regulation (EC) No. 834/2007 of 28 June 2007 concerning production and labelling of organic foods.

Cuéllar- Padilla, M.C. (2009) *Hacia un Sistema participativo de Garantía para la Producción Ecológica en Andalucía.* Servicio de publicaciones de la Universidad de Córdoba.

Cuéllar- Padilla, M. C. & Calle Collado, A. (2009) *Sistemas participativos de Garantia. Poder, Democracia y Agroecologia.* I congreso español de sociología de la alimentación, Universifad laboral de Gijon 28-29 May, 2009, Spain

De la Cruz Abarca, C, S. (2016) *Organizaciones, sistemas participativos de garantía y procesos agroecológicos en Andalucía*. PhD Thesis. Universidad de Córdoba.

Di Masso Tarditti, M. (2011*). Las fronteras de una alimentación alternativa: explorando los límites del movimiento alimentario transformador en Cataluña*. II congreso español de sociologia de la alimentación, Universidad de Vitoria-Gasteiz 14-15 July, 2011, Spain

European Commission (2011) *Working document of the Commission services on official controls in the organic sector.* Brussels: Directorate H. Sustainability and quality of agriculture and rural development H.3. Organic farming

European Commission (2014-10-17). *Agricultural and rural development Organic Farming, EU Law on organic production: An overview*. Available at:

http://ec.europa.eu/agriculture/organic/eu-policy/eu-legislation/brief-overview/index_en.htm [2016-06-15]

European Commission (2014a). *Agriculture and rural development Organic Farming, Expert Hearings.* Available at: http://ec.europa.eu/agriculture/organic/eu-policy/policydevelopment/expert-hearings/index_en.htm [2016-06-08]

European commission (2014b). Agricultural and rural development Organic Farming, legal frame. Available at: http://ec.europa.eu/agriculture/organic/eu-policy/eu-rules-onproduction/legal-frame/index_en.htm [2016-06-15]

European commission (2014c). Agricultural and rural development Organic Farming, organic farming policy: The historical background. Available at: http://ec.europa.eu/agriculture/organic/eu-policy/eu-legislation/historicalbackground/index_en.htm [2016-06-15]

European Commission (2014d). *Agriculture and rural development Organic Farming, the organic logo guarantees*. Available at: http://ec.europa.eu/agriculture/organic/consumertrust/certification-and-confidence/the-organic-logo-guarantees/index_en.htm [2016-06-07]

European Commission (2015). *Agriculture and rural development Organic Farming, Civil Dialogue Group on Organic Farming. Available at:* http://ec.europa.eu/agriculture/organic/eupolicy/eu-legislation/civil-dialogue-group/index_en.htm [2016-06-08]

European Commission (2015a) *Agriculture and rural development Organic Farming, Consultation with Stakeholders.* Available at: http://ec.europa.eu/agriculture/organic/eupolicy/policy-development/consultation-with-stakeholders/index_en.htm [2016-06-08]

European Commission (2015b). *Agriculture and rural development Organic Farming, Interservice steering group.* Available at: http://ec.europa.eu/agriculture/organic/eu-policy/policydevelopment/inter-service-steering-group/index_en.htm [2016-06-08]

European commission (2015c) EU legislation review and Organics Trade regime: State of play. Biofach, 12 February, Nuremberg.

European Commission (2016). *Agriculture and rural development Organic Farming, Policy development*. Available at: http://ec.europa.eu/agriculture/organic/eu-policy/policydevelopment/index_en.htm [2016-06-07]

FAO, 2013. *SAFA Guidelines, Sustainability Assessment of Food and Agriculture systems. Version3.0.* Rome: Food and Agriculture Organization of the United Nations

Forssell, S. & Lankoski, L. (2014) The sustainability promise of alternative food networks: an examination through “alternative” characteristics. *Agricultural Human Values*. Vol. 32, pp.6375.

Francis, C., Lieblein, G., Gliessman, S., Breland, T. A., Creamer, N., Harwood, R., Salomonsson, L., Helenius, J., Rickerl, D., Salvador, R., Wiedenhoeft, M., Simmons, S., Allen,

P., Altieri, M., Flora, C. & Poincelot, R. (2003). Agroecology: The Ecology of Food Systems. *Journal of Sustainable Agriculture*, 22(3), 99-118.

Galt, R. E. (2013) Placing food systems in first world political ecology: a review and research agenda. *Geography compass*, vol 7:9, pp. 637-658.

Gamboa, G., Kovacic, Z., Di Masso, M., Mingorría, S., Gomiero, T., Rivera-Ferré, M & Giampietro, M. (2016) The complexity of food systems: Defining relevanyt attributes and Indicators for the evaluation of Food Supply chains in Spain. *Sustainability*, vol 8, pp. 515538.

Generalitat de Catalunya (2006). *Llibre blanc de la producció agroalimentaria ecològica a Catalunya.* Generalitat de Catalunya, Departament d'agricultura, ramaderia i pesca.

Generalitat de Catalunya (2007). *Producció Agroalimentaria ecològica (PAE), Consejo Catalán de la Producción Agraria Ecológica.* Available at: http://pae.gencat.cat/es/informacio-general/consell-catala-produccio-agraria-ecologica/ [2016-11-06]

Generalitat de Catalunya (2011). *Producció agroalimentària Ecològica (PAE), Principis i objectius.* Available at: http://pae.gencat.cat/ca/informacio-general/principis-objectius/ [201606-07]

Generalitat de Catalunya (2012) *Normes tècniques_i criteris d'aplicació de la normativa europea de producció i etiquetatge dels productes ecològics*.

Generalitat de Catalunya (2015) *Producció agroalimentària ecològica (PAE). Sistema de Control*. Available at: http://pae.gencat.cat/es/informacio-general/sistema-control/ [2016-1106]

Generalitat de Catalunya (2016). *Producció agroalimentària Ecològica (PAE), Normativa*. Available at: http://pae.gencat.cat/ca/normativa/ [2016-06-07]

Generalitat de Catalunya (2016a) *Producció agroalimentària Ecològica (PAE),Publicacions i Materials de referència.* Available at: http://pae.gencat.cat/ca/publicacions-materialsreferencia/ [2016-06-08]

Gliessman, S. R. (2007) . *Agroecology: The Ecology of Sustainable Food systems*. Second edition. Boca Raton FL. Taylor and Francis group LLC

Gliessman, S. R. (2015). *Agroecology: The Ecology of Sustainable Food systems*. Third edition. Boca Raton FL. Taylor and Francis group LLC

Gliessman, S. R. (2016) Transforming food systems with agroecology. *Agroecology and sustainable food systems*. Vol 40, pp. 187-189

Higgins, V., Dibden, J., & Cocklin, C. (2008) Building alternative agri-food networks: Certification, embeddedness and agri-environmental governance. *Journal of Rural Studies*, vol. 24, pp. 15-27.

Hill, S. (1998) Redesign Agroecosystems for environmental Sustainability: A deep Systems approach. *Systems research and behavioral science*. Vol 15, pp. 391-402.

Hochreiter, C (2011). *Certified with trust and solidarity? Attitude, benefits and challenges of organic farmers in participatory gurarantee systems, Cacahoatán, Mexico*. University of Natural Resources and Life Sciences Vienna. Department of Sustainable Agricultural Systems, Division of Organic Farming.

IAASTD. (2009). *Agriculture at a Crossroads*. Executive summary report of the synthesis report of the IAASTD, International Assessment of Agricultural Knowledge, Science and Technology for Development. Washington DC: Island Press.

Idescat (2016) Indicadors de demografía i qualitat de vida. Xifres de població. Available at: http://www.idescat.cat/economia/inec?st=3&tema=xifpo [2016-11-05]

Idescat (2016a) *Indicadors de la Unió Europea, Macromagnituds. Valor Afegit Brut. Per sectors. 2015.* Available at: http://www.idescat.cat/economia/inec?tc=3&id=8152 [2016-1105]

Idescat (2016b) European Union indicators, Macromagnitudes. Gross value added. By sector. 2015. Available at: http://www.idescat.cat/economia/inec?tc=3&id=8152&lang=en [2016-1105]

Idescat (2016c) Indicadors d'estructura económica. Població ocupada. Per sectors d'activitat i sexe. Available at: http://www.idescat.cat/economia/inec?tc=3&id=5703 [2016-11-05]

Idescat (2016d) *Vallès oriental*. Available at: http://www.idescat.cat/emex/?id=41#h1fe0fffff [2016-10-06]

Idescat (2016e). *Osona*. Available at: www.idescat.cat/emex/?id=24#h1fe0fffff [2016-10-06]

IFOAM, 2014. Global comparative study on interactions between social processes and Participatory Guarantee Systems. Germany.

Ilbery, B., Morris, C., Buller, H., Maye, D., Kneafsey, M. (2005) Product, Process and Place: An examination of food marketing and labelling schemes in Europe and North America. *European Urban and Regional Studies*. Vol, 12:2, pp. 116-132

IPES-Food. (2016). *From uniformity to diversity: a paradigm shift from industrial agriculture to diversified agroecological systems.* International Panel of Experts on Sustainable Food systems.

ISEAL (2013) *Principles for credible and Effective Sustainability standards systems. ISEAL credibility principles*. ISEAL alliance.

Knudsen, M. T., Halberg, N., Olesen, J.E., Byrne, J., Iyer, V. & Toly, N (2006). Global trends in agriculture and food systems. In: Halberg, N. Alrøe, H.F., Knudsen, M. T. & Kristensen, E.S. (eds) *Global development of organic agriculture: Challenges and Prospects*, Oxfordshire: CAB international, pp. 1-48.

Koos, S. (2011) Varieties of Environmental Labelling, Market Structures, and Sustainable Consumption across Europe: A Comparative Analysis of Organizational and Market Supply Determinants of Environmental- Labelled Goods. *Journal of Consumer Policy*. Vol 34, pp. 127-151

La Xarxeta (2016a) *La Xarxeta*. Available at: http://www.pagesosagroecologics.com/ [201606-09]

La Xarxeta (2016 b) *Què entenem per Agroecologia*. Available at: http://www.pagesosagroecologics.com/queentenemperagroecologia [2016-06-08]

La Xarxeta (2016c) *Què és?.* Available at: http://www.pagesosagroecologics.com/quees [2016-06-09]

La Xarxeta (2016d) *Comissions de treball.* Available at: http://www.pagesosagroecologics.com/comissionsdetreball [2016-06-09]

La Xarxeta (2016e) *Com funciona?* Available at: http://www.pagesosagroecologics.com/comfunciona [2016-06-09]

La Xarxeta (2016f) *Característiques i estructura de la Xarxeta.* Available at: http://www.pagesosagroecologics.com/caracteristiquesiestructuradelaxarxeta [2016-06-10]

La Xarxeta (2016g) *Comissió de control I coordinació.* Available at: http://www.pagesosagroecologics.com/comissionsdetreball [2016-03-03]

La Xarxeta (2016h) *Objectius*. Available at: http://www.pagesosagroecologics.com/objectius [2016-06-10]

La Xarxeta (2016i) *Comunicació i transparencia.* Available at: http://www.pagesosagroecologics.com/comunicacioitransparencia [2016-06-10]

La Xarxeta (2016j) *Maneig de la Fertilitat*. Available at: http://www.pagesosagroecologics.com/maneigdelafertilitat [2016-10-02]

La Xarxeta, (2016k) *Maneig de cultius i material vegetal*. Available at: http://www.pagesosagroecologics.com/maneigdecultiusimaterialvegetal [2016-10-02]

La Xarxeta (2016l) *Gestió de l'Aigua*. Available at: http://www.pagesosagroecologics.com/gestiodel'aigua [2016-10-02]

La Xarxeta (2016m) *Plagues i Malalties*. Available at: http://www.pagesosagroecologics.com/plaguesimalalties [2016-10-02]

La Xarxeta (2016n) *Maneig d'Adventícies*. Available at: http://www.pagesosagroecologics.com/maneigd'adventicies [2016-10-02]

La Xarxeta (2016o) *Collita i Emmagatzematge*. Available at: http://www.pagesosagroecologics.com/collitaiemmagatzematge [2016-10-02]

La Xarxeta (2016p) *Residus*. Available at: http://www.pagesosagroecologics.com/residus [2016-10-02]

La Xarxeta (2016q) *Maquinaria*. Available at: http://www.pagesosagroecologics.com/maquinaria [2016-10-02]

La Xarxeta (2016r) *Producció*. Available at: http://pagesosagroecologics.com/produccio [2016-10-02]

La Xarxeta (2016s) *Comercialització i Distribució*. Available at: http://www.pagesosagroecologics.com/comercialitzacioidistribucio [2016-10-02]

La Xarxeta (2016t) *Organització, Règim Legal i Situació Laboral*. Available at: http://www.pagesosagroecologics.com/organitzaci%C3%B3,r%C3%A8gimlegalisituaci%C3%B3laboral [2016-10-02]

La Xarxeta (2016u) *Acció cap enfora, Divulgació*. Available at: http://www.pagesosagroecologics.com/acci%C3%B3capenfora,divulgaci%C3%B3 [2016-1002]

La Xarxeta (2016v*). Assamblea de la Xarxeta*. Available at: ww.pagesosagroecologics.com/assembleadelaxarxeta [2016-10-02]

Marchand, F., L. Debruyne, L. Triste, C. Gerrard, S. Padel, and L. Lauwers. (2014). Key characteristics for tool choice in indicator-based sustainability assessment at farm level. *Ecology and Society, vol* 19**:**3, pp 46-56

May, C. (2008) *PGS Guidelines, how Participatory Guarantee Systems can develop and function*. Germany: IFOAM.

Mebratu, D. (1998) Sustainability and Sustainable development: Historical and conceptual review. Environmental Impact assessment review. Vol 18, pp.493-520.

Melo, C. J. & Wolf, S. A. (2005). Empirical assessment of eco-certification. Organization & Environment. Vol 18:3, pp. 287-317.

Midgley, G. (2000). *Systemic intervention: philosophy, methodology, and practice*. New York: Kluwer Academic/Plenum Publishers.

Moschitz, H. & Stolze, M. (2009) Organic farming policy networks in Europe: Context, actors and variation. *Food policy*. Vol, 34, pp. 258-264

Moya Gallego, A. (2009). *La Experiencia colectiva de Agricultores "La Xarxeta de Pagesos Agroecològics de Catalunya". Una Mirada a través de la construcción de su SPG.* Universidad Internacional de Andalucia.

Nature et Progrés (2016) Qui sommes- nous? Available at: http://www.natureetprogres.org/nature_et_progres/natureetprogres.html [2016-11-05]

Nelson, E., Gómez Tovar, L., Gueguen, E., Humphries, S., Landman, K. & Schwentesius Rinderman, R (2015) Participatory guarantee systems and the re-imagining of Mexico's organic sector. *Agriculture and Human Values*. Vol 33:2, pp 373-388

Nousiainen, M., Pylkkänen, P., Saunders, F., Seppänen, L. & Vesala, K. M. (2009) Are alternative food systems socially sustainable? A case study from Finland. *Journal of Sustainable Agriculture.* Vol 33:5, pp 566-594

Peix i Massip, J. (2008) *Catalunya, primer cluster regional agroalimentari d'Europa*. Documents de treball, 5. Generalitat de Catalunya. Departament d'agricultura alimentació i acció rural.

Pomar, León, A. & Tendero Acin, G. (2015) *Ja volem el pa sencer. Respostes a la pobresa alimentària en clau de Sobirania Alimentària.* Aliança per la Sobirania Alimentària de Catalunya.

Prakash, A. & Potoski, M. (2006) *The voluntary environmentalists. Green clubs, ISO 14001, and voluntary environmental regulations.* Cambridge: Cambridge university Press

Radomsky, G. F. W. & Leal, O. F. (2015) Ecolabeling as a Sustainability strategy for smallholder farming? The emergence of participatory certification systems in Brazil. *Journal of Sustainable Development*. Vol 8:6, pp 196-207

Renting, H., Marsden, T. K., & Banks, J. (2003) Understanding alternative food networks: exploring the role of short food supply chains in rural development. *Environment and Planning A*, vol 35, pp 393-411

Schader, C., Grenz, J., Meier, M. S. & Stolze, M. (2014) Scope and precision of sustainability assessment approaches to food systems. Ecology and Society. Vol 19:3.

Segarra Blasco, A. & Costas, A. (2014) *La indústria agroalimetària catalana: una perspectiva empresarial.* Informes fundació Catalunya Europa 03/14. Fundació catalunya europa.

Tallontire, A., Nelson, V., Dixon, J. & Benton, T. G. (2012) *A review of the literature and knowledge of standards and certification systems in agricultural production and farming systems*. NRI working paper series on sustainability standards, 2012:2.

Taylor, G.R. (2005). *Integrating Quantitative and Qualitative Methods in Research*. University Press of America

Torremocha, E. (2011) *Sistemas participativos de garantía. Una herramienta clave para la soberanía alimentaria*. Revista soberanía alimentaria, biodiversidad y culturas & Mundubat

Torremocha, E. (2012). Los sistemas participativos de garantía. Herramientas de definición de estrategias agroecologicas. *Agroecología*, vol 6, pp.89-96.

Tregear, A (2011) Progressing knowledge in alternative and local food networks: Critical reflections and a research agenda. *Journal of rural studies*. Vol 27, pp. 419-430.

Valls i Ribas, E. (2006) El mercat local i els circuits curts de comercialització.

Venn, L., Kneafsey, M., Holloway, L., Cox, R., Dowler, E. & Tuomainen, H. (2006)
Researching European 'alternative' food networks: some methodological considerations. *Area*. Vol 38:3, pp.248-258

Wezel, A., Bellon, S., Doré, T., Francis, C., Vallod, D. & David, C. (2009). Agroecology as a science, a movement and a practice. A review. *Agronomy for sustainable development*. Vol 29, pp. 503-515

Wezel, A., Casagrande, M., Celette, F., Vian, J. F., Ferrer, A & Peigné, F (2014) Agroecological practices for sustainable agriculture. A review. *Agronomy for sustainable development.* Vol 34:1, pp. 1-20

Wibbelmann, M., Schmutz, U., Wright, J., Udall, D., Rayns, F., Kneafsey, M., Trenchard, L.,

Bennett, J. and Lennartsson, M. (2013) *Mainstreaming Agroecology: Implications for Global Food and Farming Systems*. Centre for Agroecology and Food Security Discussion Paper. Coventry: Centre for Agroecology and Food Security.

Willer, H. & Lernoud, J. (Eds.) (2015) *The world of organic agriculture. Statistics and emerging trends 2015*. Organics International, Bonn. Research institute of organic agriculture (FiBL), Frick, and IFOAM.

APPENDICES

Appendix 1: Interview guide

INTERVIEW GUIDE Farmers

date:

Background:

Farm ha.

How long you have been farming? How long you have been farming organic?

Through which channels do you sell your products?

Why you produce organic?

How many people works in the Enterprise? Age? Studies?

G O O D G O V E R N A N C E

Corporate ethics

What is the mission of your enterprise? Where is the mission of your enterprise reflected?

Do you have any policy that guide your decisions according to long – term effects on sustainability?

Accountability:

Do you use any auditing for sustainability reporting? When was the last time you pass it?

Do you independently evaluate your farm performance against mission? Do you have any documents?

Do you have any policy stating how the information is made accessible to stakeholders?

Participation:

Who are your stakeholders?

How you engage with them?

Can you identify potential barriers to stakeholder participation? How you overcome those barriers?

How stakeholder participate? Do their impact affect decision making and how you transmit it to them? Can you give an example?

Rule of law

How do you keep up with new legislation? How is it monitored? How is it transmitted to stakeholders?

Have you ever got problems with regulations? How you have solve them? How are these problems now prevented?

Do you belong to any group involved in the improvement of the legal and regulatory framework? Do you consult other affected stakeholders?

Holistic management:

Do you have a sustainability plan? How the plan has driven specific decisions? What are their outcomes?

How do you measure your business success? Do you account for direct and indirect impacts on the economy, society and environment?

E N V I R O N M E N T A L I N T E G R I T Y

Atmosphere

Have you set a target to reduce GHG emissions and air pollutants on your operations?

Can you identify emission sites?

Which activities from the list have you implemented?

Water

Have you set a target to reduce water consumption and water withdrawals and improve water quality?

Can you identify places where water pollution may exist?

Which activities from the list have you implemented?

Land

Do you have a plan describing steps of conserving or enhancing soil health and rehabilitation of degraded soils?

What soil quality problems do you face?

What activities and practices have you implemented which help you to increase the quality and fertility of soils?

Which effective soil transformation techniques have you implemented or regularly practice in the operations?

Biodiversity

Do you have a biodiversity plan describing how to conserve or rehabilitate the habitats of the farm and populations?

What activities and practices have you implemented from the list?

How many different species and varieties do you cultivate?

Do you save your own seeds?

Materials and energy

Have you set a target to increase share of renewable energy and reduce total energy usage?

What practices and activities from the list have you implemented?

Have you set a target in reducing the generation of waste and its hazardousness?

What practices and activities have you implemented that effectively reduce waste generation in the enterprise operation?

E C O N O M I C R E S I L I E N C E

Investment

In which activities have you invested during the last 5 years to improve and monitor sustainability?

How do you thing that your investments contributed to address or meet community needs?

Do you have a business plan?

Profitability

Does the revenue that you retain exceed expenses during the last five years? What was your net income for the last year?

What is the cost of your total product sold? Do you know what is your break-even point?

Have you calculate a break-even point to negotiate with you buyers selling price in your contracts?

Vulnerability

Which actions or mechanism have you implemented to reduce the negative impact of the risk of reduction of target volume of production and quality standards?

Do you produce more than one product, specie or variety of plant for income generation?

What actions or mechanisms have you put in place to reduce risk of having input supply shortages, including maintaining ongoing business relationships with suppliers?

What share of relationships has remained ongoing over the last five years?

What share of inputs come from the leading supplier?

Which actions and mechanisms have put in pace to ensure a diversified and consolidated income structure from product sales or from service provider?

Has the enterprise generated a positive cash flow in the last five years?

Does the enterprise have access to formal or informal financial resources to withstand liquidity crises?

Do you have a plan to reduce and adapt against risks that could potentially threaten the business?

Local Economy

Is the enterprise hiring regional employees?

Does the enterprise pay applicable taxes?

Do you procured from local suppliers?

S O C I A L W E L L – B E I N G

Decent livelihood

Do you consider that you have time for family, rest and culture?

Do all your employees earn a living wage?

Do you have opportunities to increase skills and knowledge necessary to undertake current and future tasks?

Do you consider that do you have access to the equipment capital and knowledge necessary to make a decent livelihood feasible?

Fair Trading Practices

How your buyers recognize and support fair pricing and fair contracts and agreements?

Labour Rights

Do you have written contracts with the people working in the farm?

Equity

Do you follow any policy written or not on who to hire?

Are women in the enterprise supported during maternity?

How do you try to accommodate different levels of ability and disability, age… in the enterprise?

Human Safety And Health

Does the enterprise provide training in health and safety for 100% of employees?

What is the protocol if someone gets injured?

G E N E R A L

Which are the main challenges you face? Environmental, governance, economic and social

Which are the main obstacles?

C E R T I F I C A C I O N S

How do you think that the belonging of a certification enhance your sustainability?

What are the main supports that you receive from the certification?

Appendix 2: SAFA

SAFA is divided in four dimensions: Good Governance, Environmental Integrity, Economic Resilience and Social Well-being. These four dimensions are constructed by themes and those theme by subthemes. The rate of each subtheme is calculated through indictors. In this document the themes, subthemes and indicators are contextualized. Explaining which are considered which not and why.

It is important to understand that the evaluated farms are organic and use small, short commercialization channels. Therefore, some rating has been modified in order to provide a differentiation according to the contexts in which they are embedded.

Just one member of the farm was interviewed.

G_GOOD GOVERNANCE:

G1_CORPORATE ETHICS: This theme gives an idea on how entrenched is sustainability in the fabric of the farm. Its two subthemes are Mission statement and Due diligence.

> **G11_Mission Statement**: It is developed around the sustainability concept. How it is pursued by the farm and If it is clearly and widely understood. It will be calculated using the indicators **G111** and **G112**.

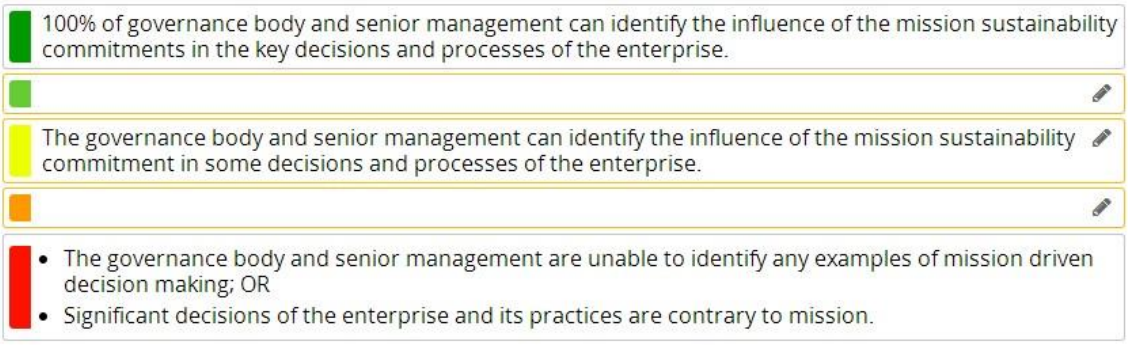
G111_Mission Explicitness: "Is the mission of the enterprise articulated in all enterprise reporting and understood by all employees or members?"

100% of employees, or members of a group of small-scale producers, are able to explain the enterprise's mission and identify how it influences the work which they do.
The producers can articulate the mission which cover all aspects of sustainability. However, they are not able to identify fully how it influences the work which they do.
The producers can articulate a mission which adressses some aspects of sustainability and identify how it influences the work which they do.
The producers can articulate a mission which adresses some aspects of sustainability. However, they are not able to identify fully how it influences the work which they do.
• The enterprise or group of producers has no articulated mission; OR • The mission of the enterprise or group of producers does not address sustainability; OR • The key planning and reporting documents of the enterprise, or undocumented rituals of the group of producers, have no evidence of sustainability principles.

Measurement:

Farmers were directly asked about the mission of their enterprise. Furthermore, information was complemented with secondary data (blogs, Social networks) When the enterprise has written documents about their mission is assumed that all members understand it. There was no capacity to access enterprises' documents. Information gathered was contrasted with the indicator.

G112_Mission Driven: "Is the enterprises' mission evident in codes and policies, and can the governance body demonstrate the impact of its mission on developing policy and practice?"



Measurement:

Available policies were checked, processes inquired through direct questioning. Nevertheless, access to documents was not possible. Information gathered was contrasted with the indicator.

G12_Due Diligence: It is based in the concept of risk management. It considers also the effects that farms can have beyond their gates and if stakeholders are informed about them. It will be calculated by using the **G121** indicator.

G121_Due Diligence: "Does the enterprise have a clear policy for impact assessment, appropriate tools for assessment and is it able to show that these are being used to inform decisions which will have long term impacts on area of sustainability?"

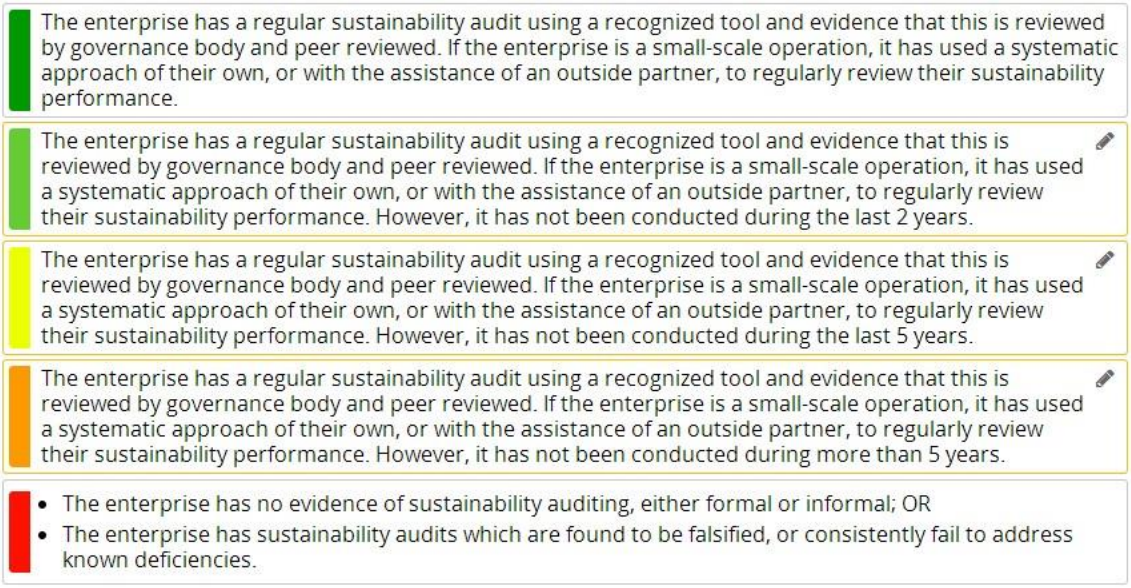
Measurement:

Farmers were asked about how they take decisions and consider the risk beyond them. Information gathered was contrasted with the indicator.

G2_ACCOUNTABILITY: The theme establishes the commitment of the farm to disclose information about farm performance to stakeholders. It has a relation with monitoring and evaluation. It will be calculated through three subthemes: Holistic audit, Responsibility and Transparency.

G21_Holistic Audit: the subtheme considers monitoring and evaluation of sustainability in all dimensions. It will be calculated using the indicator **G211**

G211_Holistic Audits: "Does the enterprise use an internationally recognized framework for sustainability reporting such as the global Reporting Initiative, or is social auditing being used in the enterprise?"



Measurement:

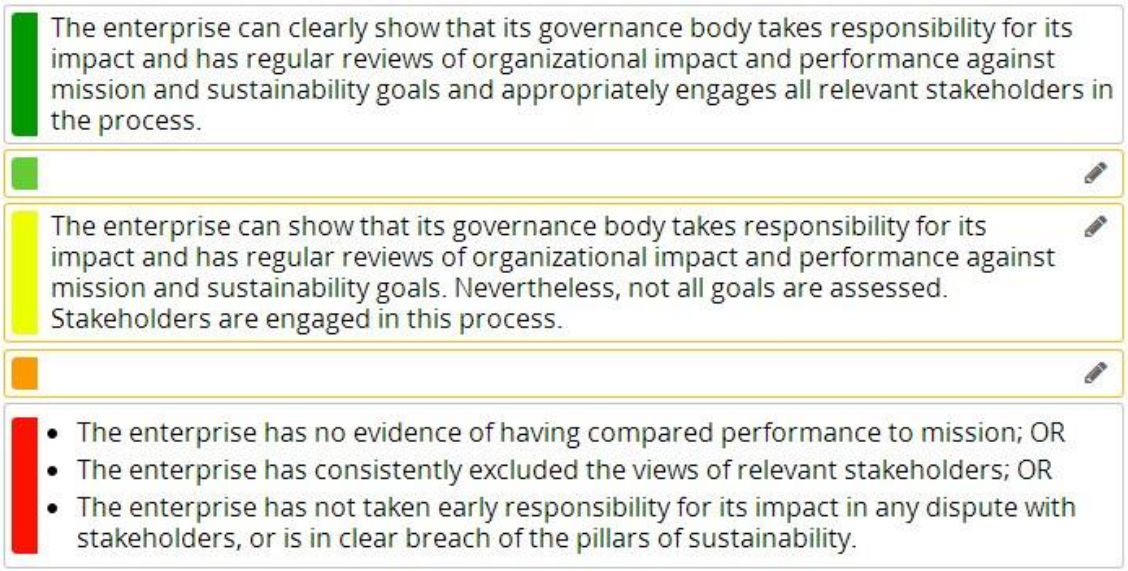
The focus on the calculation of this indicator is the existence of reports of the governance body from external or internal auditors, reports by the governance body of the audit in key organizational documents or processes for gathering data. Information gathered was contrasted with the indicator.

Farmers were directly asked about which different audits receive.

The CCPAE is not considered a holistic audit.

G22_Responsibility: It rates the monitoring and evaluation practices by farms. It considers that farms should evaluate their performance against sustainability. It will be calculated by the indicator **G221**

G221 Responsibility: "Can the enterprise show, through governance papers or internal dialogue, that performance against mission is regularly evaluated with appropriate stakeholder input?"



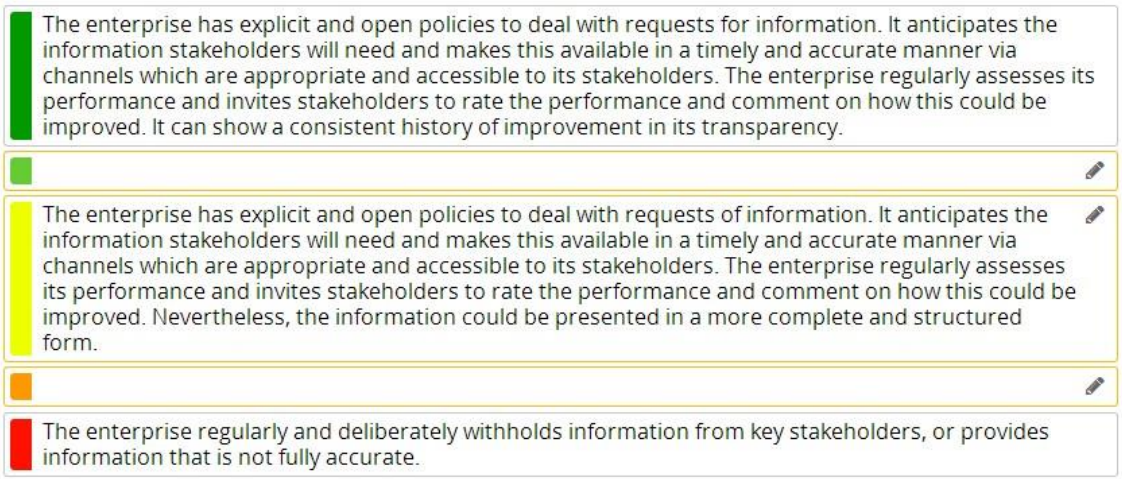
Measurement:

The presence of discussions about sustainability are a first step. Nevertheless, according to the Catalan context is not considered enough. The capacity to write this in documents to inform organizational changes is required. The description of protocols followed to measure sustainability against mission are considered. Information gathered was contrasted with the indicator.

Farmers were asked about how the farm works and in which documents collects information.

> **G23_Transparency**: This subtheme contemplates the necessity to make the information available and accessible in any case. It will be calculated by the indicator **G231**.

G231_Transparency: "Does the enterprise have a policy which requires management to report on how policies, procedures, decisions and decision making processes are made accessible to stakeholders?"



Measurement:

Farmers were asked about the important aspects are to assess if the enterprise can explain how the transparency policy is applied and in which cases. The capacity of the enterprise to describe

examples is important. The fact that you can access to information is a plus. Finally, the explanation of how the information needs of stakeholders are met is important. Information gathered was contrasted with the indicator.

G3_PARTICIPATION: The involvement of interested parties allows for a collective decision making which it is considered to enhance democracy, produce better outcomes and increase trust through the exchange of perspectives. It will be calculated trough one subtheme: Stakeholder dialogue. The other subthemes contemplated here as grievance procedures and conflict resolution have been eliminated.

> **G31_Stakeholder Dialogue**: The purpose of this subtheme is to give an idea about the engagement of different stakeholders in the decision making. The active or passive approach through this involvement is also contemplated. It is calculated by the indicators **G311**, **G312**, **G313**, **G314**. It is important to consider that stakeholders are considered the people affected by the activities of the enterprise. Furthermore, the accuracy of this indicator can be discussed because no sample of stakeholders have been done.

G311_Stakeholder Identification: "Can the enterprise identify all material stakeholders and describe the process by which they were identified?"

Measurement:

This indicator was calculated in the following way:

First, during the interviews farmers where asked to supply a list of stakeholders and an explanation on how these stakeholders were identified. Second, the results collected in the 9 different farms under study allowed to develop a list with all the stakeholder's groups identified. Third, other stakeholder's groups that emerged during the rest of the interview but were not identified where added to the list. Fourth, just the common stakeholders were considered to reduce singularities due to market channels, location or land tenancy. Fifth, a table was developed with the stakeholders (rows) and farms (columns). Identification was

marked with a 1 and non-identification with 0. The result was translated into a percentage.[22] Information gathered was contrasted with the indicator.

The common stakeholders considered were consumers, workers, other farmers, suppliers, organizations, distribution companies, CCPAE and the local administration.

G312_Stakeholder Engagement: "Does the enterprise use appropriate mechanisms to engage with each group of stakeholders?

The enterprise has a clear commitment to stakeholder engagement and participation when it has achieved satisfactory engagement with 80% of identified stakeholders, including all vulnerable stakeholders and those unable to claim their rights.
The enterprise has a good commitment to stakeholder engagement and participation when it has achieved satisfactory engagement with 60 to 80% of identified stakeholders, including all vulnerable stakeholders and those unable to claim their rights.
The enterprise has a moderate commitment to stakeholder engagement and participation when it has achieved satisfactory engagement with 40 to 60% of identified stakeholders, including all vulnerable stakeholders and those unable to claim their rights.
The enterprise has a limited commitment to stakeholder engagement and participation when it has achieved satisfactory engagement with 30 to 40% of identified stakeholders, including all vulnerable stakeholders and those unable to claim their rights.
• The enterprise is unable or unwilling to describe the process used for engaging with stakeholders or the process of engagement or excludes the most vulnerable and those unable to claim their rights; OR • Less than 30% of stakeholders, or less than 50% of stakeholders who are among the most vulnerable and those unable to claim their rights, have been engaged.

Measurement:

This indicator was calculated by considering the farm identified stakeholders. The same table as indicator G311_Stakeholder Identification was used, if effective engagement was recognized, was marked as 1 and non-engagement as 0. The result was translated into percentages.

G313_Engagement Barriers: "Is the enterprise aware of, and addresses barriers to participation for less powerful stakeholders?

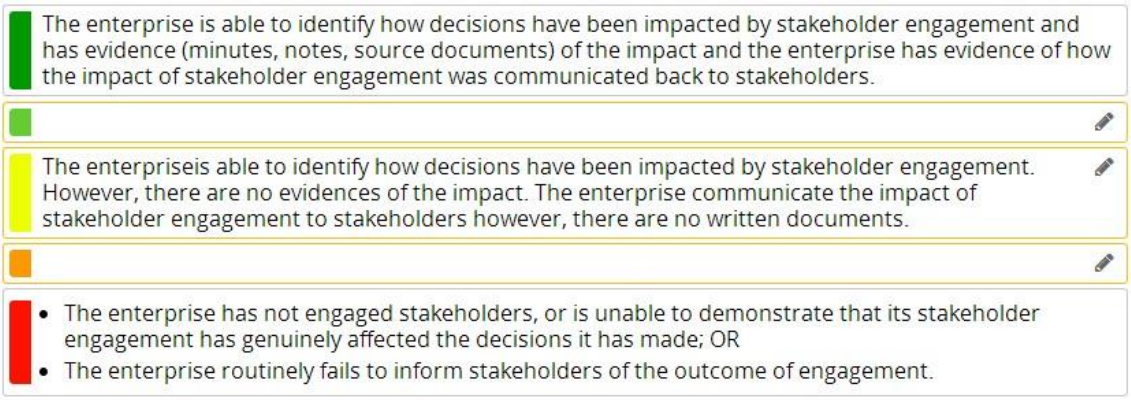
The enterprise has a clear commitment to stakeholder engagement and participation when it is able to identify potential barriers to engagement for stakeholders, has developed strategies to overcome these barriers, and has evidence of this being successfully employed in 80% of cases. It has process improvement plans developed or in development for the remainder.
The enterprise has a good commitment to stakeholder engagement and participation when it is able to identify potential barriers to engagement for stakeholders, has developed strategies to overcome these barriers, and has evidence of this being succesfully employed in 80% of cases.
The enterprise has a moderate commitment to stakeholder engagement and participation when it is able to identify potential barriers to engagement for stakeholders, has developed strategies to overcome these barriers, and has evidence of this being succesfully employed for more than 50% of cases. It has process improvement plans developed or in development for the remainder.
The enterprise has a limited commitment to stakeholder engagement and participation when it is able to identify potential barriers to engagement for stakeholders, has developed strategies to overcome these barriers, and has evidence of this being succesfully employed in more than 50% of cases.
• Unexplained failure to identify and act upon more than two barriers; OR • Failure to develop and implement strategies to overcome barriers for more than 50% of identified the barriers.

[22] The table can be found in the justification of indicators section.

Measurement:

Farmers, during the interview, were asked about which engagement barriers they face. The capacity to list barriers and explain the strategies followed to overcome those barriers are enough to consider that farmers are involved in improving stakeholder engagement. The farms under study are small. Therefore, these barriers have been detected in an informal way. Sample of stakeholders was not done.

G314_Effective Participation: "Can the enterprise describe actual stakeholder participation (including of "least-powerful" stakeholders), its impact on their decision making and how this impact was communicated to stakeholders?



Measurement:

During the interview farmers were asked about how stakeholders have influenced the decisions of the enterprise and if feedback is provided to stakeholders on how they have affected the decisions of the enterprise.

> **Grievance Procedures**: The idea of this subtheme is to assess the function of grievance procedures if in place. Nevertheless, the incapacity to canvas other stakeholders due to the short time made difficult to assess this subtheme in an objective way. Therefore, was eliminated to reduce possible bias.
>
> **Conflict Resolution**: The subtheme refers to conflict of interest among different stakeholders. Therefore, the incapacity to canvas other stakeholders and the short time did not allow for the assessment of this subtheme.

Rule of Law: This theme was not considered in this assessment. Rule of law assesses the compliance with legislation. It is calculated through four subthemes: Legitimacy, Remedy, Restoration and Prevention, Civic Responsibility and Resource Appropriation. The noncalculation of these themes responded to the assumption done about the 100% compliance with existing regulations mandatory or voluntary.

> **Legitimacy**: The subtheme assesses if the enterprise is compliant with all applicable laws. The non-calculation of this subtheme comes under the assumption done about the 100% compliance with existing regulations mandatory or voluntary.
>
> **Remedy, Restoration and Prevention:** In case of any legal infringements it is assumed that the Enterprise will conduct the activities required by law to solve the problem.

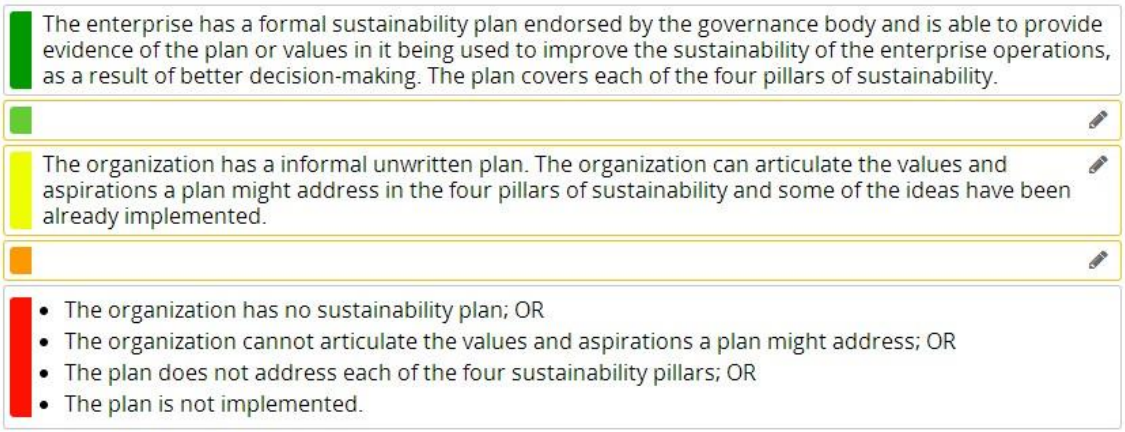
Civic Responsibility: The topic is of interest but the supporting of legal and regulatory improvements it is assumed by their belonging to the PGS or CCPAE.

Resource Appropriation: The rights of communities were not reduced by the activities of the farms analyzed.

G5_HOLISTIC MANAGEMENT: This theme puts together all the other subthemes by considering how the farm management and structure aim at sustainable development. It refers to the strategy of the farm. It is calculated through Sustainability Management Plan and Full-Cost Accounting subthemes.

G51_Sustainability Management Plan: It provides a systemic view and acknowledges the trade-offs between dimensions. It will be calculated through the **G511** indicator.

G511_Sustainability Management Plan: "Does the enterprise have a sustainability plan, endorsed by its governing body (or producers' association members or contractors), which provides a holistic view of the enterprise sustainability and covers each of the environmental, economic, social and governance dimensions, including references to mission and demonstration of progress against the plan or how the plan has driven specific decisions and their outcomes?"



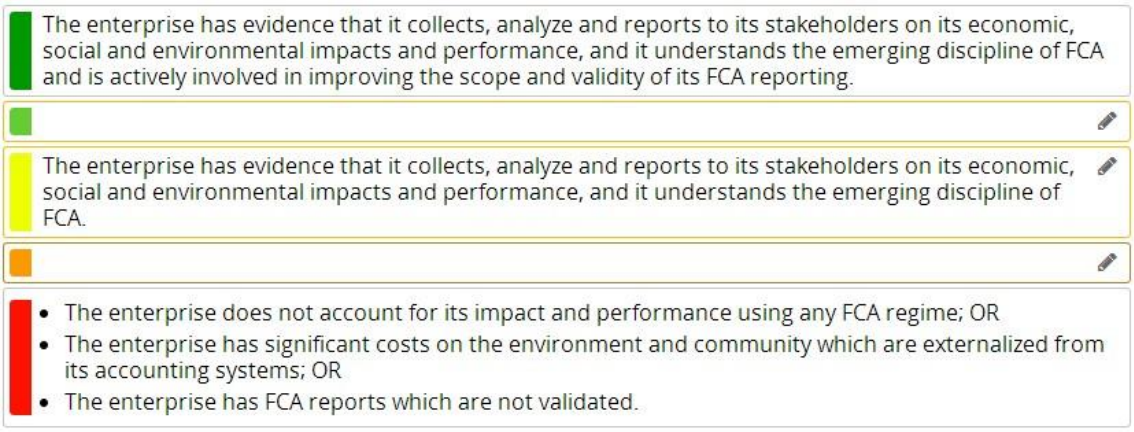
Measurement:

It is understood that "small-scale producers may not have a formal plan but may set individual goals for sustainability informally." Therefore, to calculate this indicator, farmers were asked about:

If the enterprise has any formal sustainability plan, other documents developing a similar job or an informal sustainability plan and its characteristics. The information gathered was contrasted with the indicator.

G52_Full-cost accounting: It considers that business success should account for direct and indirect impacts and externalities produced. It will be calculated through the **G521** indicator.

G521_Full-cost accounting: "Is the business success of the enterprise measured and reported to stakeholders taking into account direct and indirect impacts on the economy, society and physical environment?"



Measurement:

The indicator was measured by direct questioning about how they measure the success of the enterprise in order to elucidate a possible analysis of the environmental, social and economic impacts of the enterprise and how farmers do that.

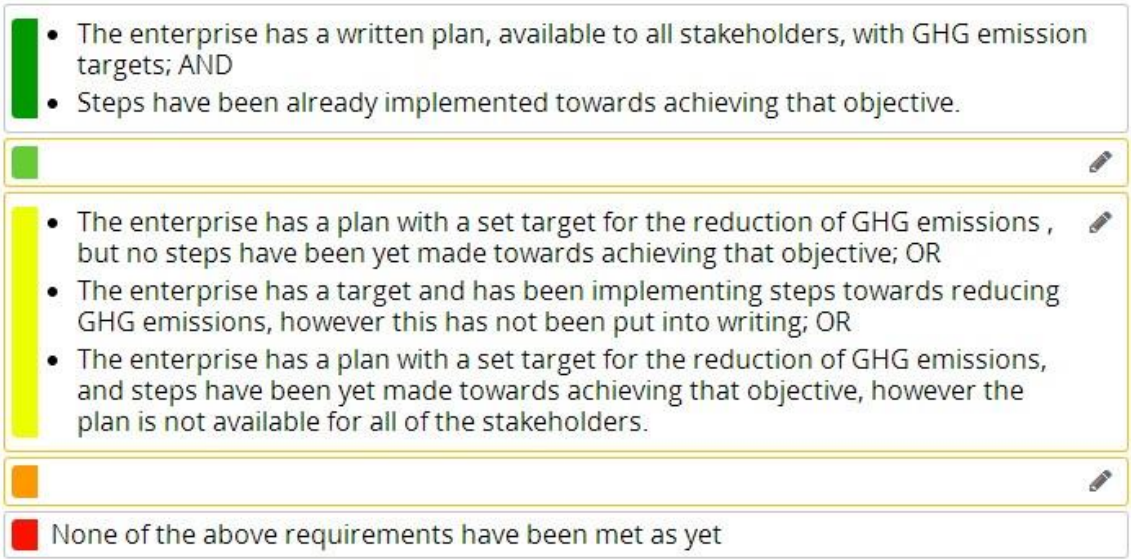
The relevance of this indicator is low due to the incapacity of the researcher to check governance documents.

E_ENVIRONMENTAL INTEGRITY:

E1_ATMOSPHERE: The theme can be reduced to the idea of preservation of clean air as a main objective to assess. It is divided in Greenhouse Gases and Air Quality. Therefore, the indicator requires an identification of emission sites.

> **E11_Greenhouse Gases**: It assesses how the emissions of GHG are contained. It is calculated through the indicators **E111** and **E112**.

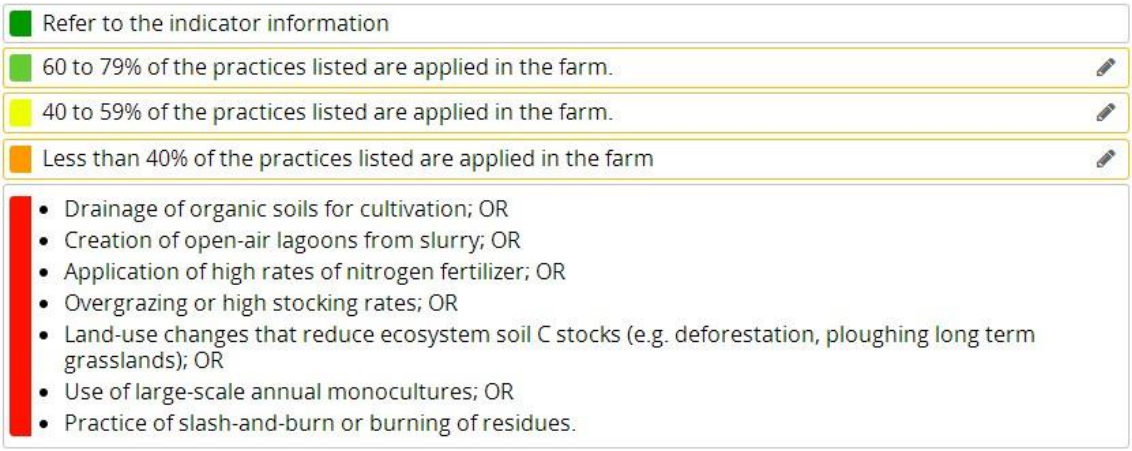
E111_GHG Reduction Target: "Has the enterprise set a target in reducing GHG emissions?"



Measurement:

The indicator was assessed through direct questioning. The plan which should be available to stakeholders should contain: "a target for the reduction of GHG emissions with exact steps and the expected time-frame. The plan should include direct and indirect emissions."

E112_GHG Mitigation Practices: "Which activities and practices has the enterprise implemented that have effectively reduced GHG emissions?"



Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. Other practices were assessed by direct observation. The practices assessed were as follows:

Best practices:

1. Soil fertility management with organic materials and improved fertilizer application timing.
2. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.
3. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.
4. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).
5. Incorporation of residues
6. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.
7. The efficiency of fixed equipment is maintained, such as refrigerated stores.
8. Use of non-fossil fuel sources of energy.
9. Restoration of degraded lands and/or drained organic soils.
10. Implementation of sound agroforestry practices.

Unacceptable practices:

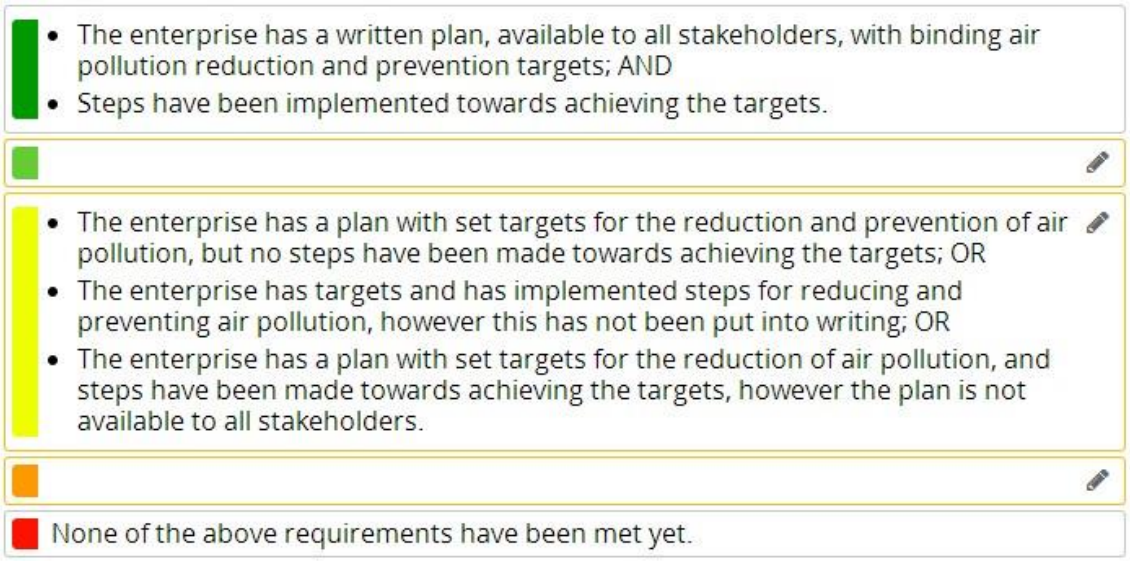
11. Drainage of organic soils for cultivation; OR
12. Application of high rates of nitrogen fertilizer; OR
13. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR
14. Practice of slash and burn or burning of residues.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row is the percentage of best practices applied in reference to all best practices possible. Red numbers represent unacceptable practices. Therefore, a red percentage indicate that one or more unacceptable practices are applied in the farm. Percentages represent different scores of the indicator. It is important to understand that following this method it is assumed that all practices has the same GHG mitigation potential.

E113_GHG Balance (performance indicator): This indicator will not be calculated due to the low time for the study and budget which does not allow for the application of the required tools.

> **E12_Air quality**: It considers how the emissions of pollutants are prevented. It is calculated through the indicators **E121** and **E122**. The indicator E123 will not be considered.

E121_Air Pollution Target: "Has the enterprise set a target in reducing the emission of air pollutants?"

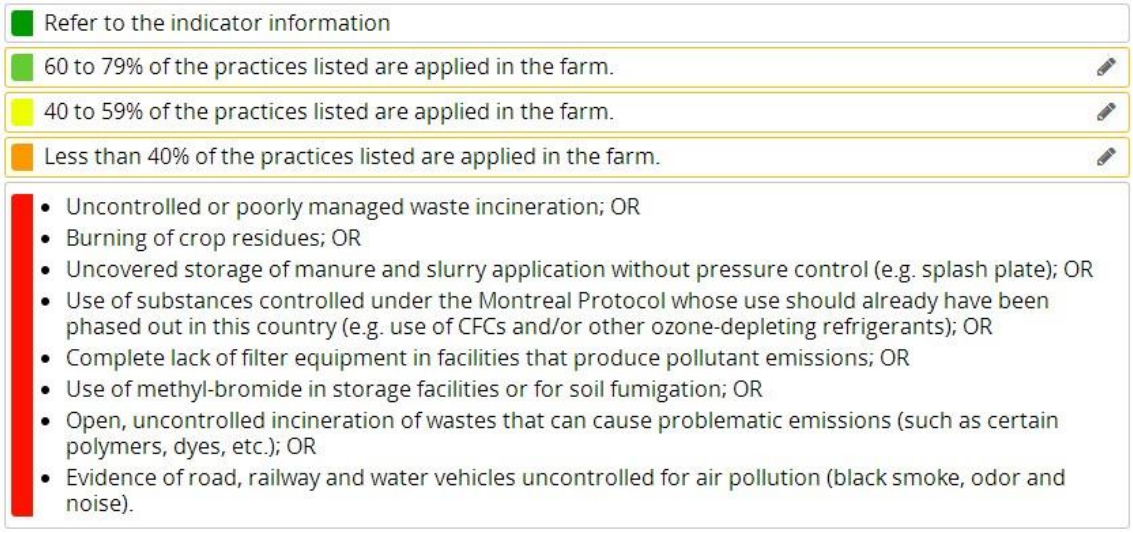


Measurement:

Farmers were asked if they have a "written plan - available to stakeholders- which includes measurable and binding targets for the reduction and prevention of air pollutant emissions, with steps and expected time frame."

Pollutant emissions sites were not screened according to the type of pollutants they can emit.

E122_Air Pollution Prevention Practices: "Which activities and practices has the enterprise implemented that have effectively reduced air pollutants?"



Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. Other practices were assessed by direct observation. No screening of pollutant emissions sites according to the pollutant they can emit was done. The practices assessed were as follows:

Best Practices:

1. Soil fertility management with optimized fertilizer application rates and timing (both within the season and within the day)
2. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

Unacceptable Practices

3. Uncontrolled or poorly managed waste incineration; OR
4. Burning of crop residues;

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row presents the percentage of best practice applied in reference to all best practices possible. Red numbers represent unacceptable practices. Therefore, a red percentage indicate that one or more unacceptable practices are applied in the farm. Percentages represent different scores of the indicator (note that some of the practices collected in the red score level are not considered). It is important to understand that following this method it is assumed that all practices has the same air pollution prevention potential.

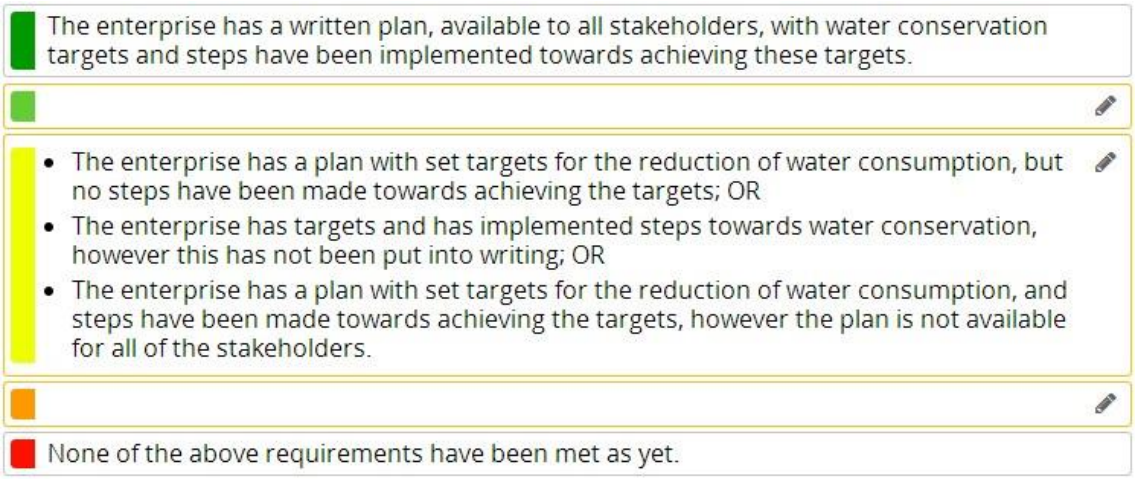
E123_Ambient concentration of Air pollutants (Performance indicator): On the one hand, the size of the enterprise and the organic nature of it make difficult to consider them as polluters which can contribute strongly to increase the air pollution values in the surroundings of the enterprise. On the other hand, if their surroundings were considered we could incur in an unfair comparison because surrounding emission sources could be considered as farms emissions.

Therefore, acknowledging the different situations that we encountered this indicator was not be considered.

E2_WATER: The theme assesses how the activities of the farm aim to maintain a good surface and ground water quality and quantity. The themes which conform the theme are Water Withdrawal and Water Quality. The indicator requires the identification of withdrawal and water pollution sources.

> **E21_Water withdrawal**: It studies how the farm activities are focused in reducing the effect of the farm in natural water cycles and ecosystems. It will be calculated by **E211** and **E212** indicators. The performance indicator E213 is eliminated.

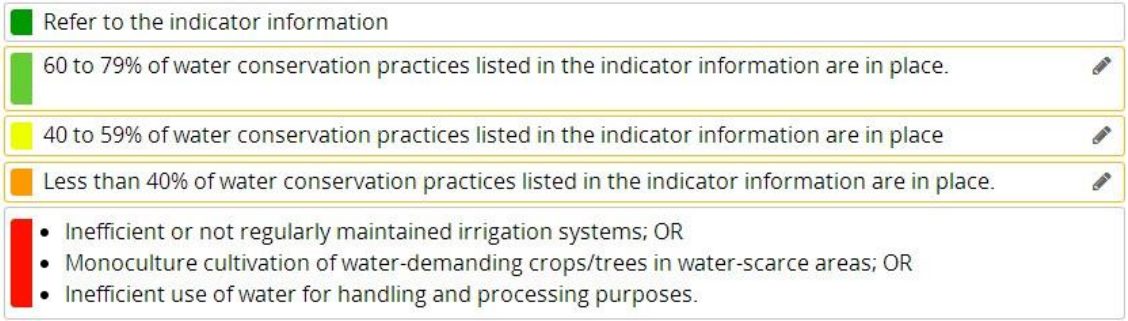
E211_Water Conservation Target_ "Has the enterprise set a target for reducing water consumption or water withdrawals?"



Measurement:

The farmers were asked if they have a "written plan - available to stakeholders- which includes measurable and binding targets for the reduction of water consumption, with steps and expected time-frame."

E212_Water Conservation Practices: "Which activities and practices has the enterprise implemented that have effectively increased the efficiency, or reduced the amount of, the freshwater used in the operation?"



Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices

are applied. Other practices were assessed by direct observation. The practices assessed are as follows:

Best Practices:

1. Mulching and tillage to break pore continuity and reduce water evaporation from soils
2. Water harvesting
3. Minimization of irrigation water, such as by use of efficient irrigation technologies
4. Use of soil moisture and rainfall sensors to optimize irrigation schedules
5. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water
6. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients
7. Wastewater recycling in vegetable cleaning

Unacceptable Practices:

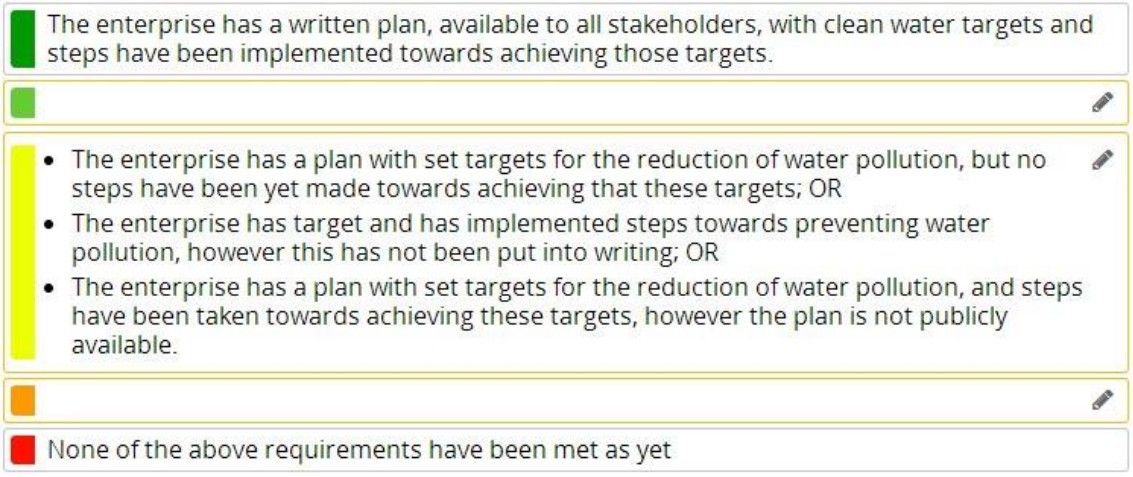
8. Inefficient or not regularly maintained irrigation systems; OR
9. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
10. Inefficient use of water for handling and processing purposes.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row presents the percentage of best practices applied in reference to all best practices possible. Red numbers represent unacceptable practices. Therefore, a red percentage indicate that one or more unacceptable practices are applied in the farm. Percentages represent different scores of the indicator (note that some of the practices collected in the red score level are not considered). It is important to understand that following this method it is assumed that all practices has the same water conservation potential

E213_Ground and Surface Water Withdrawals (Performance indicator): The indicator will not be calculated because the time of the study did not allow for a proper calculation. Furthermore, according to the size of exploitations it will be difficult that farms contribute to water supply problems in the ecosystems or human water users.

> **E22_Water quality:** The subtheme analyzes how the release of water pollutants is prevented and water quality restored. It will be calculated by **E221** and **E222**. The indicators E223 and E224 are not considered.

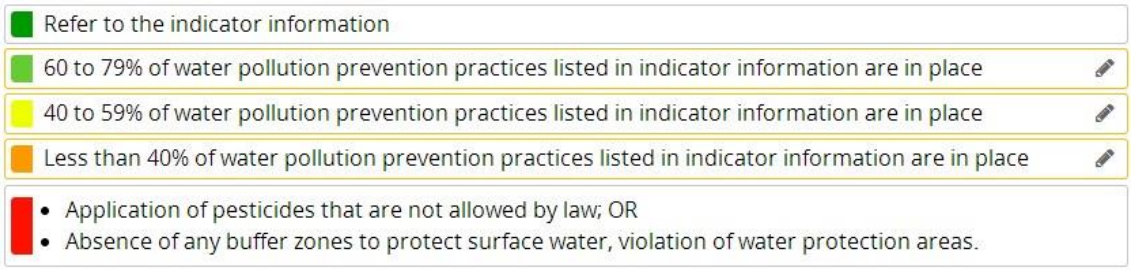
E221_ Clean Water Target: "Has the enterprise set a target for improving the quality of the water affected by the operations?"



Measurement:

The farmers were asked if they have a "written plan - available to stakeholders- which includes measurable and binding targets for the reduction of water pollution, with steps and expected time-frame."

E222_Water Pollution Prevention Practices: "Which activities and practices have been implemented that have effectively reduced or prevented the release of water pollutants?"



Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. Other practices were assessed by direct observation. The practices assessed are as follows:

Best Practices:

1. Use of cover crops, and avoidance of bare fallows
2. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc;
3. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds
4. Adoption of no spray buffer zones
5. Conservation tillage practices
6. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life

7. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips

Unacceptable Practices:

8. Application of pesticides that are not allowed by law; OR
9. Absence of any buffer zones to protect surface water, violation of water protection areas.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row presents the percentage of best practices applied in reference to all best practices possible. Red numbers represent unacceptable practices. Therefore, a red percentage indicate that one or more unacceptable practices are applied in the farm. Percentages represent different scores of the indicator (note that some of the practices collected in the red score level are not considered). It is important to understand that following this method it is assumed that all practices has the same pollution prevention potential.

E223_Concentration of Water Pollutants (performance indicator): The capacities of the farms (small-holder) probably does not allow them to calculate the concentration of water pollutants in their effluents. Furthermore, the time, budget and tools given for the thesis did not permitted to conduct an analysis of water pollutants.

E224_ Waste Water Quality (performance indicator): The indicator will not be calculated. The same reasons than indicator E223 apply.

E3_LAND: The theme studies which activities performed in the farm aim to maintain healthy soil resources. The subthemes establishing the theme are soil quality and land degradation.

> **E31_Soil quality:** This subtheme in this study turn around the practices which help to maintain a proper plant growth and soil health. It will be calculated using the indicator **E311**. The performance indicators E312, E313, E314 and E315 will not be calculated.

E311_Soil improvement practices: "What activities and practices have been implemented that effectively increase the quality and fertility of soils?"

Measurement:

Farmers were asked about which techniques they use in their farm. Nevertheless, differentiation between areas on the farm was not done. Other practices were assessed by direct observation.

Practices assessed were:

1. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.
2. Wise application of mineral fertilizers to improve soil fertility
3. Liming to increase soil pH if acidity is present
4. Better drainage and/or subsoiling to increase nutrient availability and water retention
5. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented by their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row is the percentage of best practices applied in reference to all best practices possible. Percentages represent different scores of the indicator. It is important to understand that by following this method it is assumed that all practices have the same soil improvement potential.

E312_Soil physical structure (performance indicator): The study of soil physical structure requires capacity to visit the farm several times in order to sample diverse areas to achieve significant results. Furthermore, the tools required for its study like a penetrometer are not available. According to these limitations. The indicator was not calculated.

E313_ Soil Chemical Quality (performance indicator): The incapacity to perform soil chemical analysis due to lack of tools for a proper laboratory analysis and time lead the researcher to eliminate this indicator.

E314_Soil Biological Quality (performance indicator): The same reasons stated in the indicator E313 apply for this.

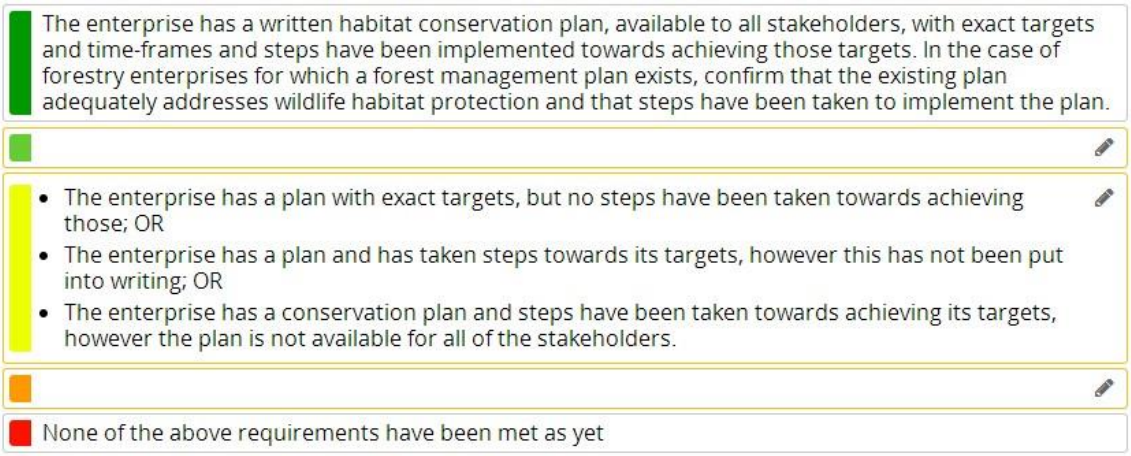
E315_Soil Organic Matter (performance indicator): The same reasons for all other indicators apply.

E32_Land degradation: The similarity among practices stated to achieve a good soil quality and the practices to avoid land degradation sustain the justification for the elimination of this subtheme. Furthermore, the size of the exploitations of organic agriculture, together with the practices it entangles difficulties the presence of land degradation.

E4_BIODIVERSITY: It refers to the diversity of the farm ecosystems, diversity inside those ecosystems and diversity among species. Furthermore, assesses the agricultural diversity.

E41_Ecosystem Diversity: The subtheme studies how ecosystem services are conserved and improved inside the farm. It will be calculated through the indicators **E411** and **E412**. The indicators E413, E414 and E415 will not be considered.

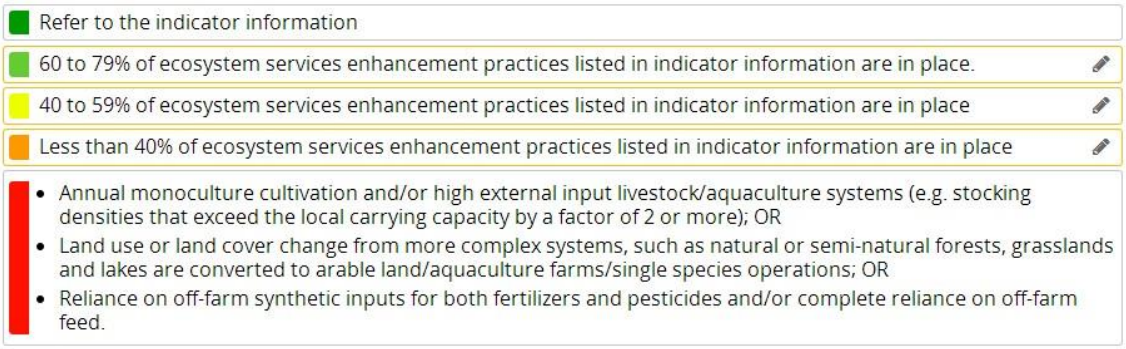
E411_Landscape Habitat Conservation Plan: "Does the enterprise have a plan that describes how to conserve or rehabilitate a diversity of habitats within its sphere of influence?"



Measurement:

The farmers were asked if they have a "written plan - available to stakeholders- which includes measurable and binding targets for habitat conservation and rehabilitation, with steps and expected time-frame."

E412_ Ecosystem Enhancing Practices: "What activities and practices have been implemented that have effectively enhanced the functioning of ecosystem services, as well as the connectivity of ecosystems?"



Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. Other practices were assessed by direct observation. The practices assessed are as follows:

Best Practices:

1. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.
2. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.
3. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

4. Creation and maintenance of habitat networks that facilitate exchange between populations.
5. Longer crop rotations, including nitrogen fixing species
6. Coverage of bare ground and other soil protection measures.

Unacceptable Practices:

7. Annual monoculture cultivation and /or high external input livestock systems; OR
8. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR
9. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row denotes percentages of best practices applied in reference to all best practices possible. Percentages represent different scores of the indicator. It is important to understand that following this method it is assumed that all practices has the same ecosystem enhancing potential.

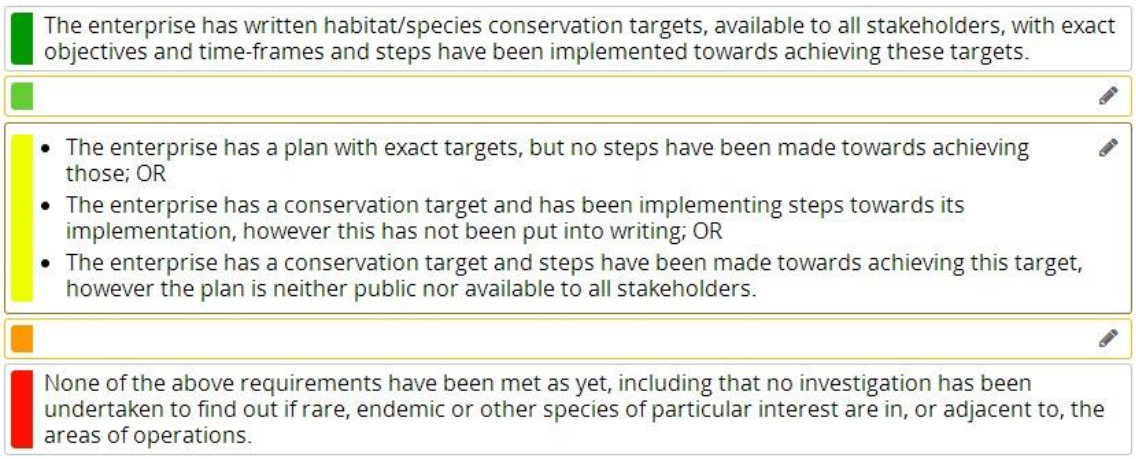
E413_ Structural diversity of Ecosystems (Performance indicator): The calculation of this indicator was possible according to the technical requirements. However, in this case the main limitation was time. The necessity to characterize the natural habitats surrounding the farm was a long process and out of reach.

E414_Ecosystem connectivity (performance indicator): This indicator builds on the previous one. Relating how natural habitats are connected with alike agroecosystems. Therefore, the non-calculation of indicator E413 restrain the calculation of the present indicator. The technical requirements are not limiting therefore time was the main limitation.

E415_Land Use and Land Cover Change (performance indicator): This indicator requires data from 20 years ago and high farmer involvement which the design of this thesis did not provide. Therefore, it was not calculated.

> **E42_Species Diversity**: The focus of this subtheme is on practices which enhance diversity of wild species and diversity of domesticated species living in the farm. It will be calculated through the indicators **E421**, **E422** and **E424**. The indicator E423 will not be considered.

E421_ Species Conservation Target: "Has the enterprise set a target for the conservation and rehabilitation of the populations of rare and endemic species in its sphere of influence?"



Measurement:

Farmers were asked if they have a "written plan - available to stakeholders- which includes measurable and binding targets for habitat conservation and rehabilitation, with steps and expected time-frame."

E422_Species Conservation Practices (Performance indicator): "What activities and practices has the enterprise implemented to protect, maintain and/or rehabilitate the integrity of populations of wild plants and animals in its sphere of influence?"

Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. Other practices were assessed by direct observation. The practices assessed are as follows:

Best Practices:

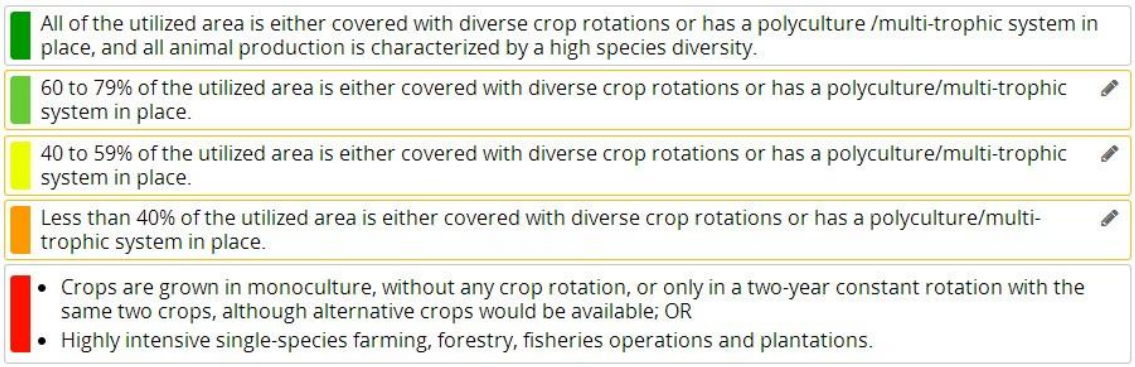
1. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.
2. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.
3. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

4. Creation and maintenance of habitat networks that facilitate exchange between populations.
5. Establishment of conservation of multi-species tree stands.
6. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.
7. Installation of nesting aids.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row shows percentages of best practices applied in reference to all best practices possible. Percentages represent different scores of the indicator. It is important to understand that following this method it is assumed that all practices has the same wild species conservation potential. Expert advice about local ecosystems was not seek.

E423_Diversity and abundance of Key species (performance indicator): The requirements of information gathering and the posterior flora inventory on-farm required for the calculation is not possible according the time to develop this thesis. Therefore, this indicator will not be calculated.

E424_ Diversity of Production: "On what share of the utilized area does the enterprise have a diverse crop rotation and/or use several species at the same time?"

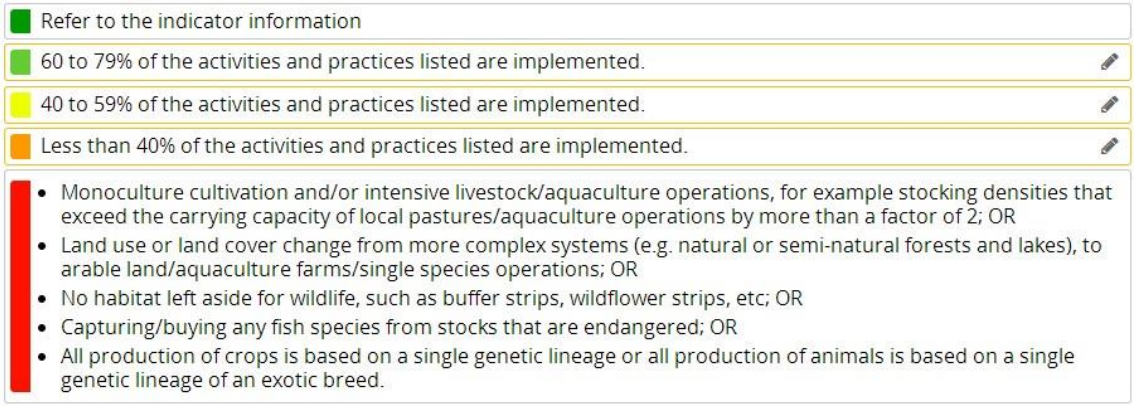


Measurement:

The indicator was calculated through direct observation. No mapping techniques were used. Therefore, this indicator is approximated. Factors considered in this indicator are: diverse crop rotations and where several plant and tree species are produced at the same time. Only areas where horticulture was practiced are evaluated.

> **E43_Genetic diversity**: The emphasis is on practices which enhance diversity of wild populations and agrobiodiversity through the cultivation of different varieties. It will be calculated through **E431**, **E432**, **E433** and **E435**. The indicator E434 is eliminated.

E431_Wild genetic enhancing practices: "What activities and practices has the enterprise implemented that have effectively helped to conserve and rehabilitate the genetic diversity of wild species in its operation?"



Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. Other practices were assessed by direct observation. The practices assessed are as follows:

Best Practices:

1. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.
2. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.
3. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).
4. Creation and maintenance of habitat networks that facilitate exchange between populations.
5. In-situ conservation of genetic diversity.

Unacceptable Practices:

6. Monoculture cultivation; OR
7. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
8. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
9. All production of crops is based on a single genetic lineage.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row are percentages of best practices applied in reference to all best practices possible. Percentages represent different scores of the indicator. It is important to understand that following this method it is assumed that all practices has the same wild species conservation potential. Expert advice about local ecosystems was not seek.

E432_Agro-biodiversity in-situ Conservation (Performance indicator): Due to time and the information gathered during the interviews was not possible to calculate this indicator.

E433_Locally adapted breeds: Due to time and the information gathered during the interviews was not possible to calculate this indicator.

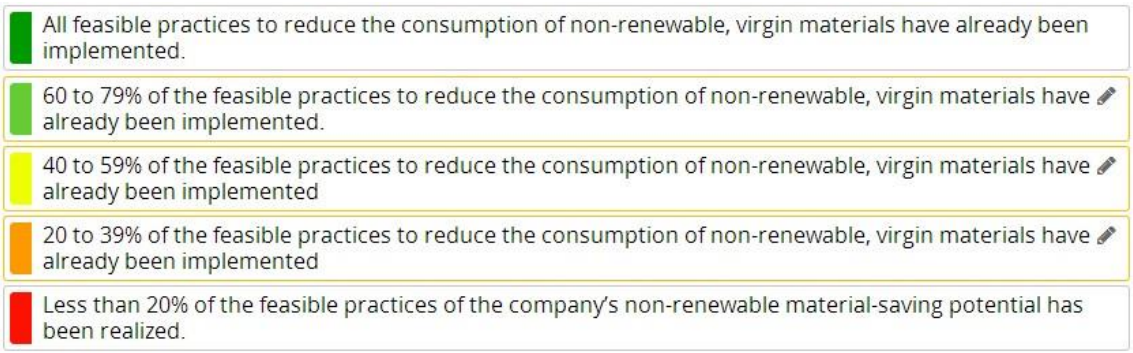
E434_Genetic diversity in wild species: The necessity to have an inventory of wild species and therefore the time it requires was out of reach of this study. Accordingly, this indicator was not calculated.

E435_Saving Seeds (performance indicator): The information gathered during the interviews and the posterior calculation of the indicator showed data inconsistencies and the noncalculation of the indicator was then considered.

E5_MATERIALS AND ENERGY: The theme in this thesis emphasizes on techniques which allow for a more self-sustain farming techniques through the recycling of natural resources, use of renewable energies and therefore reduction of waste generation. The subthemes considered are: Material use, Energy use and Waste reduction and disposal.

> **E51_Material Use**: The assessment focuses on practices which reduces the use of nonrenewable materials. The indicator **E511** will be used. The indicators E512, E513, E514 will not be considered.

E511_Material Consumption Practices: "What practices and activities has the enterprise implemented that effectively replaced virgin non-renewable materials by recycled/reused/renewable ones in the operation and replaced synthetic inputs by natural inputs?"



Measurement:

First, during the interviews the main common input materials were identified. Second, a table was developed with inputs (rows) and farms (columns). Third, practices were rated from 1 to 5 according to the following prioritization stated in the SAFA indicator: minimize material input (5) > minimize wastage (4) > recycle waste and use internal material resources (3) > acquire recycled and/or recyclable materials (2) > acquire non-recycled materials (1) > acquire non-recyclable virgin materials (0).

Six inputs were considered: drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary. Therefore, the maximum punctuation was 30 which equals 100%. The percentages were calculated according to this scale. The percentage represents the implementation of feasible practices to reduce the consumption of non-renewable materials. Fuel has been included even if SAFA excludes it.

E512_Nutrient balances (Performance indicator): The information required to calculate this information is big, therefore the availability of this information from all the farmers was not

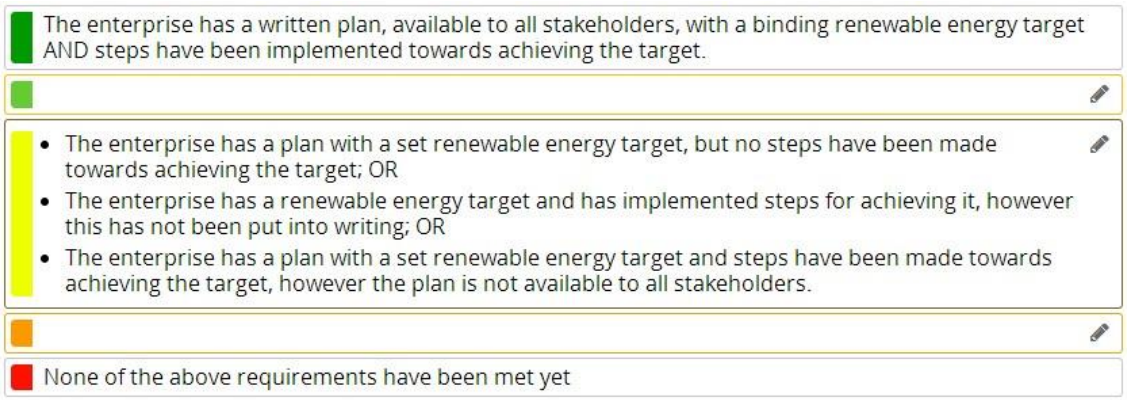
gathered. Furthermore, the time required for a proper on-farm nutrient balances made difficult its finalization during the time reserved for this study. According to the conditions stated above this indicator was not calculated.

E513_Renewable and Recycled Materials (performance indicator): The calculation of this indicator was feasible according to the capacities. However, is a time consuming job and there is the necessity of complete data inventories of materials and inputs purchased during the last year from farmers which was difficult. Therefore, according to these limitations this indicator was not calculated.

E514_ Intensity of material use (performance indicator): The historical frame of the indicator, last 5 years suppose a challenge for the calculation of this indicator. Data availability and research time were important limitations. Therefore, it was not considered.

E52_Energy Use: The objective of this subtheme is to assess how the energy consumption is minimized and how use of renewable energy is maximized and how it is plan to do so in the future. The indicators **E521** and **E522** were used. The indicators E523 and E524 was discarded.

E521_Renewable Energy Use Target: **"Has the enterprise set a target for the share of renewable and sustainable energies in its total direct energy use?"**



Measurement:

Farmers were asked if they have a "written plan - available to stakeholders- which includes measurable and binding targets for renewable energy increase, with steps and expected timeframe."

E522_Energy Saving Practices: "What practices and activities has the enterprise implemented that effectively reduced the energy requirements in its operation?"

Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. Other practices were assessed by direct observation. The practices assessed are as follows:

1. Mainstreaming principles of sustainable energy use into strategies and operations and monitoring energy use and the structure of energy supply, if possible at process level;
2. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff;
3. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more energy efficient machinery and procedures;
4. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.
5. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row shows percentages of best practices applied in reference to all best practices possible. Percentages represent different scores of the indicator. It is important to understand that following this method it is assumed that all practices has the energy-saving potential. Expert advice about practices and activities with potential to save energy was not seek.

E523_ Energy Consumption (performance indicator): The intention of the indicator to assess how the direct energy consumption per unit of produce changed during the past five years requires a lot of data availability and time. Therefore, according to the short time and the expost analysis which the thesis is based on the indicator was not calculated.

E524_Renewable Energy (performance indicator): This indicator is related to the calculation of the previous indicator. The non-calculation of the indicator E523 makes impossible the calculation of this indicator.

> **E53_Waste reduction and disposal**: The focus of the subtheme is in practices that reduce and prevent waste generation. The indicators used are **E531** and **E532**. The indicators E533 and E534 will not be calculated.

E531_Waste Reduction Target: “Has the enterprise set a target in reducing the generation of waste, as well as the hazardousness of this waste, in or by its operations?”

Measurement:

Farmers were asked if they have a "written plan - available to stakeholders- which includes measurable and binding targets for waste reduction, with steps and expected time-frame."

E532_Waste Reduction Practices: "What practices and activities have been implemented that effectively reduced waste generation in the enterprise's operation?"

Measurement:

First, during the interviews the main common waste were identified. Second, a table was developed with inputs (rows) and farms (columns). Third, practices were rated from 1 to 5 according to the "waste hierarchy" stated in the SAFA indicator: reduce-minimize waste generation (5) > reuse-utilize by-products and establish cascading materials flow (4) > recycle-reprocess waste for further use (3) > recover- generate energy from the remaining waste using a variety of technologies (2) > dispose of remaining waste in a safe and clean manner (1) > bad disposal of residues (0).

Four residues were considered: drip irrigation system, boxes, mulch and crop residue. Therefore, the maximum punctuation was 20 which equals 100%. The percentages were calculated according to this scale. The percentage represents the implementation of feasible practices to reduce waste generation.

E533_Waste disposal (performance indicator): The necessity to identify the types and quantities of waste in the farms made difficult to calculate this indicator according to the time reserved for each farm visit. Therefore, it was not calculated.

E534_ Food Loss and Waste Reduction (performance indicator): The necessity to identify the types and quantities of food produced in the farm and the percentage lost was not an easy job. It requires data and time. Therefore, the indicator was not calculated.

Animal Welfare: The theme analyzes the physical and psychological health of animals in the farm. To avoid data asymmetries this theme was not considered because not all farms under study use or raise animals.

ECONOMIC RESILIENCE:

C1_INVESTMENT: The theme aims at recognizing how the perspective of long-vision and sustainability is reinforced by how the money is allocated. Furthermore, considers the profitability of the enterprise. The theme is composed of internal investment, community investment, long- ranging investment and profitability.

> **C11_Internal Investment**: The subtheme focuses on which activities the enterprise invests continuously to increase farm sustainability. It will be calculated using the indicator **C111**.

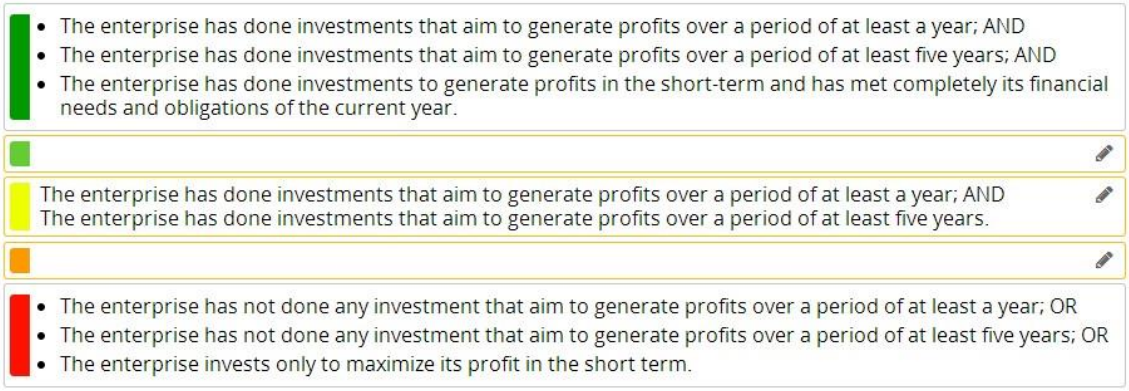
C111_Internal Investment: "In which activities and practices has the enterprise invested during the last 5 years to improve and monitor its social, economic, environmental, and governance performance?"

Measurement:

The indicator should be calculated by accessing to farm documents. However, for this study that was not possible. Hence, farmers were asked about their investments in the last 5 years. The sustainability contribution of investments to sustainability depends on the researcher.

> C12_Community investment: The scope of the study does not consider the effect on the nearby community. It will be difficult to find stakeholders which can give information about it with the short time scheduled for the study.
>
> **C13_Long Ranging Investment:** the aim of the subtheme is to assess how investments in production facilities, resources, market infrastructures aim at long term sustainability than maximizing short-term profit. It will be calculated through the indicators **C131** and **C132**.

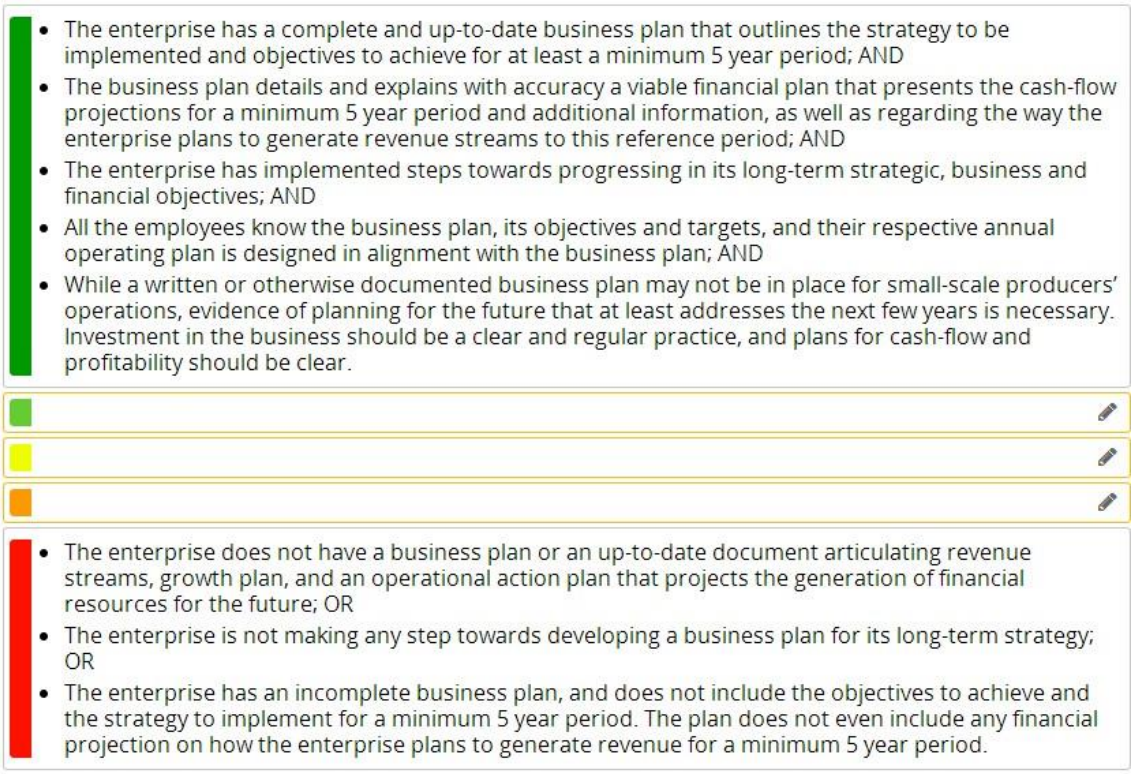
C131_Long Term Profitability: "Do the enterprise' investments aim to establish and reinforce the conditions to maintain, generate and increase the enterprise profits in the longterm?"



Measurement:

Following on the indicator C111. Long term in this indicator (according to SAFA) might be considered as from over 5 or 7 years or more.

C132_Business Plan: "Does the enterprise have a business plan or an up-to-date document articulating revenue streams, growth plan and an operational action plan that projects the generation of financial resources for the future?"



Measurement:

Farmers where asked if they have a complete business plan according to SAFA indications.

> **C14_Profitability:** the subtheme assesses how through investments and business activities the enterprise generates a positive income and therefore it is viable. It will be calculated using the indicators **C141**, **C142** and **C143**.

C141_Net Income: "Does the earned revenue that the enterprise retains exceed the total expenses, including interests and taxes associated with producing the goods sold, during the last five years?

- The resulting net income is greater than 0 in each year of the last five years. Positive net income is expected in every reporting period. Temporary negative net income is not necessarily unfavorable, as in the case of seasonal crop producers where negative profits might be part of their business cycle; AND
- Net income grows from one year to the other, or within the 5-year period. Growth is calculated as follows: net income in reporting period 2, minus net income in reporting period 1, divided by net income in reporting period 1; AND
- The enterprise has capitalized with its own financial resources during the 5-year period. This could be evaluated with the following ratios: total debt, minus total assets ratio decreases in the period (short term debt + long term debt), divided by total assets; OR total debt-to-capital ratio decreases in the period (total debt (short-term/long-term) divided by shareholders' equity + total debt).

The resulting net income is greater than 0 in three of the last five years; AND
Net income grows within the 5-year period; AND
The enterprise can pay the debts.

The resulting net income is 0 or below (negative) in each year of the last five years.

Measurement:

The indicator was calculated by sending the indicator table to farmers. Some farmers were able to answer alone, others needed support (telephone or videoconference) and the majority did not answer the mail. Therefore, the valuations of some of the farmers are approximations.

If the enterprise has not a calculated net income it is considered as a bad performance (red).

C142_Cost of Production: "Has the enterprise completed a process to determine the total cost of the product sold and per unit of production to calculate your break-even-point?"

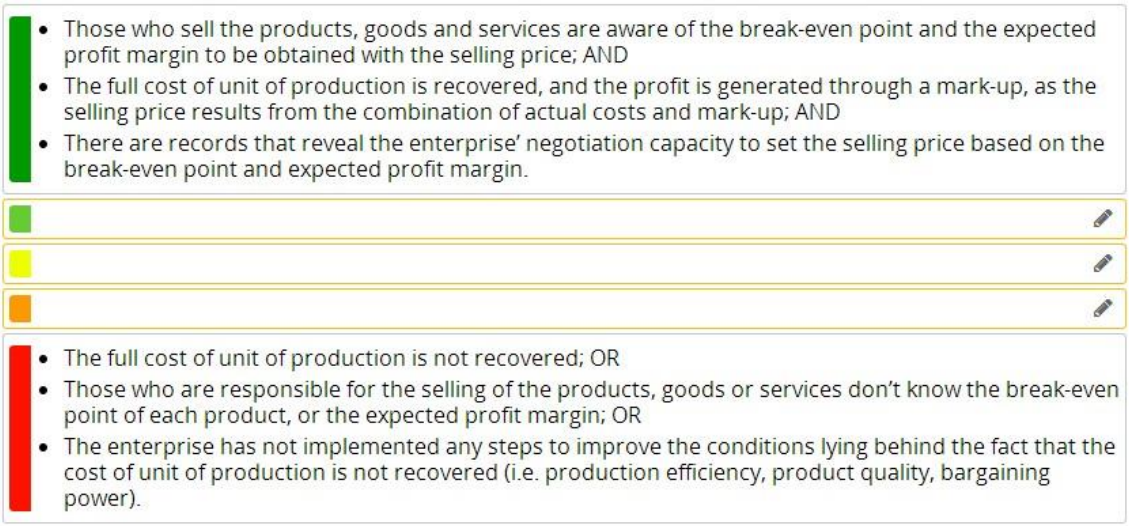
- The enterprise registers effectively and systematically all the costs incurred in the production of the goods, products and services for each year; AND
- The enterprise calculates the total cost of production for all the products, goods and services produced in the period; AND
- The enterprise calculates the cost per unit of production of each product, goods or service produced; AND
- The enterprise calculates the break-even point for each product, goods or service produced in the year; AND
- The correspondent employees of the accounting, production and commercial department are trained and informed on the cost of production and the break-even point of each product.

- The enterprise does not record the costs of production, direct and indirect, in an effective and systematic way; OR
- The enterprise has not calculated the total cost of production of the goods, products or services produced for the period year; OR
- The enterprise has not calculated the cost per unit of production of each product, goods or service produced; OR
- The enterprise has not calculated the break-even point for each product, goods or services produced; OR
- The enterprise has not implemented any steps towards training the correspondent employees in basic accounting to calculate the cost of production and break-even point.

Measurement:

Farmers were asked about their knowledge about their costs of production. The indicator was interpreted from their answers.

C143_Price Determination: "Has the enterprise considered a break-even point to negotiate with their buyer's selling price in all contracts?"



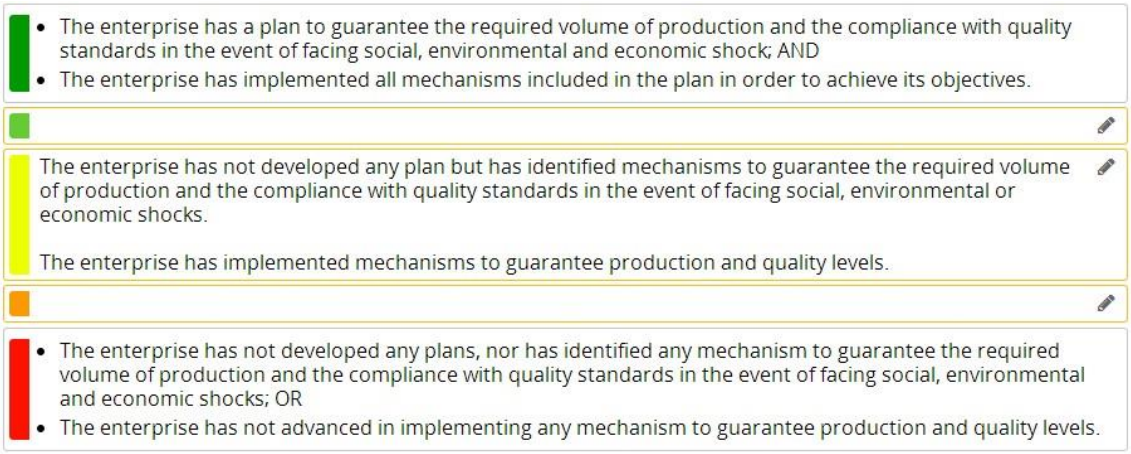
Measurement:

Farmers were asked about the knowledge of the break-even point. By demonstrating knowledge about their break-even point the researcher assumed that farmers use it in their transactions and that benefit is done through a mark-up on the break-even point.

C2_VULNERABILITY: The theme refers to how practices used by the enterprises enhance its stability or vulnerability in reference to exposure, sensitivity or adaptive capacity of the social and natural systems. The subthemes used to calculate the theme are Stability of production, Stability of supply, stability of market, liquidity and risk management.

> **C21_Stability of Production**: the subtheme assesses if the quantity and quality of production is enough resilient to resist and adapt to environmental, social or economic shocks. It will be calculated using the indicators **C211** and **C212**.

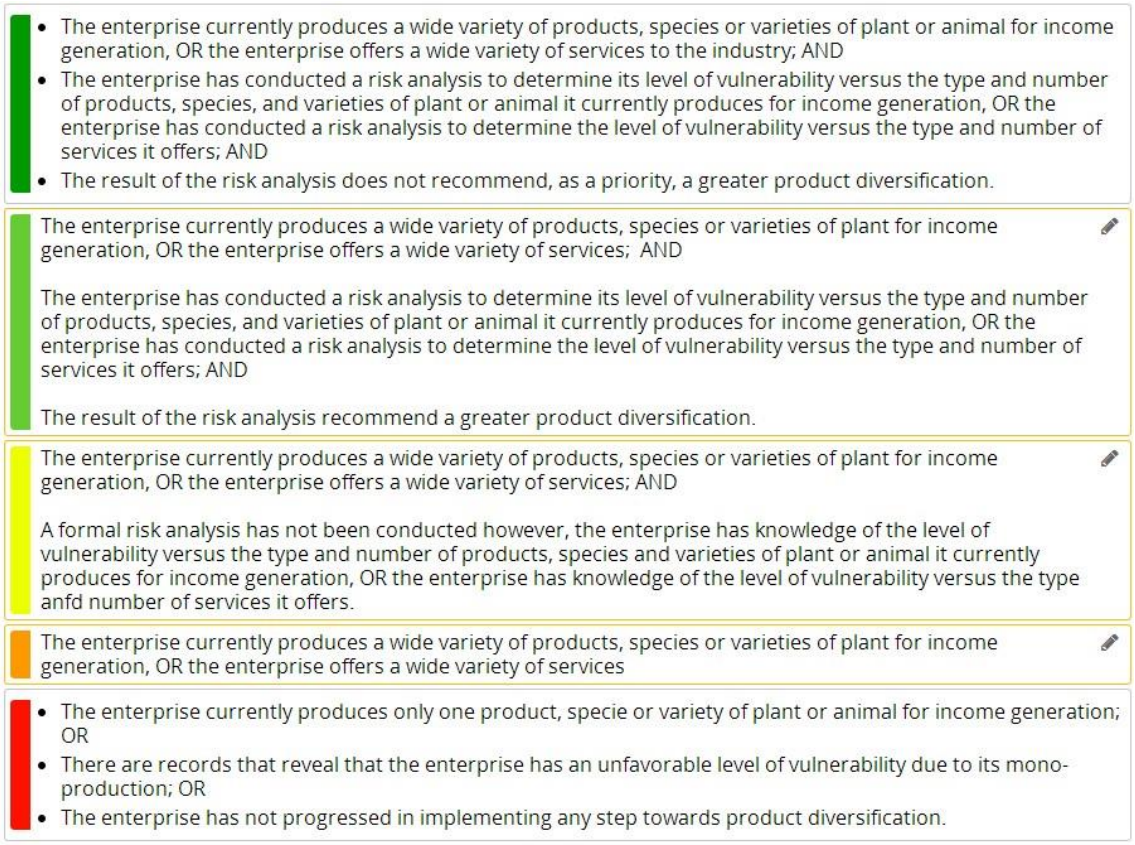
C211_Guarantee of Production Levels: "What are the actions and mechanisms that the enterprise has put in place to reduce the negative impact of the risks that could affect meeting the target volume of production and quality standards?"



Measurement:

The farmers were asked about which mechanisms do they implemented to prevent any disruption of the volume of production and quality standards of potential shocks, listed and explained. The quantity of mechanisms in place is not represented.

C212_Product Diversification: "Does the enterprise produce more than one product, specie or variety of plant or animal for income generation?"



Measurement:

Farmers were asked about how many different crops and activities farmers develop and produce direct income generation. Furthermore, they were asked if they developed any risk analysis related with diversification and what are they future plans and why.

> **C22_Stability of Supply**: The focus of the subtheme is on the business relationships with suppliers and the capacity to diversify procurement channels. The indicators used for the rating of this subtheme will be **C221**, **C222** and **C223.**

C221_Procurement Channels: "Which actions and mechanisms has the enterprise put in place to reduce the risk of having input supply shortages, including maintaining ongoing business relationships with suppliers?"

- The actions and mechanisms implemented have targeted maintaining business relationships with a number of suppliers that could guarantee the required input supply; AND
- The actions and mechanisms implemented enable the access to alternative procurement channels, in case current suppliers fail to provide the required inputs; AND
- Since the implementation of such actions and mechanisms, there are no records of input supply shortages, or periods during which the enterprise has failed to meet the expected volume of production on time, or to deliver the service offered.

Actions and mechanisms have been implemented to guarantee the required input suply AND

There are no records of input supply shortages, or periods during which the enterprise has failed to meet the expected volume of production on time, or to deliver the service offered.

- No actions and mechanisms have been implemented to guarantee the required input supply; OR
- There are records of input supply shortages that have undermined the production process and the delivery of products and services to the market.

Measurement:

Farmers were asked about which mechanisms they have put in place to avoid supply shortages of their main inputs. The information given was contrasted with the indicator.

C222_Stability of Supplier Relationships: "What share of supplier contracts/business relationships has remained on-going over the last 5 years?"

- The share of contracts/business relationship with suppliers that enhance business development based on fair and beneficial terms and conditions and which has remained on-going over the last 5 years is 100%; AND
- The contracts/ business relationships maintained with the suppliers benefit the enterprise (i.e. delivery of inputs, quality and reasonable price);

The share of contracts/business relationships with suppliers that enhance bussiness development based on fair and beneficial terms and conditions and which has remained on-going over the last 5 years is MORE than 80%; AND

The contracts/business relationships maintained with the suppliers benefit the enterprise.

The share of contracts/business relationships with suppliers that enhance bussiness development based on fair and beneficial terms and conditions and which has remained on-going over the last 5 years is BETWEEN 40% and 80%; AND

The contracts/business relationships maintained with the suppliers benefit the enterprise.

The share of contracts/business relationships with suppliers that enhance bussiness development based on fair and beneficial terms and conditions and which has remained on-going over the last 5 years is LESS than 40%; AND

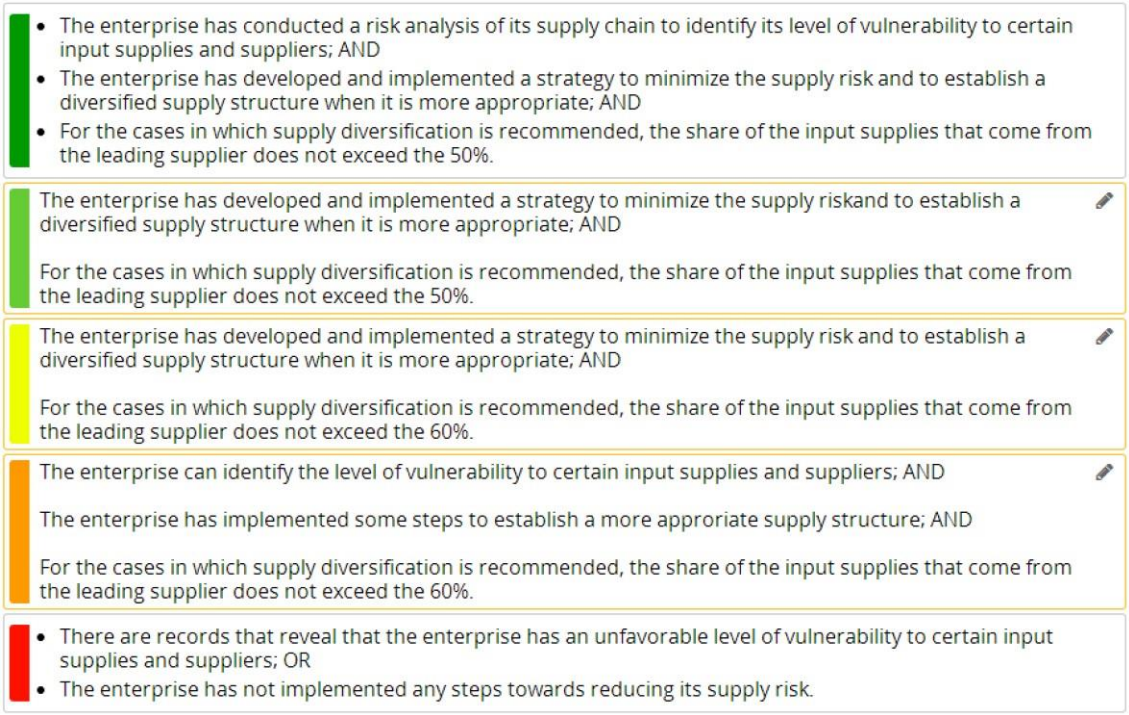
The contracts/business relationships maintained with the suppliers benefit the enterprise.

- The share of contracts/business relationship with suppliers that enhance business development based on fair and beneficial terms and conditions and which has remained on-going over the last 5 years is 0%; OR
- In each year of the period, the enterprise has modified its supplier structure; OR
- There are records of unfavorable practices the enterprise has had with any of its suppliers during the last five years.

Measurement:

According to the main inputs the enterprise was asked about the relationship with suppliers. The information given by the farmers was contrasted with the indicator. Business records were not reviewed.

C223_Dependence on the Leading Supplier: "What share of inputs comes from the leading supplier?"



Measurement:

According to the main inputs the enterprise was asked about the source of those inputs. For example, a farm which purchase each input from a different supplier it is consider to have a good supply structure.

> **C23_Stability of Market:** The focus of the subtheme is on the business relationships with buyers, the diversification of income structure and the diversity of marketing channels. The indicator used will be **C231**.

C231_Stability of Market: "Which actions and mechanisms has the enterprise put in place to ensure a diversified and consolidated income structure from product sales or from the services provided?"

- The actions and mechanisms implemented have targeted a diversified income structure with at least three or more buyers, where no buyer is responsible for more than 50% of the annual income obtained from the products sold; AND
- The actions and mechanisms implemented have targeted a consolidated income structure where buyers have maintained a business relationship for at least more than a year with written contracts or agreements; AND
- The actions and mechanisms implemented allow the enterprise accessing alternative marketing channels in case contracts, agreements or business relationships are discontinued; AND
- Since the implementation of such actions and mechanisms, there has been no records of related financial loses as all products or goods have been sold.

The actions and mechanisms implemented have targeted a diversified income structure with at least three or more buyers, where no buyer is responsible for more than 60% of the annual income obtained from the products sold; AND
The actions and mechanisms implemented have targeted a consolidated income structure where buyers have maintained a business relationship for at least more than a year with written contracts or agreements; AND
The actions and mechanisms implemented allow the enterprise accessing alternative marketing channels in case contracts, agreements or business relationships are discontinued; AND
Since the implementation of such actions and mechanisms, there has been no records of related financial loses as all products or goods have been sold.

The actions and mechanisms implemented have targeted a diversified income structure with at least three or more buyers, where no buyer is responsible for more than 70% of the annual income obtained from the products sold; AND
The actions and mechanisms implemented have targeted a consolidated income structure where buyers have maintained a business relationship for at least more than a year with written contracts or agreements; AND
The actions and mechanisms implemented allow the enterprise accessing alternative marketing channels in case contracts, agreements or business relationships are discontinued; AND
Since the implementation of such actions and mechanisms, there has been no records of related financial loses as all products or goods have been sold.

The actions and mechanisms implemented have targeted a diversified income structure with at least three or more buyers, where no buyer is responsible for more than 80% of the annual income obtained from the products sold; AND
The actions and mechanisms implemented have targeted a consolidated income structure where buyers have maintained a business relationship for at least more than a year with written contracts or agreements; AND
The actions and mechanisms implemented allow the enterprise accessing alternative marketing channels in case contracts, agreements or business relationships are discontinued; AND
Since the implementation of such actions and mechanisms, there has been no records of related financial loses as all products or goods have been sold.

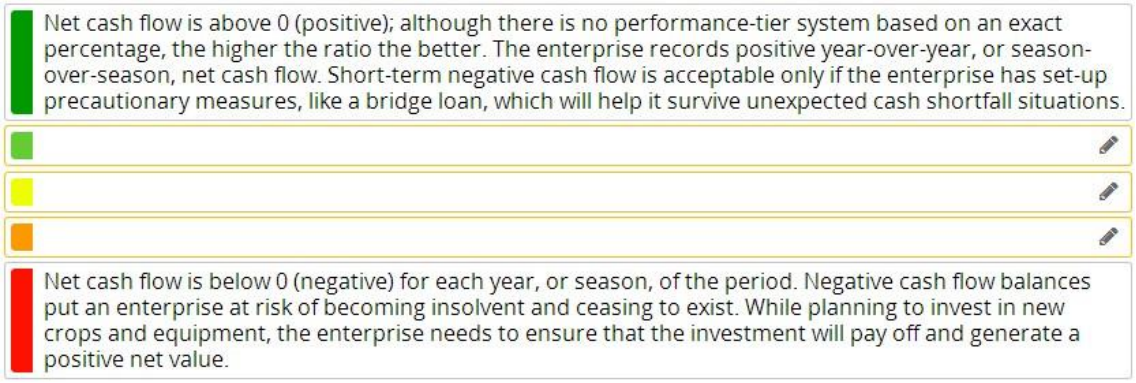
- One buyer is responsible for 100% of the annual income obtained from the products sold; OR
- The income structure of the enterprise is made of one or two buyers only; OR
- No actions and mechanisms have been implemented to enhance a diversified and consolidated income structure; OR
- There are no written records regarding the sales agreement or the purchase order from the buyer; OR
- There are records of financial loses as the enterprise has not been able to sell the products or goods at the appropriate time, and it has kept a large and unnecessary level of inventory, when applicable.

Measurement:

No business records were reviewed. Decisions taken to ensure a diversified structure were explained by the farmer. The researcher tried to focus on results obtained by those strategies. The percentage of products sold to each buyer is approximated in most of the cases.

> **C24_Liquidity:** The subtheme focuses on how the enterprise can withstand shortfalls in payment through financial liquidity and access to credit and insurances. The indicators used will be **C241** and **C242**.

C241_Net Cash Flow: "Has the enterprise generated a positive net cash flow in the last five years?"

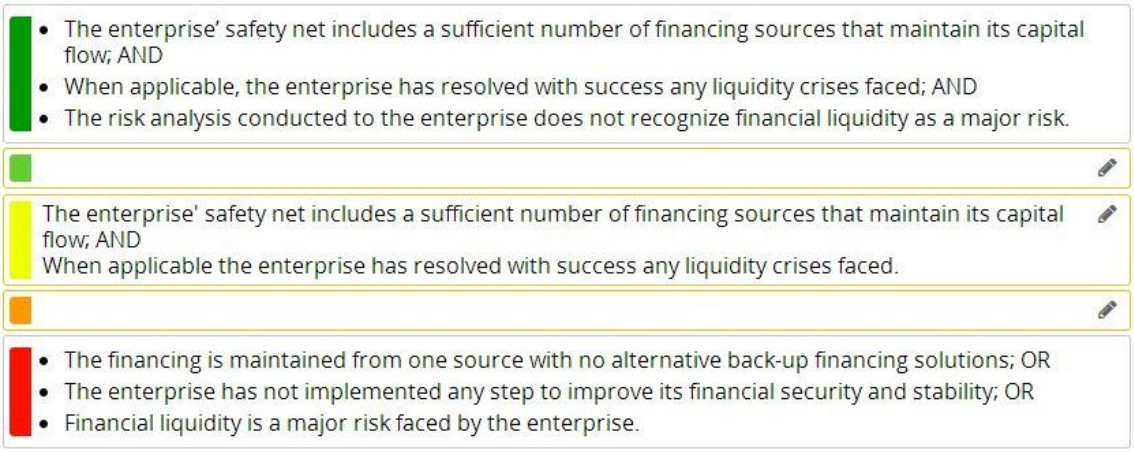


Measurement:

No review of cash flows was done. A complementary question was sent to the farmers with the ratings of the indicators and they marked their situation.

The farmers which did not answer the question the rating of the indicator is approximated by the researcher according to the information given during the interview.

C242_Safety Nets: "Does the enterprise have access to formal or informal financial sources to withstand liquidity crises?



Measurement:

No business record review was done. A complementary question was sent to the farmers with the ratings of the indicators and they marked their situation.

The farmers which did not answer the question the rating of the indicator is approximated by the researcher according to the information given during the interview.

> C25_Risk Management: The subtheme considers the strategies in place to manage internal and external risks. The subtheme was not calculated because farms studied have not developed a risk assessment

C3_Food quality and information: The theme is built around the concepts of product safety and product quality. It will not be calculated however all members are part of the organic European certification and therefore it is assumed that farmers are already controlled on those topics.

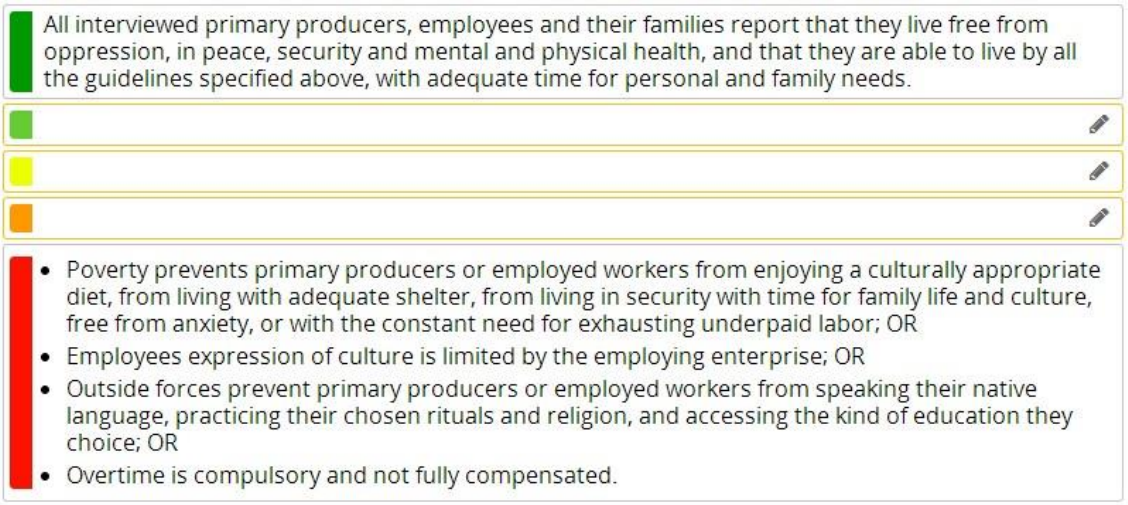
C4_Local economy: The contributions of the enterprise to the local level are not considered because it will require other stakeholders' perspectives which is not possible.

S_SOCIAL WELL-BEING:

S1_DECENT LIVELIHOOD: the theme considers that farmers can achieve a decent standard of living and have the ability to save for further needs and goals according to the region where they live and work. The theme is composed of quality of life, capacity development and fair access to means of production.

> **S11_Quality of Life:** All people working in the farm enjoy culturally and nutritionally adequate diet and have time for family, rest and culture. The indicators used for the calculation of this subtheme are: **S111** and **S112**

S111_Right to Quality of Life: "Do all primary producers, smallholders and employees in enterprises of all scales have time for family, rest and culture, and the ability to care for their needs such as maintaining adequate diets?



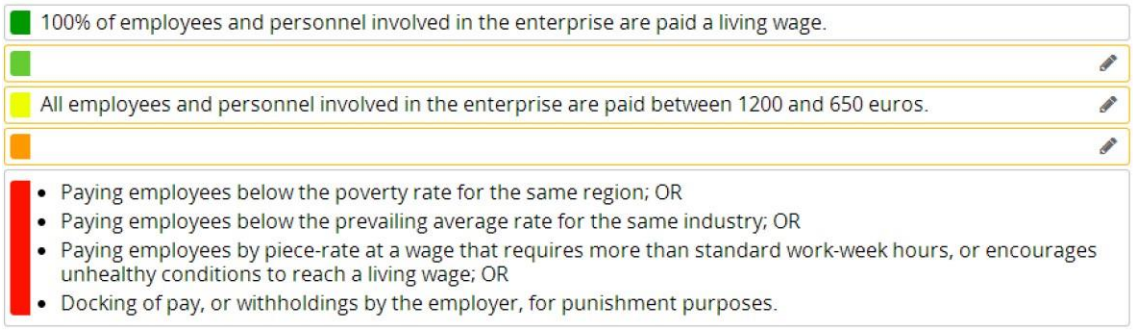
Measurement:

In this indicator the researcher has considered the five components specified in SAFA:

1. Healthy work environment and no compulsory overtime. (40 to 48h per week and breaks during the day)
2. Ability to participate in a culture of their own choice. (language, religion, etc.).
3. Appropriate diet
4. Time to spend with family and friends. (meal times, family time, guests or visitors, etc.)
5. Access to sanitary facilities.

According to the information given by the farmer on the five topics the indicator is rated. Direct observation was also considered to answer this indicator.

S112_Wage Level: "Do all primary producers who supply enterprises and all employees earn at least a living wage?



Measurement:

The living wage in this study is considered 1200 euros per month. The number comes from direct questioning farmers in the study during our interview about what they consider a living wage. The researcher has set the benchmark.

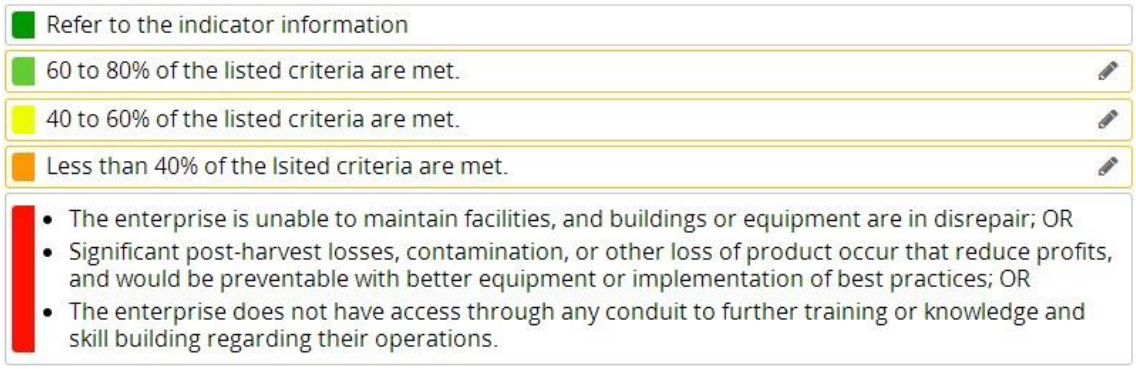
The minimum wage acceptable on this study or poverty is the minimum wage in Spain which is around 650 euros per month.

Direct asking to the farmers about their salaries was the first approximation. Foreword questioning with the same intervals as the indicator was sent by mail to obtain information from the farmers uncomfortable about the question at the moment of the interview.

S12_Capacity development: The subtheme refers to the access to training and education to undertake current and future practices in the enterprise. This subtheme is excluded of the study due to the difficulty to assess how much training the different farmers receive and have access to. Furthermore, just by being part of the CCPAE certification farmers have access to training.

S13_Fair Access to Means of Production: The subtheme considers means of production as equipment, capital and knowledge. It will be calculated using indicator **S131**

S131_Fair Access to Means of Production: "Do primary producers, including indigenous people, have access to the equipment, capital and knowledge or training necessary to make a decent livelihood feasible?"



Measurement:

The calculation of this indicator was developed using the list of practices available on SAFA. Farmers were asked about which practices are using and give examples on how those practices are applied. The practices assessed are as follows:

Practices:

1. Agricultural extension services that are regular and helpful.
2. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.
3. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.
4. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.
5. Trainings offered free of charge by major buyers.
6. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.
7. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.
8. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

An excel table was developed: practices (rows) are represented using numbers (the same numbers as the previous list) and farms (columns) are represented with their code. The application of a practice in a farm is represented by number 1, non-application of the practice is represented by number 0. The last row is the percentage of practices applied in reference to all practices possible. Percentages represent different scores of the indicator. It is important to understand that following this method it is assumed that all practices has the same potential to access to the means of production required.

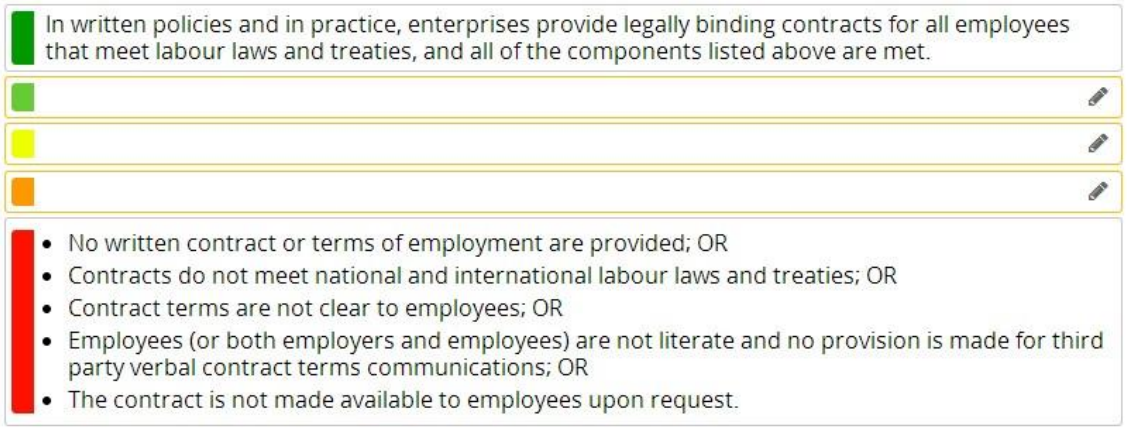
S2_Fair Trading Practices: The theme considers legal and human rights. Therefore, access to markets where fair prices are considered, negotiated and stable are desired. It comprises responsible buyers and right of suppliers. In this study farms studied are using short marketing channels that ensure better negotiations and therefore this subtheme will not be considered and are small primary producers probably which have small influence over suppliers.

S3_LABOUR RIGHTS: the theme refers to legal rights on labour relations between workers and employees. The subthemes which compose this theme are employment relations, forced labour, child labour and freedom of association and right to bargaining. Forced labour and child labour was not considered assuming that all participants comply with the law. Furthermore, freedom of association and right to bargaining was not considered due to the small number of workers in the enterprises assessed.

S31_Employment relations: The subtheme refers to legal and transparent contracts. The assumption of legal compliance applied to the other situations is not considered here because the practice of paying under the table is widely extended in the Catalan agriculture. It was calculated using the indicator **S311.**

S311_Employment Relations: "Does the enterprise or employees' subcontractors have written agreements with their employees that at least meet national and international labor

treaties including social security, or, for enterprises that are primary producers at least a clear understanding based on verbal agreement between employer and employees?"



Measurement:

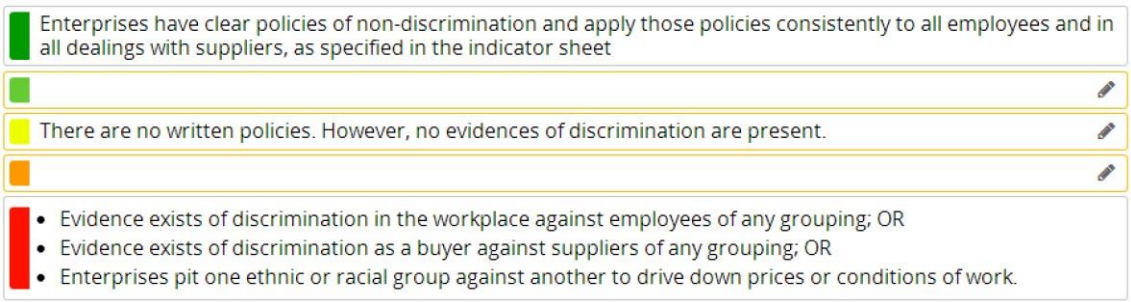
Farmers were asked about their work situation and their employees situation.

The information received was contrasted with the indicator information.

S4_EQUITY: The theme assesses how fair and inclusive is the distribution of resources and decisions made. The subthemes are non-discrimination, gender equality and support to vulnerable people. This last subtheme was not calculated due to the low capacity of farms (small) to incorporate people with disabilities or others.

> **S41_Non discrimination**: The subtheme focuses on hiring policies, employee or personnel policies that ensure strict equity. It will be calculated using the indicator **S411.**

411_Non Discrimination: "Does the enterprise discriminate against any employee or prospective employee based on race, creed, color, national or ethnic origin, gender, age handicap or disability (including HIV status), union or political activity, immigration status, citizenship status, marital status, or sexual orientation in hiring, job allocation, promotions and firing or in awarding contracts to primary producers for supplies?"



Measurement:

Farmers were asked about any code of conduct affecting their enterprise in reference to hiring and if not existence which factors guide their decisions.

The information given was contrasted with the indicator.

S42_Gender equality: The subtheme focuses on the existence of gender disparity in access to resources, education and career opportunities. It will be calculated using the indicator **S421.**

S421_Gender Equality: "Does the enterprise discriminate against women in hiring, remuneration, training, and advancement, access to resources or firing?

The enterprise does not discriminate against women in hiring, remuneration, training, advancement and access to resources, according to the criteria mentioned in the indicator sheet.
• Employers give preference to men in hiring, placement, training, pay and advancement, or any other aspect of the operations; OR • As buyers, enterprises give preference or pay higher prices to male primary producers in awarding contracts; OR • Enterprises fail to provide for the safety of pregnant women employees, do not provide paid maternity leave, fire women who take time off to have a baby, or refuse to allow women to return to their previous position or a position with similar wages when they return from maternity leave, and do not allow women to nurse during working hours.

Measurement:

The interviewee was directly asked about those topics. (Four of the 9 interviews were done to women and in just two cases of the interviews done to men there is no women working on the enterprise). The information received was contrasted with the indicator information.

S5_HUMAN SAFETY AND HEALTH: The theme focuses in promote and maintain the highest health degree of workers. It is calculated through the following subthemes: workplace safety and health provisions and Public health.

S51_Workplace Safety and Health Provisions: The subtheme assesses if the farm ensures a safe workplace. It will be calculated by **S511**, **S512** and **S513**.

S511_Safety and Health Trainings: "Does the enterprise provide training in health and safety for 100% of employees, that are understandable by employees, tailored to their workplace, and effective?"

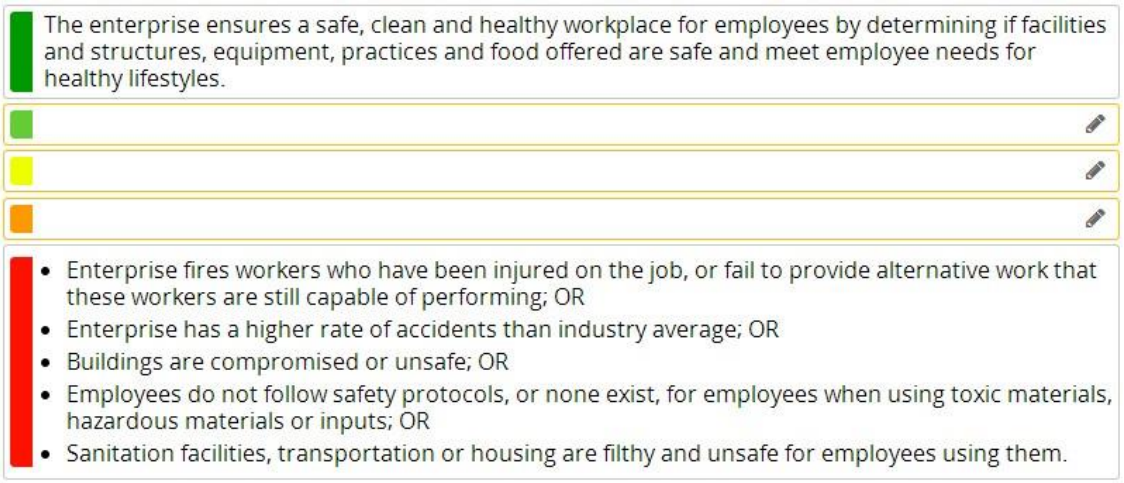
100% of employees have attended at least a basic health and safety training, those working on specialized equipment have also received appropriate trainings, and all criteria in the indicator sheet have been met.
60 to 80% of employees have attended at least a basic health and safety training , those working on specialized equipment have also received appropriate trainings, and all criteria in the indicator sheet have been met.
40 to 60% of employees have attended at least a basic health and safety training , those working on specialized equipment have also received appropriate trainings, and all criteria in the indicator sheet have been met.
Less than 40% of employees have attended at least a basic health and safety training , those working on specialized equipment have also received appropriate trainings, and all criteria in the indicator sheet have been met.
Health and safety trainings are not offered on-site or off-site for employees at least annually, or at least at the recommended level by local authorities or regional agencies.

Measurement:

The interviewed farmer was asked about the trainings in Safety and Health required in the enterprise.

The information given was contrasted with the indicator.

S512_Safety of Workplace, Operations and Facilities: "Does the enterprise maintain a safe, clean and healthy workplace including all grounds and facilities, and all practices?"



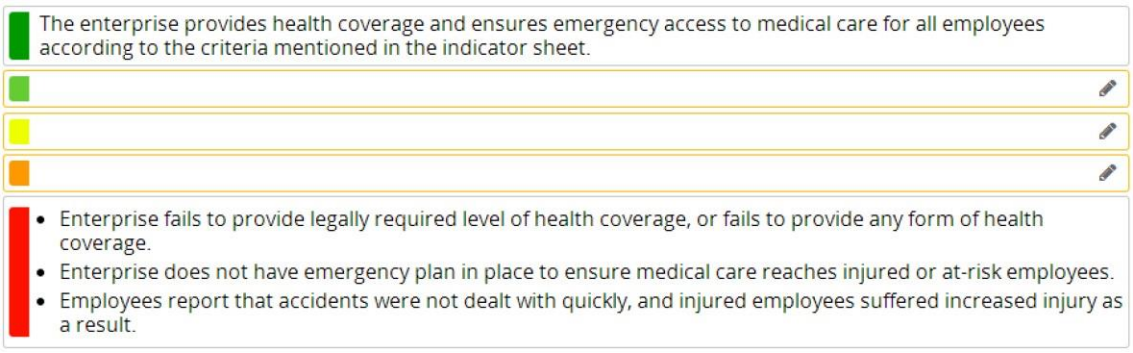
Measurement:

During the visit through direct observation the researcher assessed if buildings and structures meet relevant codes, sufficient ventilation, sufficient lighting, sanitation facilities and shelters.

Other aspects specified in SAFA make reference to bigger enterprises and will not be considered in this indicator.

The observed was contrasted with the indicator information.

S513_Health Coverage and Access to Medical Care: "Does the enterprise provide adequate health coverage per legal requirements, and ensure timely access to medical care in emergencies for employees?".



Measurement:

The interviewee was asked about health coverage given by the enterprise and emergency protocols.

The information given was contrasted with indicator information.

Public health: This subtheme assesses that operations and activities of the farm do not limit the health of the local community and contribute to its health. This subtheme will not be calculated because organic farming reduces environmental effects of the activities and the impacts are already calculated in environmental integrity. Furthermore, the calculation of this subtheme requires expansion of the scope to involve the local community which is out from the scope of the thesis and the effect of certifications.

S6_Cultural Diversity: the theme refers to the quality of and respect to the different cultures, ethnicities, political views, language in the farm. It is divided in two subthemes: indigenous knowledge and food sovereignty.

Indigenous knowledge: The subtheme will not be assessed due to the lack of indigenous communities in the area of study.

Food sovereignty: The magnitude of the concept and its relation with the certification schemes require more discussion than what the indicator can capture. The reference to food sovereignty was considered when comparing the different certifications.

Appendix 3: Justification of farms (SAFA)

PGS_vallès_1

My interview with one of the farmers of PGS_vallès_1 was conducted during 22/03/2016 and 05/04/2016 during 143 minutes of recorded interview and a total of 12 hours visit accounting for a walk around the farm, lunch and some work help to the farmer.

G_GOOD GOVERNANCE

G1_CORPORATE ETHICS

G11 Mission Statement

G111_Mission Explicitness:

The mission is: “to achieve economic viability of a small organic vegetable exploitation working through short distribution channels, achieving a living wage for all workers and maintaining farmers in the territory while providing families with healthy food.” This definition was collected during the interview. In their blog also they state the interest to present an alternative to the current food system.

The maximum influence of the mission is its capacity “to maintain the ideological essence while staying flexible and aware to the contextual changes in order to find ways that maintain the philosophy but are adapted to the present moment.” An example is the starting of selling directly in the farm or school meals.

The rating of this indicator is 5.

G112_ Mission Driven:

The farmer states that “the ideology is represented in the foundational papers of the farm, where social and cultural perspectives and techniques are stated”. Furthermore, their blog explains the strategies followed in order to achieve the mission as organic farming, direct relationship consumer-producer, seasonality, etc.

The rating of this indicator is 5.

G121_Due Diligence:

The enterprise has two different policies which guide their decisions. The first policy is reflected in the foundational papers and the other policy is related to the PGS which are more complete and guide what can be done and what not.

Therefore, the enterprise is proactive about risk management, which includes consideration of internal and external impacts before implementation of activities in all areas of sustainability. The enterprise has not experienced any major losses or caused major negative impacts as a result of unmitigated risks.

The rating for this indicator is 4.

G2_ACCOUNTABILITY

G21_Holistic Audit

G211_Holistic Audit

The enterprise is part of the PGS. The enterprise was used as an example farm for the test audit procedure. Nevertheless, that was more than 2 years ago.

The rating of this indicator is 4.

G22_Responsibility

G221_Responsibility

The economic aspect is collected in one annual assembly with the stakeholders. However, the environmental aspects are evaluated individually according to the different existing practices and possible alternatives (they substituted the tractor for a horse in weeding jobs), organic

agriculture per se does not justify low environmental impact. Furthermore, on the social level they are engaged in la Xarxeta network with periodically revise the social aspects of they work.

The rating for this indicator is 5.

G23_Transparency

G231_Transparency

The main policy is the presentation of the annual memory each year. It is open to all stakeholders. There is basically two parts: On the one hand, the contributions of the consumer cooperatives and on the other hand, the economic balance sheet. The budget for the next year is presented and proposals are done. Furthermore, through a weekly email they explain the situation of the garden, campaigns, etc. Finally, there is an open day and some collective activities as potato harvest. Furthermore, they offer the option of private meetings with consumer cooperatives or consumer groups. In la Xarxeta there are monthly assemblies with the local nuclei and 2 annual assemblies with the rest.

The rating for this indicator is 5.

G3_PARTICIPATION

G31_Stakeholder Dialogue

G311_Stakeholder Identification

The stakeholders were identified using direct relation as a reference. That can be material relationship by getting products or immaterial like exchange of work and knowledge.
Following this mechanism, the farmer was able to identify 50% of the common stakeholders.

The rating of this indicator is 3.

G312_Stakeholder Engagement

Consumers: The farmer considers that the participation of consumers is declining. What the farm is trying to offer is activities in the farm, open door days with party, weekly relationship with box schemes costumers and social media pages. Also the annual assembly. The idea of this processes is to enhance trust between consumer and producer. The farm is modifying its engagement mechanism in order to make it more effective.

Workers: The only full time worker besides the couple which runs the farm stays in the farm during the working days. During my visit I witness how he is involved in decisions.

Other farmers: the farmer is one of the leaders of the group of la Xarxeta which use a monthly assembly. Furthermore, they have relation with farmers outside la Xarxeta with whom the farm exchange work and products.

Organizations: the farm is part of different organizations and assists to meetings in order to create a collective movement.

The farm has achieved a satisfactory engagement mechanism with 100% of the stakeholders identified.

The rating of this indicator is 5.

G313_Engagement Barriers

The engagement barriers are seen from the point of consumer engagement.

The main obstacles are the distance from the capital (30 min by car from Barcelona) and the consumer culture of purchasing products without involvement.

Consequently, the farmer idea is to get consumer cooperatives more engaged because people belonging to those cooperatives changes continuously. Therefore, the connection with the individual consumer on those cooperatives and farmers have decreased. The aim is to reconnect the project with those people to make them feel part of the project. To achieve it the farm is changing its strategy from one annual common assembly to private meetings with different consumer's groups and cooperatives. Furthermore, the idea then is to reserve a day for each cooperative. During morning practical issues and evaluation will be discussed. Lunch and later a visit to the garden. A final activity of ludic character will be developed at the end. Farmers consider that the current situation is critic and they need to strengthen the engagement. Consumer cooperatives during the meetings have the option to propose strategies or further development of the farm.

Another obstacle is time. "Everyone rushes everywhere and then you prioritize commodity.
The idea is 'you bring me good vegetables at a good price but do not make me to come to assemblies'". Therefore, they are trying to make the day more interesting for families.

The last identified obstacle is that some consumers do not read the email. The farmers explain face-to-face the issues and impacts.

The enterprise has clear commitment with stakeholder engagement and participation, can identify potential barriers and has developed strategies to overcome these barriers. It has plans developed or in development for the remainder

The rating for this indicator is 5.

G314_Effective Participation:

Consumers are the main targeted stakeholder. They are engaged through direct communication, email, WhatsApp, social media, assemblies and visits. The farmer differentiates different levels of relevance. Therefore, when it is an individual request or opinion they deal with it the two interested parts. However, when it is common relevance the decisions taken according to stakeholder participation are communicated via email.
Furthermore, during assemblies consumers can express their critics and opinions and collective solutions are found during those assemblies.

Finally, the sales on-farm has supposed an engagement of local community. The farm has recovered box scheme costumers. The issues faced by these costumers are expressed face-toface during the two days they sale on farm.

Therefore, the enterprise is able to identify how decisions have been impacted and there are structures which allows stakeholders to participate. Furthermore, it has evidences on how stakeholder impact is communicated to them but the researcher was not able to consult them.

The rating of this indicator is 5.

G5_HOLISTIC MANAGEMENT

G51_Sustainability Management Plan

G511_Sustainabiltiy Management Plan

There is no plan. The ideological base and aims are clearer than the praxis or concrete actions. Therefore, the organization can articulate the values and aspirations the plan may address and ideas towards the objectives have been implemented. Furthermore, towards a monitoring of the impacts in reference to objectives the enterprise has modified their strategies.

Therefore, the enterprise has an informal unwritten plan and the organization can articulate the values and aspirations a plan may address in the four pillars of sustainability.

The rating of this indicator is 3.

G52_Full-Cost Accounting

G522_Full-Cost Accounting

The success of the enterprise after years of dedication is that "we have helped to encourage other experiences to start to produce, we have increased the awareness on the importance to include social aspects and a holistic vision to the production objectives."

The enterprise collects, analyze and reports to its stakeholders (consumers) in economic dimensions. The environmental and social dimensions are collected and analyzed but not reported to stakeholders.

Therefore, the enterprise understands the emerging discipline of full cost accounting and accounts for its impacts.

The rating of this indicator is 3.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases

E111_GHG Reduction Target

There is no set target or plan. The farm has incorporated animals for soil preparation work and weeding between rows.

However, the main source of GHG emissions is the tractor and the use of an air sprayer every 6 months for treatments and the cultivator. The farm uses a green manure mixture of *Vicia sativa*+ barley + mustard.

The rating of this indicator is 1.

E112_GHG mitigation practices

15. Soil fertility management with organic materials and improved fertilizer application timing.

The farm uses composted cow manure and “fervohumus” (organic waste compost). They fertilize depending on the next crop and never just after rain.

16. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

They follow a three-year crop rotation.

17. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced.

18. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

There are soil bunds.

19. Incorporation of residues

Yes.

20. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes, they revise them during the winter.

21. The efficiency of fixed equipment is maintained, such as refrigerating stores.

Yes.

22. Use of non-fossil fuel sources of energy.

No.

23. Restoration of degraded lands and/or drained organic soils.

No.

24. Implementation of sound agroforestry practices.

No.

Unacceptable practices:

25. Drainage of organic soils for cultivation; OR
26. Application of high ratings of nitrogen fertilizer; OR
27. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR

28. Practice of slash and burn or burning of residues.

Farmers burn crop residues which are contaminated by pests. The avoidance of composting them is because they do not know if the temperature in the compost is enough to sanitize the compost.

The farm applies 70% of best practices. However, they also apply one unacceptable practice. Therefore, the rating of this indicator is 1.

E12_Air Quality

E121_Air Pollution Target

There is no set target or plan.

The rating for this indicator is 1. E122_Air

Pollution Mitigation Practices Best

Practices:

5. Soil fertility management with optimized fertilizer application ratings and timing (both within the season and within the day)

They fertilize depending on the next crop and never just after rain.

6. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

There are no bare fallows. Green manure is used. The mixture and species is detailed in E_112.

Unacceptable Practices

7. Uncontrolled or poorly managed waste incineration; OR
8. Burning of crop residues; The farm burns crop residues.

The farm applies 100% of best practices and one unacceptable practice.

The rating for this indicator is 1.

E2_WATER

E21_Water Withdrawal

E211_Water Conservation target There

is no plan or target.

The rating for this indicator is 1.

E212_Water Conservation Practices Best

Practices:

11. Mulching and tillage to break pore continuity and reduce water evaporation from

soils Yes. Straw or paper is used.

12. Water harvesting No.

13. Minimization of irrigation water, such as by use of efficient irrigation technologies Yes. Drip irrigation is the norm. However, for some crops sprinkler irrigation is used. 14. Use of soil moisture and rainfall sensors to optimize irrigation schedules No.

15. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes.

16. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes.

17. Wastewater recycling in vegetable cleaning

Yes.

Unacceptable Practices:

18. Inefficient or not regularly maintained irrigation systems; OR
19. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
20. Inefficient use of water for handling and processing purposes.

The farm applies 71% of best practices and no unacceptable practices are used.

The rating for this indicator is 4.

E22_Water Quality E221_Clean

Water Target There is no plan

or target.

The rating for this indicator is 1.

E222_Water Pollution Prevention Practices Best

Practices:

10. Use of cover crops, and avoidance of bare fallows Yes.

11. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc.; The farm is under organic production and polyculture is practiced.

12. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are the norm.

13. Adoption of no spray buffer zones Yes. Edges.

14. Conservation tillage practices No.

15. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life

The only phytosanitary used are accepted by European legislation.

16. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Yes.

Unacceptable Practices:

17. Application of pesticides that are not allowed by law; OR
18. Absence of any buffer zones to protect surface water, violation of water protection areas.

The farm applies 86% of best practices and no unacceptable practices are applied.

The rating for this indicator is 5.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

6. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

Yes. The farm uses composted cow manure and “fervohumus” (organic waste compost).

7. Wise application of mineral fertilizers to improve soil fertility No.

8. Liming to increase soil pH if acidity is present Yes.

9. Better drainage and/or subsoiling to increase nutrient availability and water retention

Yes.

10. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

Yes. They follow a three-year crop rotation.

80% of practices considered to enhance soil quality are applied in the farm.

The rating for this indicator is 5.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices

Best Practices:

10. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced.

11. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

The farm fertilizes with organic fertilizers in some moment farmers have used tricoderma, fungus and bacteria. Pest management is based in natural products treatments and reservoirs of beneficial fauna (conservation biological control). Weed management is mechanic, using the horse or manual between plants.

12. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

The farm follows a 4-year crop rotation based on families. The farm has flower strips and is planning to create living fences.

13. Creation and maintenance of habitat networks that facilitate exchange between populations.

The farm leaves the forest areas and the edges next to them for spontaneous flora. Furthermore, it is complemented by planting some other species.

14. Longer crop rotations, including nitrogen fixing species 4-year crop rotation with nitrogen fixing species.

15. Coverage of bare ground and other soil protection measures.

Bare soil is avoided.

Unacceptable Practices:

16. Annual monoculture cultivation and /or high external input livestock systems; OR
17. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR 18. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

83% of best practices are applied in the farm.

The rating for this indicator is 5.

E42_Species Diversity

E421_Species Conservation Target

There is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

8. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced.

9. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm fertilizes with organic fertilizers in some moment they have used tricoderma, fungus and bacteria. Pest management is based in natural products treatments and reservoirs of beneficial fauna (conservation biological control). Weed management is mechanic, using the horse or manual between plants.

10. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

The farm follows a 4-year crop rotation based on families. The farm has flower strips and is planning to create living fences.

11. Creation and maintenance of habitat networks that facilitate exchange between populations.

The farm leaves the forest areas and the edges next to them for spontaneous flora. Furthermore, it is complemented by planting some other species.

12. Establishment of conservation of multi-species tree stands.

No. There are some trees.

13. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

The farm leaves the forest areas and the edges next to them for spontaneous flora. Furthermore, it is complemented by planting some other species.

14. Installation of nesting aids.

No

57% of practices are applied in farm. ¨ The

rating of this indicator is 3.

E424_ Diversity of Production

The farm cultivates 17 species and 39 different species all year-round.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

10. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced.

11. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm fertilizes with organic fertilizers in some moment they have used tricoderma, fungus and bacteria. Pest management is based in natural products treatments and reservoirs of beneficial fauna (conservation biological control). Weed management is mechanic, using the horse or manual between plants.

12. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

The farm follows a 4-year crop rotation based on families. The farm has flower strips and is planning to create living fences.

13. Creation and maintenance of habitat networks that facilitate exchange between populations.

The farm leaves the forest areas and the edges next to them for spontaneous flora. Furthermore, it is complemented by planting some other species.

14. In-situ conservation of genetic diversity.

The farm saves some seeds.

Unacceptable Practices:

15. Monoculture cultivation; OR
16. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
17. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc.; OR
18. All production of crops is based on a single genetic lineage.

80% of best practices are applied in the farm.

The rating for this indicator is 5.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: The farm is transitioning from drip irrigation tape to rigid irrigation tube. Which has a longer life span (4).

Fuel: to reduce the dependency of fossil fuels they do the weeding with a horse. (5)

Mulch: Paper and straw. (2)

Fertilizer: The farm acquires manure from a nearby farm (3)

Boxes: Are made of recycled plastic (2)

Phytosanitary: The farm through the management reduces the necessity to use phytosanitary products (5)

The farm applies 70 % of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 4.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set.

The rating for this indicator is 1. E522_Energy

Saving Practices

6. Mainstreaming principles of sustainable energy use into stratinggies and operations and monitoring energy use and the structure of energy supply, if possible at process level;

Not for the whole farm. However, they are monitoring energy consumption of a new air conditioning engine of the cold storage.

7. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff;

Farmers have open dialogues about it.

8. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more enrgy efficient machinery and procedures;

The use of a horse it is reducing more energy-intensive processes.

9. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

Efficiency and coherence are important when choosing machinery.

10. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

No.

80% of feasible energy-saving practices have been implemented.

The rating for this indicator is 5.

E531_Waste Reduction Target:

The farm has no plan or target set.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: The farm is changing the drip irrigation for rigid. They still have some drip irrigation tape which they bring to the waste management center every month. They are uncertain about the proper management done. (5)

Boxes: They reuse the boxes (5)

Mulch: Paper is biodegradable (3).

Crop residue: it is composted or reincorporated to the field. However, they burn the ones infected. (0)

65 % of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 4.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

The enterprise has invested in a cold storage room, irrigation programmers, a webpage, an accounting program, an accountant and a horse. Therefore, the enterprise has targeted investments that improve the enterprise sustainability. The enterprise can demonstrate progress in sustainability.

The rating for this indicator is 3.

C13_Long-ranging Investment

C131_Long Term Profitability

The enterprise has invested in a cold storage room, irrigation programmers, a webpage, an accounting program, an accountant and a horse. Therefore, the investments aim at generating profits over at least a year and at least five years. The enterprise has met completely its financial needs and obligations of the current year.

The rating for this indicator is 5.

C132_Bussines Plan

The enterprise has a business plan that collects the projected investments, business viability and the cash-flow for a period of 3 to 5 years.

The rating of this indicator is 5.

C14_Profitability

C141_ Net Income

The resulting net income is greater than 0 in three of the last five years and the net income grows within a 5-year period and the enterprise can pay its debts.

The rating for this indicator is 3.

C142_Cost of Production

The enterprise knows the total costs of production nevertheless; they have not calculated the break-even point.

The rating of this indicator is 1.

C143_Price Determination

Farmers base their prices in a list approved with farmers of la Xarxeta. Nevertheless, costumers of of box schemes have special prices.

The enterprises do not use the break-even point.

The rating of this indicator is 1.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and we able to maintain some production even if environmental catastrophic events occur (hail, drought, etc.).

Networking: the enterprise is part of La Xarxeta which allows them to exchange products and buy products at lower costs being able to provide products to their customers with the same quality.

Therefore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise produces 17 species and 39 varieties of vegetables.

Furthermore, it creates an annual event which suppose an extraordinary income and the farmers give speeches and lectures.

The enterprise has conducted a risk analysis to determine its level of vulnerability versus the type and number of products, species, and varieties of plant or animal it currently produces for income generation and the result of the risk analysis does not recommend, as a priority, a greater product diversification.

The rating of the indicator is 5.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The farmer considers to have a great knowledge about the offer and can decide with who wants to do business. In consequence, if at some point they consider interesting to work with some other business they can. They consider that the inputs which are more difficult to work with different options are manure and paper (mulch).

Furthermore, the fact to work in network facilitates the exchange of materials.

The rating for this indicator is 5.

C222_Stability of Supplier Relationships

According to the approximation done by the interviewed farmer all the beneficial business relationships has remained on-going between 4 to 6 years. They have changed the supplier of irrigation system.

Therefore, more than 80% of beneficial business relations has remained on-going over the last 5 years.

The rating for this indicator is 4.

C223_Dependence on the Leading Supplier

The Enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The main income obtained is through box schemes (+50%), direct farm sales (17%) and the rest (30%) to other producers. The remaining 3% are other on-farm activities and speeches or lectures.

The rating for this indicator is 4.

C24_Liquidity

C241_Net Cash Flow

The enterprise answered the follow up question and stated that the enterprise net cash flow is above 0.

The rating for this indicator is 5.

C242_ Safety Nets

The enterprise answered the follow up question. The enterprise can have access to formal and informal financial sources (members of the box schemes, coop57 and private donors.) Nevertheless, the enterprise has not implemented any step to improve the financial security.

The rating for this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to quality of life

Farmers work around 55h per week. Therefore, overtime is compulsory and not fully compensated. Farmers has no kids therefore they consider they have enough time for the family.

The rating for this indicator is 1.

S112_Wage level

Farmers in the enterprise earn between 1200 and 650 euros per month. They consider that a living wage working 8 hours per day is 1200 euros per month.

The rating fr this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair access to means of production

9. Agricultural extension services that are regular and helpful.

No.

10. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

They assist to conferences in Escola Agraria de Manresa.

11. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.

They also assist to courses in Escola Agraria de Manresa or other places.

12. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The enterprise is part of La Xarxeta.

13. Trainings offered free of charge by major buyers.

No.

14. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

The enterprise maintains sufficient facilities.

15. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

The enterprise can maintain the storage facilities.

16. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

The enterprise has access to necessary parts.

The percentage of practises applied is 75%.

The rating of this indicator is 4.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment relations

All workers of the enterprise have a binding contract.

The rating for this indicator is 5.

S4_EQUITY

S41_Non-Discrimintation

S411_Non Discrimination

The enterprise use to hire people who has being working there previously in an internship or people who has collaborated with them. The fact that workers have a legal situation in order is an important point, because they have no knowledge and money to fix the papers.

The enterprise is a member of La Xarxeta where a non-discrimination policy is applied.

The rating for this enterprise is 5.

S42_Gender equality

S421_Gender equality

The enterprise hires anyone and does not matter if is a man or a woman. Nevertheless, none of their workers has become a mother while working.

The rating for this indicator is 5.

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

Safety and Health trainings are not provided.

The rating for this indicator is 1.

S512_Safety of Workplace, Operations and Facilities The

enterprise provides a safe, clean and healthy workplace.

The rating for this indicator is 5.

S513_Health Coverage and Access to Medical Care

The enterprise provides health coverage however does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

PGS_vallès_2
The interview with one of the farmers of PGS_vallès_2 was conducted during 17/03/2016 during 99 minutes of total recorded interview for a total of 2 hours and 30 minutes of visit. The visit included a walk around the fields.

G_GOOD GOVERNANCE

G1_CORPORATE ETHICS

G11_Mission Statement

G111_Mission Explicitness:

The mission was stated as follows: “First, work for food sovereignty to dignify the job of the smallholders. Work for the connection between consumers and the rural life through direct relation working with families and cooperatives. Second, transmit the importance of maintaining farmers through education in schools.”

The same mission is stated in the farm blog where the environmental dimension of the farm is added. The farm produces organic vegetables.

Therefore, the mission collects all the aspects of sustainability and is understood for all members.

The rating for this indicator is 5.

G112_ Mission Driven:

During our interview farmers stated that basically this mission guides all the actions the farm starts. By consulting the farm blog and public documentation the information can be

complemented. The evidence of mission in reporting is collected in the presentation of the annual balance with stakeholders (consumers). Furthermore, in the blog how the different dimensions collected in the mission are conditioning the processes are explained. Environmental: organic farming, use of traditional and local seeds. Governance: direct relationship and transparency with consumers. Social: organization of advocacy workshops. Economically: agreement on prices with consumers.

Therefore, the farm presents how the mission is affecting their key decisions and practices.

The rating of this indicator is 5.

G121_ Due Diligence:

The enterprise cannot record any policy or procedure used to assess the risk of decision taken. Even in an informal way. Nevertheless, the principles which they follow reduce the risk related with environmental issues. But there is no risk assessment.

The rating of this indicator is 1.

G2_ACCOUNTABILITY

G21_Holistic Audit

G211_Holistic Audit

The farm receives a PGS audit which was passed 2 years ago in the first round of visits.

The rating of this indicator is 4.

G22_Responsibility

G221_Responsibility

The farm checks the objectives from year to year. Results (compliance with the objectives) are presented in an annual assembly with customers with the objectives for the coming year. The results are available on internet and consider all aspects of sustainability.

The rating of this indicator is 5.

G23_Transparency

G231_Transparency

The presentation of the results each year is an important transparency policy. Furthermore, they make available a lot of the information about the processes followed in the production through social networks.

The rating of this indicator is 5.

G3_PARTICIPATION

G31_Stakeholder Dialogue

G311_Stakeholder Identification

The farmer considers stakeholders those people which consume their vegetables, people who enjoy the landscape because they take care of it, people who take benefits of their knowledge and farmers with whom they have developed a commercial relation or psychological support. The farmer using this process of identification could identify 50 % of the common stakeholders.

The rating for this indicator is 3.

G312_Stakeholder Engagement

The stakeholder which receives most of the attention in engaging them are consumers. Different mechanisms to engage them include meetings, assemblies to present results, open door day with celebration, social media and emails.

If there is the necessity of temporal workers, the option is first given to consumers of the box schemes. Therefore, workers are also engaged in decisions because they are consumers. The engagement of full-time workers is based in dialogues on evolution of the farm.

The relation with other farmers is based in La Xarxeta.

The relations with other organizations and participation of those is based on meetings. The organizations can be farmer's associations or schools.

Therefore, 100% of the identified stakeholders are engaged in the farm.

G313_Engagement Barriers:

Consumers are the considered stakeholders in this case. The main engagement barrier is the motivation of consumers to embrace the needs that short market channels require for consumers. The engagement barrier identified relates to economic aspects (organic food is more expensive than conventional) and the time required to cook the vegetables. Farmers know that some products offered require time to prepare. Nevertheless, farmers have recognized that those obstacles are not important for motivated consumers and motivation increases in direct proportion to knowledge about the enterprise. Therefore, their main strategies are based in bringing consumer closer to the fields. Furthermore, through emails and the annual assembly consumers can express their ideas and opinions.

The farms also work closely with schools and the main issue to engage schools is the price of the product. They cannot reduce more the price of the products but can receive visits from schools.

The motivation of farmers to continue the engagement was low during the time of the study. Private situations are reducing the time farmers have to motivate participation and that is reflecting on stakeholder engagement. Furthermore, the economic situation of the enterprise is not the desired and it is pushing down farmers.

Therefore, farmers are able to identify obstacles to engagement and has developed strategies. Furthermore, they are able to be critical about their performance and this is very important. Farmers are aware on what they should change about themselves however seems that personal situations do not facilitate this change. Farmers have developed strategies in 80% of the cases.

The rating of this indicator is 4.

G314_Effective Participation:

The main participation for consumers is during the annual assembly. There results of the past year and objectives for the next are presented. During assemblies consumers are encouraged to express their opinions on how things could be improved and some strategies are decided collectively. Furthermore, through weekly emails consumers can express their opinions on how things can be improved. Sometimes consumers "propose things that are impossible, we explain to them that it is impossible. Sometimes they do not have any idea of what they are talking about."

Other stakeholders with effective participation are the members of la Xarxeta. Assemblies and audits.

The enterprise can identify how decisions have been impacted by stakeholder engagement (annual objectives) and there are evidences. Furthermore, stakeholder impact is communicated back.

The rating for this indicator is 5.

G5_HOLISTIC MANAGEMENT

G51_Sustainability Management Plan

G511_Sustainability Management Plan

The enterprise does not have a written plan. Nevertheless, the fam has different objectives that aim at increasing sustainability. Farmers are verifying that every year is getting better because farmers can work less hours or can earn a better salary. The objectives are in the different dimensions of the enterprise: economic, maintain number of boxes and salaries, social, advocacy of food sovereignty and agroecology. Environmentally: maintain and conserve local varieties and improve soil fertility.

Therefore, they have an informal unwritten plan composed by different independent objectives.

The rating of this indicator is 3.

G52_Full-Cost Accounting

G522_Full-Cost Accounting

The enterprise has evidences that it collects analyze and reports to its stakeholders on its economic, social and environmental performance. Every year they have an assembly where farmers cover all the objectives of the last year and if objectives have been achieved or not and why. Furthermore, farmers present the objectives for the next year covering all dimensions of sustainability. The documents presented on the assemblies are available online.

The rating for this indicator is 3.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases

E111_GHG Reduction Target

The enterprise does not have an explicit target or a biding plan. However, farmers aim at integrating animals in the farm to be less dependent to fossil fuels.

The rating of this indicator is 1.

E112_GHG Mitigation Practices

29. Soil fertility management with organic materials and improved fertilizer application timing.

The farm uses composted cow manure, green manure and crushed trimming. Farmers apply those fertilizers during the winter. The period for composting manure is from June to January. Furthermore, “Lavinor” is used in leafy crops.

30. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

The crop rotation in the farm is 4 years and green manure is planted during fallow.

31. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic with polyculture all year-round. Furthermore, famers planted some medicinal and aromatic plants at the edges together with some trees.

32. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

The farm has soil bunds. Water harvesting is not done.

33. Incorporation of residues Framers incorporate residues

34. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes. The farmer from which they rent the tractor is in charge of it.

35. The efficiency of fixed equipment is maintained, such as refrigerated stores.

yes

36. Use of non-fossil fuel sources of energy.

no

37. Restoration of degraded lands and/or drained organic soils.

No.

38. Implementation of sound agroforestry practices.

No.

Unacceptable practices:

39. Drainage of organic soils for cultivation; OR
40. Application of high rates of nitrogen fertilizer; OR
41. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR
42. Practice of slash and burn or burning of residues.

Farmers burn residues (carton boxes).

The percentage of application of best practices is 70%. However, farmers apply one unacceptable practice. Therefore, the rating of this indicator is 1.

E121_Air Pollution Target

The enterprise does not have an explicit target or a biding plan. However, farmers aim at integrating animals in the farm to be less dependent in fossil fuels.

The rating of this indicator is 1. E122_Air

Pollution Prevention Practices Best

Practices:

9. Soil fertility management with optimized fertilizer application rates and timing (both within the season and within the day)

Farmers apply fertilizers during winter. The period for composting manure is from June to January.

10. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

Green manure is always used in fallows. Unacceptable

Practices

11. Uncontrolled or poorly managed waste incineration; OR
12. Burning of crop residues; Farmers burn carton residues.

They apply 100% of best practices but one unacceptable practice.

The rating for this indicator is 1.

E2_WATER

E21_Water Withdrawal

E211_Water Conservation Target

There is no plan or target. Nevertheless, farmers have problems of water until September when it starts to rain.

The rating for this indicator is 1.

E212_Water Conservation Practices Best

Practices:

21. Mulching and tillage to break pore continuity and reduce water evaporation from soils

Farmers use recycled paper for mulching of some crops as peas and zucchini. For other crops as tomatoes, peppers and eggplants first paper is applied and then it is covered with straw. Tillage is practiced.

22. Water harvesting No.

23. Minimization of irrigation water, such as by use of efficient irrigation technologies

For the majority of crops drip irrigation systems are used. However, for other crops as “calçot” sprinkler irrigation is used.

24. Use of soil moisture and rainfall sensors to optimize irrigation schedules The farm is using rainfall sensors.

25. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water

Yes. Nevertheless, farmers focus more in organoleptic characteristics. Use of local varieties is common.

26. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes.

27. Wastewater recycling in vegetable cleaning No.

Unacceptable Practices:

28. Inefficient or not regularly maintained irrigation systems; OR
29. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
30. Inefficient use of water for handling and processing purposes.

The farm applies 71% of best practices and no unacceptable practices are applied.

The rating for this indicator is 4.

E22_Water Quality

E221_Clean Water Target

There is no plan or target.

The rating for this indicator is 1.

E222_Water Pollution Prevention Practices Best

Practices:

19. Use of cover crops, and avoidance of bare fallows

The farm uses cover crops and there is no bare fallows. Always green manure is planted.

20. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc.; The farm is organic and polyculture is practiced.

21. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are in place.

22. Adoption of no spray buffer zones

There is areas where farmers do not spray, mainly edges.

23. Conservation tillage practices No.

24. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life

Farmers use organic pesticides accepted by the organic European legislation and do not use cupper.

25. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Yes.

Unacceptable Practices:

26. Application of pesticides that are not allowed by law; OR

27. Absence of any buffer zones to protect surface water, violation of water protection areas.

The farm applies 86% of best practices and no unacceptable practices are applied.

The rating for this indicator is 5.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

11. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

Yes. The farm uses composted cow manure, green manure and crushed trimming.

12. Wise application of mineral fertilizers to improve soil fertility No.

13. Liming to increase soil pH if acidity is present

Yes. Farmers tried some practices recommended by regenerative agriculture. Nevertheless, they could not appreciate any difference by applying rock dust.

14. Better drainage and/or subsoiling to increase nutrient availability and water retention

    Yes.

15. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

The crop rotation in the farm is 4 years.

80% of practices are followed.

The rating for this indicator is 5.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

19. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is producing organic and polyculture is practiced all year-round. Furthermore, farmers planted some medicinal and aromatic plants at the edges together with some trees.

20. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

Farmers use organic fertilizers and weeds in some cases are left until start to make seeds, then plants are cut. The idea is that some weeds attract beneficial fauna. The farm uses conservation biological control and organic pesticides are applied when necessary. Weeds are controlled using crop rotations and mechanic practices: cultivator, wheel plow and manual.

21. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

A 4-year crop rotation is followed. One of the aims of the farm is to fill all the edges with perennials and flower strips. During the open doors day farmers plant *Calendula officinalis, Alyssum L. Spp and Helianthus L spp* with consumers and use it with educational purposes.

22. Creation and maintenance of habitat networks that facilitate exchange between populations.

At the edges of the fields they plant some concrete species to attract beneficial fauna and facilitate exchange between populations.

23. Longer crop rotations, including nitrogen fixing species

A 4-year crop rotation is followed and *Fabaceae spp*. are included in the crop rotation. Furthermore, green manure with nitrogen fixing properties is used.

24. Coverage of bare ground and other soil protection measures.

Bare soil is not common. Green manure is planted.

Unacceptable Practices:

25. Annual monoculture cultivation and /or high external input livestock systems; OR
26. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR 27. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

83% of best practices are followed.

The rating for this indicator is 5.

E42_Species Diversity

E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

15. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is producing organic and polyculture is practiced all year round. Furthermore, farmers planted some medicinal and aromatic plants at the edges together with some trees.

16. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

Farmers use organic fertilizers and weeds in some cases are left until start to make seeds, then plants are cut. The idea is that some weeds attract beneficial fauna. The farm uses conservation biological control and organic pesticides are applied when necessary. Weeds are controlled using crop rotations and mechanic practices: cultivator, wheel plow and manual.

17. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

A 4 years crop rotation is followed. One of the aims of the farm is to fill all the edges with perennials and flower strips. During the open doors day they plant *Calendula officinalis, Alyssum L. Spp and Helianthus L spp* with consumers and use it with educational purposes.

18. Creation and maintenance of habitat networks that facilitate exchange between populations.

The edges of the fields are planted with some concrete species to attract beneficial fauna and facilitate exchange between populations.

19. Establishment of conservation of multi-species tree stands.

There is a mixture of plants and trees in the edges of the fields. However, bushes are not planted.

20. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

There is no conservation per se because they do not have clear which species they should conserve.

21. Installation of nesting aids.

No installation of nesting aids. Farmers incorporated wooden pillars for raptors.

57% of practices are applied.

The rating for this indicator is 3.

E424_ Diversity of Production

The farm cultivates 25 species which account for 49 different varieties in all cultivated area.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

19. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is producing organic and polyculture is practiced all year round. Furthermore, they have some medicinal and aromatic plants at the edges together with some trees.

20. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

Farmers use organic fertilizers and weeds in some cases are left until start to make seeds, then plants are cut. The idea is that some weeds attract beneficial fauna. The farm uses conservation biological control and organic pesticides are applied when necessary. Weeds are controlled using crop rotations and mechanic practices: cultivator, wheel plow and manual.

21. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

A 4-year crop rotation is followed. One of the aims of the farm is to fill all the edges with perennials and flower strips. During the open doors day they plant *Calendula officinalis, Alyssum L. Spp and Helianthus L spp* with consumers and use it with educational purposes.

22. Creation and maintenance of habitat networks that facilitate exchange between populations.

There is no conservation per se because they do not have clear which species they should conserve.

23. In-situ conservation of genetic diversity.

There is no conservation of wild genetic diversity. In reference to planned diversity farmers plant old varieties and save seeds of easy species.

Unacceptable Practices:

24. Monoculture cultivation; OR
25. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
26. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
27. All production of crops is based on a single genetic lineage.

80% of practices are applied in the farm.

The rating for this indicator is 5.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: Farmers use drip irrigation tape which have a life span of two years and it is non-recycled material (1).

Fuel: the farm runs on fossil fuels (0)

Mulch: Farmers use paper and straw. Paper is recycled and recyclable (2)

Fertilizer: Farmers use manure (waste) from nearby farms (3)

Boxes: Farmers use carton boxes (2)

Phytosanitary: Through the farm management farmers reduce the necessity of using phytosanitary. (5)

The farm applies 40% of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 3.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set.

The rating for this indicator is 1. E522_Energy

Saving Practices

11. Mainstreaming principles of sustainable energy use into strategies and operations and monitoring energy use and the structure of energy supply, if possible at process level;

No.

12. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff;

Yes. Dialogues about reducing energy consumption are common. The motivation behind it is the reduction of the costs.

13. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more enrgy efficient machinery and procedures; No.

14. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

No.

15. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

Yes. They are investing in a new storage facility.

The idea is to modify the storage facilities in the farm through a “bioconstruction project”. The farmers just pay for the material and experts and students will build it.

40 % of feasible energy-saving practices have been implemented.

The rating for this indicator is 3.

E531_Waste Reduction Target:

The farm has no plan or target set.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: Farmers use drip irrigation tape which have a life span of two years. Furthermore, they disposed in public containers which it is a bad disposal of the residues (0)

Boxes: farmers reuse the boxes. However, they burn them at the end (0).

Mulch: Farmers use paper which it is assimilated by the soil and straw which does the same (3).

Crop residue: Farmers compost them. (4)

35% of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 2.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

The enterprise investment have been very little. Machinery is the only one.

The rating of this indicator is 1.

C13_Long-ranging Investment

C131_Long Term Profitability

The enterprise investment have been very little. Machinery is the only one.

The rating of this indicator is 1.

C132_Bussines Plan

There is no business plan. Nevertheless, farmers did a study of the economic viability. According to that study they should do 120 boxes a week. There is nothing written. Therefore, the business plan is incomplete.

The rating of this indicator is 1.

C14_Profitability

C141_ Net Income

The net income is higher than 0 in every year from the last 5 and there is a tendency to grow within the 5-year period. Furthermore, the enterprise has capitalized with its own financial resources.

The rating for this indicator is 5.

C142_Cost of Production

The enterprise know their total cost of production. The enterprise does not know their breakeven point. Therefore, the price of the products is based in the market price but farmers consider they are a bit higher because they use little mechanization.

The rating for this indicator is 1.

C143_Price Determination

The enterprise uses a reference list developed by all the members of la Xarxeta. They add a mark-up to this prices. farmers consider they are subsidizing their product with their salaries.

Therefore, the enterprise does not know their break-even point.

The rating of this indicator is 1.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and we able to maintain some production even if environmental catastrophic events occur (hail, drought, etc.)

Networking: the enterprise is part of La Xarxeta which allows them to exchange products and buy products at lower costs being able to provide products to their customers with the same quality.

Nevertheless, the farm is vulnerable of difficult climatic years.

Therefore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise produces 25 species and 49 different varieties. Furthermore, they work with schools (school gardens and farm visits) in environmental and food education. The enterprise has not developed any risk assessment according to the number of crops and activities they offer.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered an input shortage and has exchanged products or let products to other farmers and vice versa. Furthermore, the enterprise has a planning with a nursery. However, they work with different nurseries depending on the crop. Furthermore, the farm has several options to purchase drip irrigation tubes, phytosanitary, boxes, fuel and mulch, however farmers prefer to work always with the same people but the relation is not close.

The rating of this indicator is 5.

C222_Stability of Supplier Relationships

The approximation by the interviewed farmer, relations with nurseries has been on-going for 8 years, with others is from 5 to 6 years. The drip irrigation system is purchased in the same shop

since the beginning and other inputs are purchased in different farmer's cooperatives with a relation longer than 5 years. Therefore, the researcher considers that the business relationships maintained on-going for the last 5 years are 100%.

The rating for this indicator is 5.

C223_Dependence on the Leading Supplier

The enterprise has not conducted a risk analysis to identify its level of vulnerability. However, it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 5.

C23_Stability of Market

C231_Stability of Market

The enterprise has different mechanisms to generate income. Box schemes, schools (meals, school gardens and visits) and also they sell products to other farmers. The box schemes are sold through consumer's associations. The main buyer is a consumer association of 40 families which is around 25 boxes from the 115 they sell every week.

All products are sold.

The rating for this indicator is 5.

C24_Liquidity

C241_Net Cash Flow

The enterprise answered the follow up question and net cash flow is above 0.

The rating for this indicator is 5.

C242_ Safety Nets

The enterprise answered the follow up question.

The financing is maintained from one source with no alternative back-up financial solution and the enterprise has not implemented any step to improve its financial security and stability.

The financial source is personal money.

The rating for this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to Quality of Life

Farmers have worked to maintain a closed Schedule. Nowadays they work 35 hours on the fields. However, office hours are not fully scheduled therefore there is not full knowledge about how many hours they work a week. Machinery has helped a lot to reduce their working hours.

They consider all workers have time to enjoy their life fully and are free from oppression however in the fields there are no sanitary facilities and farmers does not know how many hours they work falling in compulsory overtime.

The rating for this indicator is 1.

S112_Wage level

All members of the enterprise earn between 650 to 1200 euros.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair access to means of production

17. Agricultural extension services that are regular and helpful.

The enterprise used the knowledge of a technic from an ADV ("Associació de Defensa Vegetal" in 2015 but not continued during 2016)

18. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

The enterprise does not assist to trainings because they prefer to spent time with the family.

19. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.

The enterprise does not assist to courses.

20. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The enterprise is part of different farmer's organisations with periodical relation. La Xarxeta, AEG (Associació agroecologica de GAllecs, ERA (Espai de recursos Agroecologics and La Magrana Vallesana (producers and consumers association).

21. Trainings offered free of charge by major buyers.

No.

22. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

They maintain sufficient facilities. There are no impacts on production.

23. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

They do not have a cold camera which provoke some post-harvest problems specially with pumpkins.

24. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

The enterprise has access to components without risking the debt.

The percentage of practices applied is 50%.

The rating for this indicator is 3.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment Relations

Not all workers of the enterprise have a written contract.

The rating for this indicator is 1.

S4_EQUITY

S41_Non-Discrimintation

S411_Non Discrimination

Farmers (two pregnant women at the moment of the study) try to hire men to take advantage of the “male force”. Furthermore, they try to find unemployed members of consumer groups or cooperatives where they give service to. Nevertheless, there is man and woman working on the farm.

The enterprise is part of La Xarxeta therefore the policies against discrimination affect them.

The rating for this indicator is 5.

S42_Gender equality

S421_Gender equality

Farmers (two pregnant women at the moment of the study) try to hire men to take advantage of the “male force”. Furthermore, they try to find unemployed members of consumer groups or cooperatives where they give service to. Nevertheless, there is man and woman working on the farm.

The enterprise is part of La Xarxeta therefore the policies against discrimination affect them.

The rating for this indicator is 5.

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

The enterprise does not provide trainings but does not allow them to do jobs where workers have to use machinery.

The rating for this indicator is 1.

S512_Safety of Workplace, Operations and Facilities There

are no sanitary facilities on the farm.

The rating for this indicator is 1.

S513_Health Coverage and Access to Medical Care

The enterprise does not provide health coverage, does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 1.

PGS_vallès_3
The interview with the farmer PGS_vallès_3 was conducted the 30/03/2016 during 127 minutes of total recorded interview for a total of 5 hours. The visit included a walk around the fields without the farmer presence.

G_GOVERNANCE G1_CORPORATE

ETHICS

G11_Mission Statement:

G111_Mission Explicitness:

During the interview the mission was stated as "Earn money, the problem is that you do not earn enough". The farmer understands farming as business. "The fight for social justice is good, but if it is not economically viable, try another thing and stop to be a farmer." Furthermore, another important aspect is "to popularize organic food". Nevertheless, in its blog some more objectives are stated: "commercialize organic seasonal products, contribute to divulgate and consumption of local varieties, contribute to the health of consumers, producers and environment and dignify farmer life."

Therefore, the mission of the enterprise collects all dimensions of sustainability and the farmer could explain how influences. e.g. through direct sales, planting local varieties or not using pesticides.

The rating of this indicator is 5.

G112_ Mission Driven:

The enterprise is in a precarious situation. That can condition the priorities at this moment. The farmer has no written documents on how the mission is evident in codes and policies. Nevertheless, its practices are guided by its mission. Furthermore, it is able to understand how it affects negatively as "diversification of product maybe is counter-productive because it does not allow for a more professionalization and grow as an alternative system." The rating for this indicator is 3.

G121_Due Diligence:

The main risk assessment is conducted in investments and therefore economical risk on his actions. The farmer tries to invest in aspects to reduce its risk but did not consider how his actions influence others. Nevertheless, the enterprise is not considering the external impacts of its actions because is guided by principles which considers does not harm others.

There is proactive risk management. However, just tackling environmental and economic issues.

The rating of this indicator is 2.

G2_ACCOUNTABILITY

G21_Holistic Audits

G211_Holistic Audit:

The enterprise is inside the PGS. The last audit was two years ago.

The rating of this indicator is 4.

G22_ Responsibility

G221_Responsibility

The farmer does an informal assessment of performance against mission, mostly in reference to economic aspects. Nevertheless, there is no documented information about the performance. Furthermore, this information is not available for stakeholders and other aspects of sustainability are not contemplated.

The rating for this indicator is 1.

G23_Transparency

G231_Transparency:

There is weekly information disclosure about the evolution of the garden, the process followed in production, etc. However, there is no explicit requests for feedback or presentation of results on performance against mission.

The rating for this indicator is 3.

G3_PARTICIPATION

G31_Stakeholder Dialogue

G311_Stakeholder Identification

The farmer consider stakeholders the people which buy products from the farm and the people who works in the farm and organizations with are focused in commercialization of the product. The farmer was working alone at the time of the interview.

The farmer following this mechanism was able to identify 37,5 % of the common stakeholders. Therefore, the rating for the indicator is 2.

G312_Stakeholder Engagement

The mechanisms to engage identified stakeholders are:

Consumers: there is a direct relation through emails and the necessity to explain things to them is seen as an obligation for the farmer. Then there are two days a year of open doors in the farm. The farmer prepares rice and there is some theater. Furthermore, the collecting point for local customers is the farm and therefore they can see the garden.

Workers

Organizations: slow food through a forum on social media.

Therefore, the farmer has achieved satisfactory engagement with 100% of identified stakeholders.

The rating for this indicator is 5.

G313_Engagement Barriers

The main obstacles identified are in reference to consumers.

"The main issue to engage restaurants is the premium price you have to pay for organic products or the lack of constancy in the product served due to climate". Therefore, farmer has engaged in Slow food which puts in contact interested restaurants with producers.

The issue with the rest of consumers is the capacity of consumers to organize themselves. The current commercial system is very easy for consumers and the alternative the farm is proposing requires more engagement from consumers. Therefore, the farmer is trying to facilitate the delivery of products and maintain them informed about decisions, procedures and evolution of the crops and the farm. The main tools are email and social media. An issue with the email is that not all the consumers read it and therefore can be communication gaps. However, the direct communication during the delivery of the boxes permits to correct those problems.

Furthermore, to engage the local community the farmer does guided tours to the local schools free of cost. The idea is to engage those kids and their families to purchase the farm products.

The enterprise is committed to stakeholder engagement and it is able to identify potential barriers to engagement. However, its vision is much related to economic issues and engagement is perceived as more clients or facilitate the introduction of new clients. Nevertheless, the farmer explain current barriers for engagement for which has also find solutions.

The rating for this indicator is 5.

G314_Effective Participation

The main channel of communication by stakeholders is email or direct communication. He motivates customers to critic the farm performance, product quality, etc. Nevertheless, consumers are just engage about issues related to product. The farmer gives feedback on how the issues are solved by email and direct communication. There is no written documents.

Therefore, the enterprise is able to identify which decisions have been impacted by stakeholders' engagement. However, there is no gathering of those critics or improvements affected by stakeholders.

The rating of this indicator is 3.

G5_HOLISTIC MANAGEMENT

G51_Sustainability Management Plan

G511_Sustainability Management Plan

There is no written plan. The farmer collects economic information and the social sustainability plan is related with the objectives of la Xarxeta. However, there is no accounting of the values articulated in the mission.

Therefore, the rating for this indicator is 1.

G52_Full-Cost Accounting

G521_Full-Cost Accounting:

The success of the farm is measured according to economic performance. For the farmer it is represented by the amount of costumers the enterprise has or that all product cultivated is sold. There is no evidence that the farmer collects and reports to its stakeholders on its economic, social and environmental impacts.

The rating for this indicator is 1.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases

E111_GHG reduction Target

There is no target or plan. Nevertheless, the farmer considers that by producing organic and relying mostly in manual labor, the emission of greenhouse gases is reduced. The farmer sees that the main way to reduce GHG emission is to reduce fossil fuels usage.

The farmer considers that the tractor is the main GHG source of emission. Nevertheless, the farmer has knowledge that drip irrigation systems when deposited to the closest waste recycling center are burnt and therefore emit GHG.

The rating for this indicator is 1.

E112_GHG Mitigation Practices

43. Soil fertility management with organic materials and improved fertilizer application timing.

The farmer use manure and green manure (*Vicia sativa* + Vicia faba var equina). The farmer fertilizes in winter when the soil has a good “saó”.

44. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

The farm does not follow a concrete crop rotation. Just *solanacea spp* and *brassicacea spp* are controlled. Furthermore, there is bare fallows.

45. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm in polyculture.

46. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

There are soil bunds.

47. Incorporation of residues

The residues of some residues are left on the field.

48. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes.

49. The efficiency of fixed equipment is maintained, such as refrigerated stores.

Yes.

50. Use of non-fossil fuel sources of energy.

No.

51. Restoration of degraded lands and/or drained organic soils.

No.

52. Implementation of sound agroforestry practices.

No.

Unacceptable practices:

53. Drainage of organic soils for cultivation; OR
54. Application of high rates of nitrogen fertilizer; OR
55. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR
56. Practice of slash and burn or burning of residues.

The farm burns residues and edges.

The percentage of application of best practices is 60%. However, the farm is applying one unacceptable practice.

The rating of this indicator is 1.

E12_Air Quality E121_Air

Pollution Target There is

no target or plan.

The rating of this indicator is 1. E122_Air

Pollution Prevention Practices Best

Practices:

13. Soil fertility management with optimized fertilizer application rates and timing (both within the season and within the day)

The fertilization of the fields is during winter.

14. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

The farm manages bare fallows. Unacceptable

Practices

15. Uncontrolled or poorly managed waste incineration; OR
16. Burning of crop residues; The farm burns crop residues.

The farm applies 50% of best practices and one unacceptable practice.

The rating for this indicator is 1.

E2_WATER

E21_Water Withdrawal

E211_Water Conservation target There

is no plan or target.

The rating for this indicator is 1.

E212_Water Conservation Practices Best

Practices:

31. Mulching and tillage to break pore continuity and reduce water evaporation from soils Yes. The farm uses straw for mulching. The farm has issues with *Portulaca oleracea*, plants from the genus *Chenopodium, Amaranthus and Artiplex* and plants from the genus *Convolvulus.*

32. Water harvesting No.

33. Minimization of irrigation water, such as by use of efficient irrigation technologies

Drip irrigation for the majority of the crops except potatoes and “calçots” where sprinkler irrigation is used.

34. Use of soil moisture and rainfall sensors to optimize irrigation schedules No.

35. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes.

36. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes.

37. Wastewater recycling in vegetable cleaning No.

Unacceptable Practices:

38. Inefficient or not regularly maintained irrigation systems; OR
39. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
40. Inefficient use of water for handling and processing purposes.

The farm applies 57% of best practices and no unacceptable practices are applied.

The rating for this indicator is 3.

E22_Water Quality E221_Clean

Water Target There is no plan

or target.

The rating for this indicator is 1.

E222_Water Pollution Prevention Practices Best

Practices:

28. Use of cover crops, and avoidance of bare fallows There are bare fallows.

29. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc; The farm is under organic production and polyculture is practiced.

30. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are the norm.

31. Adoption of no spray buffer zones

There are areas where no pesticides are applied.

32. Conservation tillage practices No.

33. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life

The farm uses pesticides allowed under organic European legislation. The main phytosanitary used are *Bacillus turingensis* for brassica's butterfly, Bordeaux mixture and "Ferramol".

34. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Yes.

Unacceptable Practices:

35. Application of pesticides that are not allowed by law; OR
36. Absence of any buffer zones to protect surface water, violation of water protection areas.

The farm applies 71% of best practices and no unacceptable practices are followed.

The rating for this indicator is 4.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

16. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

The farmer use manure and green manure (*Vicia sativa* + Vicia faba var equina).

17. Wise application of mineral fertilizers to improve soil fertility

Yes.

18. Liming to increase soil pH if acidity is present Yes.

19. Better drainage and/or subsoiling to increase nutrient availability and water retention

    yes

20. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

No.

80% of practices considered to improve soil quality are applied in the farm.

The rating for this indicator is 5.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

28. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm and polyculture is practiced all year round.

29. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

Organic fertilizers are used and pest control is based in biological conservation. Weed control is done mechanic (cultivator) and manual wheelplow and by hand (between plants). Mulch is used. Sometimes the farmer uses some products to control concrete pests all of them organic.

30. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

Lavandula officinalis, *Rosmarinus officinalis* and *Agave americana.*

In the edges of the field

The main objectives is to enhance the beneficial flora and maintain the margins. “Here everyone adjusts the inch of land. Leave some space! Let nature do the things!”.

31. Creation and maintenance of habitat networks that facilitate exchange between populations.

No. The farm is between a matrix of cereal fields. The farmer does not see utility on it.

32. Longer crop rotations, including nitrogen fixing species There is no stipulated crop rotation. N fixing species are added.

33. Coverage of bare ground and other soil protection measures.

Bare grounds are common in the farm.

Unacceptable Practices:

34. Annual monoculture cultivation and /or high external input livestock systems; OR
35. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR 36. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

50% of best practices are applied.

The rating for this indicator is 3.

E42_Species Diversity

E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

22. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm and polyculture is practiced all year round.

23. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

Organic fertilizers are used and pest control is based in biological conservation. Weed control is done mechanic (cultivator) and manual wheel plow and by hand (between plants). Mulch is used. Sometimes the farmer uses some products to control concrete pests all of them organic.

Lavandula officinalis, *Rosmarinus officinalis* and *Agave americana.*

24. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

In the edges of the field

The main objectives is to enhance the beneficial flora and maintain the margins. “Here everyone adjusts the inch of land. Leave some space! Let nature do the things!”.

25. Creation and maintenance of habitat networks that facilitate exchange between populations.

No. The farm is between a matrix of cereal fields. The farmer does not see utility on it.

26. Establishment of conservation of multi-species tree stands.

No.

27. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

No.

28. Installation of nesting aids.

No. Birds nest in the farm infrastructures. Storehouse and porch.

43% of practices are applied.

The rating for this indicator is 3.

E424_ Diversity of Production

The farm cultivates 24 species and 48 varieties all year round.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

28. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm and polyculture is practiced all year round.

29. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

Organic fertilizers are used and pest control is based in biological conservation. Weed control is done mechanic (cultivator) and manual wheel plow and by hand (between plants). Mulch is used. Sometimes the farmer uses some products to control concrete pests all of them organic.

Lavandula officinalis, *Rosmarinus officinalis* and *Agave americana.*

30. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

In the edges of the field

The main objectives is to enhance the beneficial flora and maintain the margins. “Here everyone adjusts the inch of land. Leave some space! Let nature do the things!”.

31. Creation and maintenance of habitat networks that facilitate exchange between populations.

No. The farm is between a matrix of cereal fields. The farmer does not see utility on it.

32. In-situ conservation of genetic diversity.

The farmer saves some seeds from year to year. Wild genetic diversity is not conserved per se.

Unacceptable Practices:

33. Monoculture cultivation; OR
34. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
35. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
36. All production of crops is based on a single genetic lineage.

80% of best practices are applied.

The rating for this indicator is 5.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: The farm uses drip irrigation tape. Which is recyclable. (3)

Fuel: The farm uses fossil fuels (0)

Mulch: The farm uses straw (5)

Fertilizer: Manure is used (3)

Boxes: The farm uses recyclable plastic boxes (2)

Phytosanitary: The farm through the management reduces the necessity to use phytosanitary products (5)

The farm applies 60% of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 4.

Lavandula officinalis, *Rosmarinus officinalis* and *Agave americana.*

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set.

The rating for this indicator is 1. E522_Energy

Saving Practices

16. Mainstreaming principles of sustainable energy use into strategies and operations and monitoring energy use and the structure of energy supply, if possible at process level; There is no monitoring in the farm.

17. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff; Yes.

18. Replacing energy-intensive processes by less intensive alternatives, for example:
    shorter transport distances, reduced tillage, better isolation of buildings, more enrgy efficient machinery and procedures;

yes

19. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

No.

20. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

Yes.

60 % of feasible energy-saving practices have been implemented.

The rating for this indicator is 4.

E531_Waste Reduction Target:

The farm has no plan or target set.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: the farmer collects the drip irrigation tape and brings it to the waste management center. The farmer pays for it. Nevertheless, it is burnt with other residues (1).

Boxes: Plastic boxes are reused. (4)

Mulch: straw minimizes waste generation. However, the farmer last year had to burn it. (0)

Crop residue: It is incorporated to the field. (3)

40% of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 3.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

The main investments in the last years have been greenhouses to be able to plant before and a cold storage to preserve the products.

The enterprise has improved its sustainability performance and investments have been in that direction.

The rating for this indicator is 3.

C13_Long-ranging Investment

C131_Long Term Profitability

The enterprise has done investments that aim to generate profits over a period of at least a year as inputs. Furthermore, the enterprise has done investments that aim to generate profits over a period of at least 5 years as the cold storage and greenhouses. The enterprise has met completely its financial needs.

The rating for this indicator is 5.

C132_Bussines Plan

The enterprise does not have a business plan.

The rating of this indicator is 1.

C14_Profitability

C141_ Net Income

The enterprise does not have knowledge about its net income.

The rating is 1.

C142_Cost of Production

The enterprise does not know the total costs of production.

The rating for this indicator is 1.

C143_Price Determination

The enterprise does not know the break-even point for its products.

The rating of this indicator is 1.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and be able to maintain some production even if environmental catastrophic events occur (hail, drought, etc.)

Networking: the enterprise is part of La Xarxeta which allows them to exchange products and buy products at lower costs being able to provide products to their customers with the same quality.

Therefore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise produces 24 different species and 58 varieties. The enterprise has not developed any formal or informal risk assessment according to the number of crops grown.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered a shortage of inputs and has access to diverse procurement channels. One of the main actions is with the nurseries because they plan together the crops that the farm will need. (the farmer prepares a lot of his own seedlings.). The rest of the inputs are purchased near the farm and they maintain business relationships.

The farmer considers also fruit (sell & buy) as an input which he needs to offer in order to keep some customers.

The rating for this indicator is 5.

C222_Stability of Supplier Relationships

The farmer approximate that makes 5 years that works with its different suppliers.

The rating of this indicator is 5.

C223_Dependence on the Leading Supplier

The enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The farm sells seasonal products and complements it with exchange between farmers.

The product is sold through box schemes (20%), using an intermediary to sell to restaurants (60%) and the rest to shops and other producers.

The rating for this indicator is 4.

C24_Liquidity

C241_Net Cash Flow

The farmer did not answer the follow up question. During the interview the farmer expressed that the net cash flow is above 0 every year.

The rating for this indicator is 5.

C242_ Safety Nets

The farmer did not answer the follow up question. During the interview the farmer expressed that the enterprise has no access to formal or informal financing sources to overcome a liquidity crisis.

The rating of this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of life

S111_Right to Quality of Life

The farmer works around 60 hours per week. Furthermore, the farmer has no time to rest, recreation or to spend with the family. Therefore, overtime is compulsory and not fully compensated.

The rating for this indicator is 1.

S112_Wage level

The workers in the exploitation earn 800 euros per month. The farmer considers that 1500 euros per month.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair access to Means of Production

25. Agricultural extension services that are regular and helpful.

No.

26. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

The enterprise does not assist to trainings or vents regularly.

27. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.

The enterprise assisted to specialized trainings in tomatoes.

28. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The enterprise is part of La Xarxeta and Slow Food

29. Trainings offered free of charge by major buyers.

No.

30. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

The facilities are well maintained.

31. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

Yes. The enterprise has all the equipment necessary.

32. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

Yes.

The percentage of practices followed in the enterprise is 63%.

The rating for this indicator is 4.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment Relations

All members of the enterprise have a signed contract.

The rating for this indicator is 5.

S4_EQUITY

S41_Non-Discrimination

S411_ Non Discrimination

The farmer hires people which can develop a diversity of jobs (as required in a farm).

The enterprise is member of la Xarxeta therefore a discrimination policy affects them.

The rating for the enterprise is 5.

S42_Gender Equality

S421_Gender Equality

There are no woman working on the farm. Nevertheless, the farmer stated that he hires "whoever" ask him for a job.

The rating for this indicator is 5.

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

The enterprise does not provide trainings in safety and health.

The rating for this indicator is 1.

S512_Safety of Workplace, Operations and Facilities The

enterprise provides a clean, safe and healthy workplace.

The rating for this indicator is 5.

S513_Health Coverage and Access to Medical Care

The enterprise provides health coverage but does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

PGS_osona_1

My interview with one farmer of the PGS_osona_1 farm was conducted during 07/04/2016 in the farm during 97 minutes of recorded interview for a total of 4 hours of visit. The visit included a walk around the farm with the farmer.

G_GOOD GOVERNANCE

G1_CORPORATE ETHICS

G11_Mission Statement

G111_Mission Explicitness:

The mission stated during our interview was "to allow people who created the project to live worthily. To live from what we produce in a conscious way (organic and environmentally

friendly). To live from what we believe and we like to do." In their blog the farm states a mission which departs from following agroecology as a guide. "the farm believes in Agroecology. [The farm] believes in one agriculture which considers the ecological and socioeconomic aspects in a holistic[23] way. Sustainable from the perspective from the relation with nature, no harming, and trying to return to the earth what we take. In reference to people, ensuring the right to people to a healthy, local, agroecological diet." Finally states the values of the farm as rigor, respect and conscience. The farm has a very well stated mission in their blog which contains all aspects of sustainability.

The farmer had the capacity to explain how the influence on its work developing a bit more on the already stated strategies as local, organic, etc.

The rating for this indicator is 5 G112_Mission

Driven:

The mission is very explicit in their relation to consumers where the farm states what the farm offers and why. Especially important are the points of seasonality, market channel choices and production processes. Furthermore, the decisions in the company are taken by consensus after exposition of every member enhancing their feeling of rigor, respect and conscience. In the case of economic the right to people to a healthy diet is improved through the capacity to pay 10% of the basket with an alternative currency.[24] The following statement serves as a good summary about how mission affects the development of practices: "the values put in the mission sometimes reduce our capacity to apply some solutions that will be acceptable according to the system in which we are embedded but not in an enterprise level. Flexibility is important as principles." The rating for this indicator is 5.

G121_Due Diligence:

The first active risk management action is seeking consensus in all decisions the enterprise takes. Therefore, the members of the farm assume altogether the responsibilities. Just this actions suppose the collective reflection and assessment of possible risks and drawbacks of each decision. When consensus is not reachable, the enterprise tries to find projects where concrete decisions were taken previously in order to gain knowledge about possible risks of concrete actions.

The rating for this indicator is 4.

G2_ACCOUNTABILITY

G21_Holistic audit

G211_Holistic Audits:

The enterprise is inside the PGS. Therefore, a social auditing is used in the enterprise. During the development of the study and one week before my visit the farm received the audit. The result cannot be disclosed according to the norms of the PGS.

[23] They use the word integrated.

[24] http://ecoaltcongost.org/

Therefore, the rating of this indicator is 5.

G22_Responsibility

G221_Responsibility:

The main protocol of the enterprise is annual evaluations. They contemplate rotations, input requirements etc. Annual evaluations are developed through weekly, meetings which allows to adapt management to fulfil annual projections. The results of those meetings are compiled at the end of the year to develop an annual document. The main topics are costs, sales and crop planning. Even if, just economic indicators are used during these meetings other sustainability issues are discussed.

The rating of this indicator is 5.

G23_Transparency

G231_Transparency:

The enterprise uses internet to make the information accessible to their customers in a weekly basis through mails and the blog where more general information can be found. When there is direct relation they inform about the evolution of the enterprise. Furthermore, they use mails to do surveys and assess their performance and according to the answers adapt their decisions or decide new paths. Nevertheless, the results are not presented in a structured way as a final report available to stakeholders in a common venue where dialogue will be enhanced.

The rating of this indicator is a 3.

G3_PARTICIPATION

G31_Stakeholder Dialogue

G311_Stakeholder Identification

The farmer based the rationale in identifying stakeholders according to short marketing channels. The farmer could differentiate between two groups of stakeholders based on the relation between the enterprise and them. A first group would be composed by suppliers were it is an economic relationship and a second group where the relation is bidirectional and based in needs and offers and the cultivation of this relationship. Important stakeholders of this group are consumers, other farmers and other people related to their particular enterprise (considered not relevant for the calculation of this indicator). 50% of common stakeholders where identified.

The rating for the indicator is 3.

G312_Stakeholder Engagement

The relation with consumers is the most cultivated, different actions are developed to engage them as mail, direct relation, information on social media and an annual open doors day.

The farm has three workers and which hold weekly meetings where all of them are asked to present their opinions about the different topics of the agenda.

Other farmers: the fact to be part of la Xarxeta makes them very aware and monthly meetings are held in an assembly. The assembly of la Xarxeta have power over the decisions you take on your farm. Nevertheless, the farm has relations with other farmers.

Suppliers: it is just an economic relation but there is joint planning with nurseries about crops.

From the common stakeholders which were identified in 100% of the cases the enterprise uses appropriate mechanisms to engage.

The rating for the indicator is 5.

G313_Engagement Barriers

The farmer states that "the current commercial system and the relations on it suppose an obstacle. People is used to get their product and leave. However, it does not exist an interaction with the supplier or in this case producer. Therefore, we need a period of adaptation." The most important barrier is the inexistence of the habit to have a close commercial relationship. The farm has a period of adaptation to overcome this barrier and co-adapt (producers and consumers) to the new situation. Furthermore, people is used to standardized products. To overcome this barrier farmers, have to explain why their products are different and try to explain that physical appearances are not always synonym of good quality. Finally, the great amount of cultivated diversity or cultivated products necessitates the capacity of consumers to taste new products for the farmers to be able to provide "their consumers" with enough product all year around.

The main barriers are expressed for consumers. The farmer considers that by enhancing communication the farm is able to overcome obstacles that can arise. The strategy followed is to focus on the individual level which has brought positive effects.

The farmer was able to identify 3 barriers for engagement for stakeholders and are able to solve them all.

The rating for this indicator is 5.

G314_ Effective participation

The stakeholders with more effective participation are consumers and other farmers.

Consumers are invited to rate the performance of the enterprise through email and through the direct relation, propose improvements from their personal perspective. All information is gathered and analyzed for the governance body during the consultation period. Changes on processes or decision making are transmitted through email to consumers.

The stakeholder group of other farmers is composed by two different group of farmers. First, farmers with a commercial relationship. Farmers can influence in the measure that they visit their farms and can implement practices seen in that specific farm. However, there is no evidence that implementation of those practices is transmitted to farmers. Second, farmers from la Xarxeta. After the visit (audit) the farmers of la Xarxeta propose improvement and the farm has to accept them. All this information is collected in documents.

Therefore, we can consider that the enterprise is encouraging participation of stakeholders. Stakeholders have capacity to impact the farm and the magnitude of their impact is communicated back to them. There is documents which evidence it.

The rating for this indicator is 5.

G5_HOLISTIC MANAGEMENT

G51_Holisitc Management Plan

G511_Holistic Management Plan

The enterprise does not have a plan. However, in the annual report farmers try to cover all aspects. Therefore, farmers evaluate different objectives stated in the mission separately. The different consideration of aims has helped farmers to realize that in the social aspect the farm is still far to achieve a living wage. In the economical aspect there is a growth on sales. Environmentally the farm is in a period of transition from a multisite location to a single location and this is creating some rearrangements which will be accounted the next year. Therefore, by analyzing objective by objective farmers are able to assess the direction of the enterprise and study where does it needs to be adapted.

Therefore, the enterprise has an informal unwritten plan composed by different sustainability objectives which cover all dimensions of sustainability and some ideas have been already implemented.

The rating of this indicator is 3.

G52_Full-Cost Accounting

G522_Full-Cost Accounting

The main tool to analyze the success of the enterprise are economic indicators, for example, salaries or increment on box sold. Another aspect is the management of the crops. Therefore, they consider that a good year is a year with increase in enterprise income and good production management. Nevertheless, there is no report to its stakeholders.

Consequently, the researcher considers that they do not account for its impact and performance using any FCA regime.

The rating of this indicator is 1.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases

E111_GHG Reduction Target

There is no specific target and plan written. However, implementation of new processes or practices focus in not bringing in activities which can increase the existing emission. It is a previous decision before implementation rather than a curative solution.

Furthermore, the farm identified the tractor as the main source of emission.

The rating for this indicator is 1.

E112_GHG Mitigation practices

57. Soil fertility management with organic materials and improved fertilizer application timing.

The farm uses organic materials to maintain soil fertility as composted cow manure and crushed trimmings. The application of fertilizers is during the winter around December-January and one month later the soil is plough.

58. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

The crop rotation is 4 years. In some crops a bit more. There are problems with some pests as *Agriotes lineatus L*. therefore, it needs long crop rotations. Cover crops have been used however is not a regular practice. Bare fallows are not practiced.

59. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

60. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

The farm practice water harvesting and soil bunds are the norm.

61. Incorporation of residues

There is incorporation of residues through composting. In fields were crops with a great number of residues were planted the farmer pass with a rotating plough to incorporate it to the soil again.

62. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes. Engines are checked periodically according to the revision time.

63. The efficiency of fixed equipment is maintained, such as refrigerated stores.

Fixed equipment is also maintained.

64. Use of non-fossil fuel sources of energy.

There is no use of non-fossil fuels

65. Restoration of degraded lands and/or drained organic soils. No

66. Implementation of sound agroforestry practices.

No

Unacceptable practices:

67. Drainage of organic soils for cultivation; OR
68. Application of high rates of nitrogen fertilizer; OR
69. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR

The farm is moving from multisite location to a single location which previously was used as a graze land for cows. Therefore, the past and coming year farmers are ploughing long term grassland.

70. Practice of slash and burn or burning of residues.

Sometimes farmers burn the edges of the field. Even if it is a non-common practice is not acceptable.

The farm applies 70% of best practices. However, it is applying two unacceptable practices.

The rating of this indicator is 1.

E121_Air Pollution Target

There is no specific target and plan written. However, implementation of new processes or practices focus in not bringing in activities which can increase the existing emission. It is a previous decision before implementation rather than a curative solution.

Furthermore, the farm identified the tractor as the main source of emission.

The rating for this indicator is 1 E122_Air

Pollution Prevention Practices Best

Practices:

17. Soil fertility management with optimized fertilizer application rates and timing (both within the season and within the day)

The application of fertilizers is during the winter around December-January and one month later the soil is plough

18. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

There are no bare fallows.

Unacceptable Practices

19. Uncontrolled or poorly managed waste incineration; OR
20. Burning of crop residues; OR

Sometimes farmers burn the edges of the fields. Even if it is a non-common practice is not acceptable.

The farm applies 100% of the best practices but one unacceptable practice is applied.

The rating for this indicator is 1.

E2_WATER

E21_Water Withdrawal:

E211_Water Conservation Target:

There is no plan or set target.

The rating for this indicator is 1.

E212_Water Conservation Practices Best

Practices:

41. Mulching and tillage to break pore continuity and reduce water evaporation from soils

Farmers do not mulch, tillage is done.

42. Water harvesting

Yes, farmers have an artificial pond which collects water from a spring and from the slopes through a system of little canals.

43. Minimization of irrigation water, such as by use of efficient irrigation technologies

Farmers use drip irrigation systems.

44. Use of soil moisture and rainfall sensors to optimize irrigation schedules No.

45. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes.

46. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes.

47. Wastewater recycling in vegetable cleaning No.

Unacceptable Practices:

48. Inefficient or not regularly maintained irrigation systems; OR
49. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
50. Inefficient use of water for handling and processing purposes.

The farm applies 57% of best practices and no unacceptable practices are applied.

The rating for this indicator is 3.

E22_Water Quality

E221_Clean Water Target

There is no plan or set target. Farmers are aware of the risks of storing water in the artificial pond in the farm. The stagnation of water can provoke eutrophication due to accumulation of organic matter. Therefore, farmers are working in recirculation of water to oxygenize.

The rating for this indicator is 1.

E222_Water Conservation Practices

37. Use of cover crops, and avoidance of bare fallows

The farm does not use cover crops. However, it avoids bare fallows by leaving spontaneous vegetation.

38. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc.;

It is an organic farm and polyculture is practiced. Intercropping was practiced at the beginning but it complicates the management of crops and fields.

39. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are the norm.

40. Adoption of no spray buffer zones

There are areas permanently not sprayed, like edges and areas where natural vegetation is left. Furthermore, not all the crops are sprayed.

41. Conservation tillage practices No.

42. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life.

Farmers use organic pesticides. The farm uses mainly Bordeaux mixture for tomatoes, *Bacillus turingensis* (Bt) for brassicas and “Spinosad” (the active ingredient of SpinTor®) in potatoes.

43. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Farmers do not spray next to water courses and leave spontaneous vegetation.

Unacceptable Practices:

44. Application of pesticides that are not allowed by law; OR
45. Absence of any buffer zones to protect surface water, violation of water protection areas.

The farm applies 86% of Best practices and no unacceptable practices are applied.

The rating for this indicator is 5.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

21. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

Yes. The farm uses organic materials to maintain soil fertility as composted cow manure and crushed trimmings.

22. Wise application of mineral fertilizers to improve soil fertility No.

23. Liming to increase soil pH if acidity is present

Yes. Nevertheless, is a soil with good fertility and structure.

24. Better drainage and/or subsoiling to increase nutrient availability and water retention

    Yes.

25. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

Yes. The crop rotation is 4 years.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

37. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

38. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

The farm follows “spontaneous biological control” or “conservation biological control”. There is no installation of infrastructures for natural predators. However, there is maintenance of

natural areas to enhance the natural fauna. Weeds are controlled using mulching and rotation. However, for some weeds this is not enough therefore, the cultivator is used between rows and manual weeding between plants.

39. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

Crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea, liliacea, fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. “Before a needful crop a less demanding crop is planted.” The farm is surrounded by forest.

40. Creation and maintenance of habitat networks that facilitate exchange between populations.

The farm is surrounded by forest. However, some areas are left “natural” to enhance “biological conservation” and the connection between fields and forest (ecotones).

41. Longer crop rotations, including nitrogen fixing species

A 4-year crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea, liliacea, fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. “Before an needful crop a less demanding crop is planted.

42. Coverage of bare ground and other soil protection measures.

Spontaneous vegetation is left on the fallow fields. Bare ground is avoided.

Unacceptable Practices:

43. Annual monoculture cultivation and /or high external input livestock systems; OR
44. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR

The farm is moving from multisite location to a single location which previously was used as a graze land for cows. Therefore, the past and coming year they are ploughing long term grassland.

45. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

100% of best practices are followed. However, one unacceptable practice is applied.

The rating for this indicator is 1.

E42_Species Diversity

E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

29. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

30. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm follows "spontaneous biological control" or "conservation biological control". There is no installation of infrastructures for natural predators. However, there is maintenance of natural areas to enhance the natural fauna. Weeds are controlled using mulching and rotation. However, for some weeds this is not enough therefore, the cultivator is used between rows and manual weeding between plants.

31. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

Crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea, liliacea, fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. "Before a needful crop a less demanding crop is planted". There is no much diversity in tree stands however, the farm is surrounded by forest.

32. Creation and maintenance of habitat networks that facilitate exchange between populations.

The farm is surrounded by forest. However, some areas are left "natural" to enhance "biological conservation" and the connection between fields and forest (ecotones).

33. Establishment of conservation of multi-species tree stands.

There is no conservation of multispecies tree stands. However, there is different species of tree stands. Conservation per se is not done.

34. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

Yes. The farm is surrounded by forest and ecotones are enhanced.

35. Installation of nesting aids.

No nesting aids are installed.

71% of practices are applied.

E424_ Diversity of Production

The farm follows diverse crop rotation and has polyculture in all planted areas. The farm cultivates 30 to 40 different species which account for 90-100 varieties.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

37. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

38. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm follows "spontaneous biological control" or "conservation biological control". There is no installation of infrastructures for natural predators. However, there is maintenance of natural areas to enhance the natural fauna. Weeds are controlled using mulching and rotation. However, for some weeds this is not enough therefore, the cultivator is used between rows and manual weeding between plants.

39. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

Crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea*, *liliacea*, *fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. "Before a needful crop a less demanding crop is planted." There is no much diversity in tree stands however, the farm is surrounded by forest.

40. Creation and maintenance of habitat networks that facilitate exchange between populations.

There is no need for creation of habitat networks because the farm is surrounded by forest. However, some areas are left "natural" to enhance "biological conservation" and the connection between fields and forest (ecotones).

41. In-situ conservation of genetic diversity.

The farm does not explicitly do any activity focused on in-situ conservation of wild diversity. However, planned biodiversity is high. The farm saves some seeds. The farmer guessed about 10% of the seeds.

Unacceptable Practices:

42. Monoculture cultivation; OR
43. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests, grasslands and lakes), to arable land; OR

The farm is moving from multisite location to a single location which previously was used as a graze land for cows. Therefore, the past and coming year they are ploughing long term grassland.

44. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
45. All production of crops is based on a single genetic lineage.

100% of practices are applied. However, one unacceptable practice is followed.

The rating for this indicator is 1.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: Farmers started using soaker hose irrigation tube. After farmers pass to drip irrigation tape which degrades faster and has to be replaced more often (every two years) while farmers have had soaker hose for five years and it is still working perfectly. Farmers are changing all drip irrigation tape for soaker hose. However, it is more expensive therefore farmers phased the implementation. Therefore, the idea is to minimize wastage (4)

Fuel: It is used for the farm machinery and indirectly for the hours of tractor work (rent). Nevertheless, farmers try to optimize processes to reduce the use and dependence of it. However, the origin of fuel is fossil. Therefore, farmers acquire non-recyclable virgin material (0).

Mulch: Farmers stopped to use mulch. Farmers were using paper. (5)

Fertilizer: The farm purchases manure (waste) from a near farm, which farmers recycle back to the fields (3)

Boxes: Boxes used for harvesting and product distribution are made of recycled plastic (2)
Phytosanitary: The farm uses very few organic phytosanitary by increasing ecosystem services. Therefore, farmers minimize material input (5)

The farm applies 63 % of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 4.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set. However, the farmer considers that the baseline is already "very interesting" referred to the low amount of energy which the farm consumes. However, not coming from renewable sources.

The rating for this indicator is 1. E522_Energy

Saving Practices

21. Mainstreaming principles of sustainable energy use into strategies and operations and monitoring energy use and the structure of energy supply, if possible at process level;

The farm does not monitor energy use. However, farmers try to optimize processes and logistics to reduce the use of fossil fuels especially in distribution.

22. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff;

The farm has established dialogues about how farmers can reduce energy consumption.

23. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more energy efficient machinery and procedures;

The most important aspect is the optimization of tool usage to develop different jobs. Furthermore, when purchasing new machinery efficiency is one factor considered.

24. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

The farm does not use any modern energy service.

25. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

Yes.

60 % of feasible energy-saving practices have been implemented.

The rating for this indicator is 4.

E531_Waste Reduction Target:

The farm has no plan or target set. Farmers consider that the most important residue which the farm generates is drip irrigation tape. Farmers are immerse in a transition period which it is detailed in the next indicator.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: Farmers started using soaker hose irrigation tube. After they pass to drip irrigation tape which degrades faster and has to be replaced more often (every two years) while they have had soaker hose for five years and it is still working perfectly. Farmers are changing all drip irrigation tape for soaker hose. However, it is more expensive therefore they phased the implementation. The idea is to minimize wastage (5)

Boxes: Farmers reuse them until it is not possible. (4)

Mulch: Farmers do not use mulch. (5)

Crop residue: Is incorporated again to the field. However, some of it is also burned. Therefore, there is a bad disposal of crop residue (0).

70 % of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 4.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

In the last year the enterprise has invested in formation (business administration) through a government course ("programa consolida't"), tools to increase efficiency of jobs and renew old tools. Furthermore, the enterprise incorporated a new member as an associate with decision capacity. In the last 5 years the enterprise has invested in a greenhouse, a walking tractor and a strimmer. Furthermore, they have invested in adapting some terraces for cultivation.

According to this information we can see that the activities has prioritized the improvement of the enterprise sustainability performance and can demonstrate progress in its sustainability performance. However, they have not invested in monitoring sustainability performance beyond economic sustainability by putting in place economic indicators.

Therefore, the rating for this indicator is 3.

C13_Long-ranging Investment

C131_Long Term Profitability

In the last year the enterprise has invested in formation (business administration) through a government course ("programa consolida't"), tools to increase efficiency of jobs and renew old tools. Furthermore, they incorporated a new member to the enterprise as an associate with decision capacity. In the last 5 years the enterprise has invested in a greenhouse, a walking tractor and a strimmer. Furthermore, farmers have invested in adapting some terraces for cultivation

According to this information, investments aim to establish and reinforce the conditions to maintain, generate and increase the enterprise profits in the long-term by complementing investments which will generate profits over a period of at least a year like. The enterprise has met completely its financial needs and obligations.

The rating of this indicator is 5.

C132_Bussines Plan

The enterprise has a business plan covering strategy and objectives which are revised annually. Furthermore, farmers collect cash-flow projections and explains financial viability and how the enterprise plans to generate revenue streams. The revenue streams are controlled according to a number of weekly boxes the enterprise needs to sell. In addition, the governance of the enterprise based in consensus democracy provides all the workers with knowledge of the business plan.

The rating for this indicator is 5.

C14_Profitability

C141_ Net Income

The resulting net income is greater than 0 in three of the last five years and net income grows within 5-year period and the enterprise can pay the debts.

The rating for this indicator is 3.

C142_Cost of Production

The enterprise registers the cost incurred in the production and farmers have knowledge about fix and variable costs. Salaries are included in fix costs. Furthermore, farmers consider their product the boxes therefore, farmers count the break-even point of it. Farmers construct the break-even point by calculating the costs of each product and to later create and average cost through the year. Therefore, during the winter the price of the box is a bit higher according to the products it contains but during the summer it is cheaper or in other words, the profit margin is higher in winter and lower in summer.

The rating of this indicator is 5.

C143_Price Determination

The enterprise is aware of their break-even point and the expected profit margin to be obtained by the selling price. They recover the full-cost of unit of production and selling price results from the combination of actual costs and mark-up. They record those prices and costs.

The rating of this indicator is 5.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Water collection: the enterprise has a pond which helps to irrigate crops in drought times.

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and be able to maintain some production even if environmental catastrophic events occur (hail, drought, etc.)

Networking: the enterprise is part of La Xarxeta which allows them to exchange products and buy products at lower costs being able to provide products to their customers with the same quality.

Therefore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise produces annually 35 different species and 87 varieties of vegetables. The enterprise has not developed any formal or informal risk assessment according to the number of crops they grow.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered a shortage of inputs and has access to diverse procurement channels. One of the main actions is with the nurseries because they plan together the crops that the farm will need and the fertilizer (manure) which is purchased from a nearby farm. Furthermore, the farm has several options to purchase drip irrigation tubes, phytosanitary, boxes, fuel and mulch, however they prefer to work always with the same people.

Furthermore, the fact to work in network facilitates the exchange of materials.

The rating for this indicator is 5.

C222_Stability of Supplier Relationships

According to the approximation done by the interviewed farmer all the business relationships has remained on-going since the inception of the Enterprise in 2010. The contracts are beneficial. During the season spring-summer (2016) the Enterprise is starting to plan some seedlings with a new nursery. Therefore, the researcher considers that the business relationships maintained on-going for the last 5 years are 100%.

The rating for this indicator is 5.

C223_Dependence on the Leading Supplier

The Enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The main actions and mechanisms taken by the enterprise are around distribution. The enterprise target medium size cities in order to sell their boxes and try to find agreements with some shops (specialized organic shops) to deliver their products there. They follow the main road of the region (C-17) to facilitate the distribution. Farmers follow some marketing strategies as lending information in different villages and giving conferences. Furthermore, the enterprise has the idea to start environmental education and start to sell boxes to companies.

The product sell through boxes is 75%. (box users are asked to maintain the contract for a year). The remaining 25% is obtained from infrequent sales to local institutions in some villages, other producers and a market.

They use to sell all products.

The rating of the indicator is 5.

C24_Liquidity

C241_Net Cash Flow

The enterprise answered the follow up questions and the enterprise net cash flow is above 0.

The rating for this enterprise is 5.

C242_ Safety Nets

The enterprise answered the follow up question and considered that they have not implemented any step to improve its financial security and stability.

The rating for this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to Quality of Life

Farmers work 45h per week a year. From October to January the workload is reduced but is compensated during spring-summer. Work hours are related to the necessity to work on the land. Nevertheless, office hours are contemplated in the weekly schedule. However, in the farm there are no sanitary facilities.

The rating for this indicator is 5.

S112_Wage level

Farmers working in the enterprise are paid between 700 to 800 euros per month. Their objective and what they consider a living wage is 1500 euros.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair Access to Means of Production

33. Agricultural extension services that are regular and helpful.

The enterprise does not use extension services.

34. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

The enterprise assists to different trainings and events organized by different organisations.

35. Courses at local or online colleges, foundations, or other programmes to teach best practices and skills.

The enterprise has assisted to a government program is business administration.

36. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The enterprise is part of La Xarxeta, APA Osona (Assembly of Agroecological Farmers of Osona) and XELAC (Network of Local Economy of Alt Congost).

37. Trainings offered free of charge by major buyers.

No.

38. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

The facilities are not in perfect conditions but are not in disrepair and is not slowing down the production.

39. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

The enterprise does not have a storage facility (cold camera).

40. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

The enterprise can access to necessary parts. They are contemplated in the year investments.

The percentage of practices followed is 63%.

The rating for this indicator is 4.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment Relations

All members of the enterprise are freelance workers with a binding contract and Health care coverage.

The rating for this indicator is 5.

S4_EQUITY

S41_Non-Discrimination

S411_ Non Discrimination

They have not contracted anyone therefore there is no policy. Nevertheless, in la Xarxeta (from which they are members) discrimination for gender, ethnicity, origins, etc. are prosecuted and is a reason to be expelled from the group. Therefore, the researcher considers that there is a policy affecting.

The rating for this indicator is 5.

S42_Gender Equality

S421_Gender Equality

The enterprise will not discriminate against women for hiring according to the same reason as the previous indicator.

The rating for this indicator is 5.

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

All members of the enterprise have done all required safety and health trainings and temporary workers are oriented with basic health and safety issues.

The rating for this indicator is 5.

S512_Safety of Workplace, Operations and Facilities There

are no sanitary facilities on the farm.

The rating for this indicator is 1.

S513_Health Coverage and Access to Medical Care

The enterprise gives health coverage but does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

PGS_osona_1
My interview with one farmer of the PGS_osona_1 farm was conducted during 07/04/2016 in the farm during 97 minutes of recorded interview for a total of 4 hours of visit. The visit included a walk around the farm with the farmer.

G_GOOD GOVERNANCE

G1_CORPORATE ETHICS

G11_Mission Statement

G111_Mission Explicitness:

The mission stated during our interview was “to allow people who created the project to live worthily. To live from what we produce in a conscious way (organic and environmentally friendly). To live from what we believe and we like to do.” In their blog the farm states a mission which departs from following agroecology as a guide. “the farm believes in Agroecology. [The farm] believes in one agriculture which considers the ecological and socioeconomic aspects in a holistic[25] way. Sustainable from the perspective from the relation with nature, no harming, and trying to return to the earth what we take. In reference to people, ensuring the right to people to a healthy, local, agroecological diet.” Finally states the values of the farm as rigor, respect and conscience. The farm has a very well stated mission in their blog which contains all aspects of sustainability.

The farmer had the capacity to explain how the influence on its work developing a bit more on the already stated strategies as local, organic, etc.

The rating for this indicator is 5 G112_Mission

Driven:

The mission is very explicit in their relation to consumers where the farm states what the farm offers and why. Especially important are the points of seasonality, market channel choices and production processes. Furthermore, the decisions in the company are taken by consensus after exposition of every member enhancing their feeling of rigor, respect and conscience. In the case of economic the right to people to a healthy diet is improved through the capacity to pay 10% of the basket with an alternative currency.[26] The following statement serves as a good summary about how mission affects the development of practices: “the values put in the mission sometimes reduce our capacity to apply some solutions that will be acceptable according to the system in which we are embedded but not in an enterprise level. Flexibility is important as principles.” The rating for this indicator is 5.

G121_Due Diligence:

The first active risk management action is seeking consensus in all decisions the enterprise takes. Therefore, the members of the farm assume altogether the responsibilities. Just this actions suppose the collective reflection and assessment of possible risks and drawbacks of each decision. When consensus is not reachable, the enterprise tries to find projects where concrete decisions were taken previously in order to gain knowledge about possible risks of concrete actions.

The rating for this indicator is 4.

G2_ACCOUNTABILITY

G21_Holistic audit

G211_Holistic Audits:

[25] They use the word integrated.

[26] http://ecoaltcongost.org/

The enterprise is inside the PGS. Therefore, a social auditing is used in the enterprise. During the development of the study and one week before my visit the farm received the audit. The result cannot be disclosed according to the norms of the PGS.

Therefore, the rating of this indicator is 5.

G22_Responsibility

G221_Responsibility:

The main protocol of the enterprise is annual evaluations. They contemplate rotations, input requirements etc. Annual evaluations are developed through weekly, meetings which allows to adapt management to fulfil annual projections. The results of those meetings are compiled at the end of the year to develop an annual document. The main topics are costs, sales and crop planning. Even if, just economic indicators are used during these meetings other sustainability issues are discussed.

The rating of this indicator is 5.

G23_Transparency

G231_Transparency:

The enterprise uses internet to make the information accessible to their customers in a weekly basis through mails and the blog where more general information can be found. When there is direct relation they inform about the evolution of the enterprise. Furthermore, they use mails to do surveys and assess their performance and according to the answers adapt their decisions or decide new paths. Nevertheless, the results are not presented in a structured way as a final report available to stakeholders in a common venue where dialogue will be enhanced.

The rating of this indicator is a 3.

G3_PARTICIPATION

G31_Stakeholder Dialogue

G311_Stakeholder Identification

The farmer based the rationale in identifying stakeholders according to short marketing channels. The farmer could differentiate between two groups of stakeholders based on the relation between the enterprise and them. A first group would be composed by suppliers were it is an economic relationship and a second group where the relation is bidirectional and based in needs and offers and the cultivation of this relationship. Important stakeholders of this group are consumers, other farmers and other people related to their particular enterprise (considered not relevant for the calculation of this indicator). 50% of common stakeholders where identified.

The rating for the indicator is 3.

G312_Stakeholder Engagement

The relation with consumers is the most cultivated, different actions are developed to engage them as mail, direct relation, information on social media and an annual open doors day.

The farm has three workers and which hold weekly meetings where all of them are asked to present their opinions about the different topics of the agenda.

Other farmers: the fact to be part of la Xarxeta makes them very aware and monthly meetings are held in an assembly. The assembly of la Xarxeta have power over the decisions you take on your farm. Nevertheless, the farm has relations with other farmers.

Suppliers: it is just an economic relation but there is joint planning with nurseries about crops.

From the common stakeholders which were identified in 100% of the cases the enterprise uses appropriate mechanisms to engage.

The rating for the indicator is 5.

G313_Engagement Barriers

The farmer states that "the current commercial system and the relations on it suppose an obstacle. People is used to get their product and leave. However, it does not exist an interaction with the supplier or in this case producer. Therefore, we need a period of adaptation." The most important barrier is the inexistence of the habit to have a close commercial relationship. The farm has a period of adaptation to overcome this barrier and co-adapt (producers and consumers) to the new situation. Furthermore, people is used to standardized products. To overcome this barrier farmers, have to explain why their products are different and try to explain that physical appearances are not always synonym of good quality. Finally, the great amount of cultivated diversity or cultivated products necessitates the capacity of consumers to taste new products for the farmers to be able to provide "their consumers" with enough product all year around.

The main barriers are expressed for consumers. The farmer considers that by enhancing communication the farm is able to overcome obstacles that can arise. The strategy followed is to focus on the individual level which has brought positive effects.

The farmer was able to identify 3 barriers for engagement for stakeholders and are able to solve them all.

The rating for this indicator is 5.

G314_ Effective participation

The stakeholders with more effective participation are consumers and other farmers.

Consumers are invited to rate the performance of the enterprise through email and through the direct relation, propose improvements from their personal perspective. All information is gathered and analyzed for the governance body during the consultation period. Changes on processes or decision making are transmitted through email to consumers.

The stakeholder group of other farmers is composed by two different group of farmers. First, farmers with a commercial relationship. Farmers can influence in the measure that they visit

their farms and can implement practices seen in that specific farm. However, there is no evidence that implementation of those practices is transmitted to farmers. Second, farmers from la Xarxeta. After the visit (audit) the farmers of la Xarxeta propose improvement and the farm has to accept them. All this information is collected in documents.

Therefore, we can consider that the enterprise is encouraging participation of stakeholders. Stakeholders have capacity to impact the farm and the magnitude of their impact is communicated back to them. There is documents which evidence it.

The rating for this indicator is 5.

G5_HOLISTIC MANAGEMENT

G51_Holisitc Management Plan

G511_Holistic Management Plan

The enterprise does not have a plan. However, in the annual report farmers try to cover all aspects. Therefore, farmers evaluate different objectives stated in the mission separately. The different consideration of aims has helped farmers to realize that in the social aspect the farm is still far to achieve a living wage. In the economical aspect there is a growth on sales. Environmentally the farm is in a period of transition from a multisite location to a single location and this is creating some rearrangements which will be accounted the next year. Therefore, by analyzing objective by objective farmers are able to assess the direction of the enterprise and study where does it needs to be adapted.

Therefore, the enterprise has an informal unwritten plan composed by different sustainability objectives which cover all dimensions of sustainability and some ideas have been already implemented.

The rating of this indicator is 3.

G52_Full-Cost Accounting

G522_Full-Cost Accounting

The main tool to analyze the success of the enterprise are economic indicators, for example, salaries or increment on box sold. Another aspect is the management of the crops. Therefore, they consider that a good year is a year with increase in enterprise income and good production management. Nevertheless, there is no report to its stakeholders.

Consequently, the researcher considers that they do not account for its impact and performance using any FCA regime.

The rating of this indicator is 1.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases

E111_GHG Reduction Target

There is no specific target and plan written. However, implementation of new processes or practices focus in not bringing in activities which can increase the existing emission. It is a previous decision before implementation rather than a curative solution.

Furthermore, the farm identified the tractor as the main source of emission.

The rating for this indicator is 1.

E112_GHG Mitigation practices

71. Soil fertility management with organic materials and improved fertilizer application timing.

The farm uses organic materials to maintain soil fertility as composted cow manure and crushed trimmings. The application of fertilizers is during the winter around December-January and one month later the soil is plough.

72. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

The crop rotation is 4 years. In some crops a bit more. There are problems with some pests as *Agriotes lineatus L.* therefore, it needs long crop rotations. Cover crops have been used however is not a regular practice. Bare fallows are not practiced.

73. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

74. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

The farm practice water harvesting and soil bunds are the norm.

75. Incorporation of residues

There is incorporation of residues through composting. In fields were crops with a great number of residues were planted the farmer pass with a rotating plough to incorporate it to the soil again.

76. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes. Engines are checked periodically according to the revision time.

77. The efficiency of fixed equipment is maintained, such as refrigerated stores.

Fixed equipment is also maintained.

78. Use of non-fossil fuel sources of energy.

There is no use of non-fossil fuels

79. Restoration of degraded lands and/or drained organic soils. No

80. Implementation of sound agroforestry practices.

No

Unacceptable practices:

81. Drainage of organic soils for cultivation; OR
82. Application of high rates of nitrogen fertilizer; OR
83. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR

The farm is moving from multisite location to a single location which previously was used as a graze land for cows. Therefore, the past and coming year farmers are ploughing long term grassland.

84. Practice of slash and burn or burning of residues.

Sometimes farmers burn the edges of the field. Even if it is a non-common practice is not acceptable.

The farm applies 70% of best practices. However, it is applying two unacceptable practices.

The rating of this indicator is 1.

E121_Air Pollution Target

There is no specific target and plan written. However, implementation of new processes or practices focus in not bringing in activities which can increase the existing emission. It is a previous decision before implementation rather than a curative solution.

Furthermore, the farm identified the tractor as the main source of emission.

The rating for this indicator is 1 E122_Air

Pollution Prevention Practices Best

Practices:

21. Soil fertility management with optimized fertilizer application rates and timing (both within the season and within the day)

The application of fertilizers is during the winter around December-January and one month later the soil is plough

22. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

There are no bare fallows. Unacceptable

Practices

23. Uncontrolled or poorly managed waste incineration; OR
24. Burning of crop residues; OR

Sometimes farmers burn the edges of the fields. Even if it is a non-common practice is not acceptable.

The farm applies 100% of the best practices but one unacceptable practice is applied.

The rating for this indicator is 1.

E2_WATER

E21_Water Withdrawal:

E211_Water Conservation Target:

There is no plan or set target.

The rating for this indicator is 1.

E212_Water Conservation Practices

Best Practices:

51. Mulching and tillage to break pore continuity and reduce water evaporation from soils

Farmers do not mulch, tillage is done.

52. Water harvesting

Yes, farmers have an artificial pond which collects water from a spring and from the slopes through a system of little canals.

53. Minimization of irrigation water, such as by use of efficient irrigation technologies

Farmers use drip irrigation systems.

54. Use of soil moisture and rainfall sensors to optimize irrigation schedules No.

55. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes.

56. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes.

57. Wastewater recycling in vegetable cleaning No.

Unacceptable Practices:

58. Inefficient or not regularly maintained irrigation systems; OR
59. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
60. Inefficient use of water for handling and processing purposes.

The farm applies 57% of best practices and no unacceptable practices are applied.

The rating for this indicator is 3.

E22_Water Quality

E221_Clean Water Target

There is no plan or set target. Farmers are aware of the risks of storing water in the artificial pond in the farm. The stagnation of water can provoke eutrophication due to accumulation of organic matter. Therefore, farmers are working in recirculation of water to oxygenize.

The rating for this indicator is 1.

E222_Water Conservation Practices

46. Use of cover crops, and avoidance of bare fallows

The farm does not use cover crops. However, it avoids bare fallows by leaving spontaneous vegetation.

47. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc.;

It is an organic farm and polyculture is practiced. Intercropping was practiced at the beginning but it complicates the management of crops and fields.

48. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are the norm.

49. Adoption of no spray buffer zones

There are areas permanently not sprayed, like edges and areas where natural vegetation is left. Furthermore, not all the crops are sprayed.

50. Conservation tillage practices No.

51. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life.

Farmers use organic pesticides. The farm uses mainly Bordeaux mixture for tomatoes, *Bacillus turingensis* (Bt) for brassicas and “Spinosad” (the active ingredient of SpinTor®) in potatoes.

52. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Farmers do not spray next to water courses and leave spontaneous vegetation.

Unacceptable Practices:

53. Application of pesticides that are not allowed by law; OR
54. Absence of any buffer zones to protect surface water, violation of water protection areas.

The farm applies 86% of Best practices and no unacceptable practices are applied.

The rating for this indicator is 5.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

26. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

Yes. The farm uses organic materials to maintain soil fertility as composted cow manure and crushed trimmings.

27. Wise application of mineral fertilizers to improve soil fertility No.

28. Liming to increase soil pH if acidity is present

Yes. Nevertheless, is a soil with good fertility and structure.

29. Better drainage and/or subsoiling to increase nutrient availability and water retention

    Yes.

30. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

Yes. The crop rotation is 4 years.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

46. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

47. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

The farm follows “spontaneous biological control” or “conservation biological control”. There is no installation of infrastructures for natural predators. However, there is maintenance of natural areas to enhance the natural fauna. Weeds are controlled using mulching and rotation.

However, for some weeds this is not enough therefore, the cultivator is used between rows and manual weeding between plants.

48. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

Crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea, liliacea, fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. “Before a needful crop a less demanding crop is planted.” The farm is surrounded by forest.

49. Creation and maintenance of habitat networks that facilitate exchange between populations.

The farm is surrounded by forest. However, some areas are left “natural” to enhance “biological conservation” and the connection between fields and forest (ecotones).

50. Longer crop rotations, including nitrogen fixing species

A 4-year crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea, liliacea, fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. “Before an needful crop a less demanding crop is planted.

51. Coverage of bare ground and other soil protection measures.

Spontaneous vegetation is left on the fallow fields. Bare ground is avoided.

Unacceptable Practices:

52. Annual monoculture cultivation and /or high external input livestock systems; OR
53. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR

The farm is moving from multisite location to a single location which previously was used as a graze land for cows. Therefore, the past and coming year they are ploughing long term grassland.

54. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

100% of best practices are followed. However, one unacceptable practice is applied.

The rating for this indicator is 1.

E42_Species Diversity

E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

36. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

37. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm follows "spontaneous biological control" or "conservation biological control". There is no installation of infrastructures for natural predators. However, there is maintenance of natural areas to enhance the natural fauna. Weeds are controlled using mulching and rotation. However, for some weeds this is not enough therefore, the cultivator is used between rows and manual weeding between plants.

38. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

Crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea, liliacea, fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. "Before a needful crop a less demanding crop is planted". There is no much diversity in tree stands however, the farm is surrounded by forest.

39. Creation and maintenance of habitat networks that facilitate exchange between populations.

The farm is surrounded by forest. However, some areas are left "natural" to enhance "biological conservation" and the connection between fields and forest (ecotones).

40. Establishment of conservation of multi-species tree stands.

There is no conservation of multispecies tree stands. However, there is different species of tree stands. Conservation per se is not done.

41. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

Yes. The farm is surrounded by forest and ecotones are enhanced.

42. Installation of nesting aids.

No nesting aids are installed.

71% of practices are applied.

E424_ Diversity of Production

The farm follows diverse crop rotation and has polyculture in all planted areas. The farm cultivates 30 to 40 different species which account for 90-100 varieties.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

46. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced. There are no perennials.

47. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm follows "spontaneous biological control" or "conservation biological control". There is no installation of infrastructures for natural predators. However, there is maintenance of natural areas to enhance the natural fauna. Weeds are controlled using mulching and rotation. However, for some weeds this is not enough therefore, the cultivator is used between rows and manual weeding between plants.

48. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

Crop rotation is practiced and no synthetic herbicides are used. The rotation is based in families: *solanacea, liliacea, fabaceae* and *brassicaceae*. The other variable in account is the necessities of the crop. "Before a needful crop a less demanding crop is planted." There is no much diversity in tree stands however, the farm is surrounded by forest.

49. Creation and maintenance of habitat networks that facilitate exchange between populations.

There is no need for creation of habitat networks because the farm is surrounded by forest. However, some areas are left "natural" to enhance "biological conservation" and the connection between fields and forest (ecotones).

50. In-situ conservation of genetic diversity.

The farm does not explicitly do any activity focused on in-situ conservation of wild diversity. However, planned biodiversity is high. The farm saves some seeds. The farmer guessed about 10% of the seeds.

Unacceptable Practices:

51. Monoculture cultivation; OR
52. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests, grasslands and lakes), to arable land; OR

The farm is moving from multisite location to a single location which previously was used as a graze land for cows. Therefore, the past and coming year they are ploughing long term grassland.

53. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
54. All production of crops is based on a single genetic lineage.

100% of practices are applied. However, one unacceptable practice is followed.

The rating for this indicator is 1.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: Farmers started using soaker hose irrigation tube. After farmers pass to drip irrigation tape which degrades faster and has to be replaced more often (every two years) while farmers have had soaker hose for five years and it is still working perfectly. Farmers are changing all drip irrigation tape for soaker hose. However, it is more expensive therefore farmers phased the implementation. Therefore, the idea is to minimize wastage (4)

Fuel: It is used for the farm machinery and indirectly for the hours of tractor work (rent). Nevertheless, farmers try to optimize processes to reduce the use and dependence of it. However, the origin of fuel is fossil. Therefore, farmers acquire non-recyclable virgin material (0).

Mulch: Farmers stopped to use mulch. Farmers were using paper. (5)

Fertilizer: The farm purchases manure (waste) from a near farm, which farmers recycle back to the fields (3)

Boxes: Boxes used for harvesting and product distribution are made of recycled plastic (2)

Phytosanitary: The farm uses very few organic phytosanitary by increasing ecosystem services. Therefore, farmers minimize material input (5)

The farm applies 63 % of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 4.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set. However, the farmer considers that the baseline is already “very interesting” referred to the low amount of energy which the farm consumes. However, not coming from renewable sources.

The rating for this indicator is 1. E522_Energy

Saving Practices

26. Mainstreaming principles of sustainable energy use into strategies and operations and monitoring energy use and the structure of energy supply, if possible at process level;

The farm does not monitor energy use. However, farmers try to optimize processes and logistics to reduce the use of fossil fuels especially in distribution.

27. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff;

The farm has established dialogues about how farmers can reduce energy consumption.

28. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more energy efficient machinery and procedures;

The most important aspect is the optimization of tool usage to develop different jobs. Furthermore, when purchasing new machinery efficiency is one factor considered.

29. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

The farm does not use any modern energy service.

30. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

Yes.

60 % of feasible energy-saving practices have been implemented.

The rating for this indicator is 4.

E531_Waste Reduction Target:

The farm has no plan or target set. Farmers consider that the most important residue which the farm generates is drip irrigation tape. Farmers are immerse in a transition period which it is detailed in the next indicator.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: Farmers started using soaker hose irrigation tube. After they pass to drip irrigation tape which degrades faster and has to be replaced more often (every two years) while they have had soaker hose for five years and it is still working perfectly. Farmers are changing all drip irrigation tape for soaker hose. However, it is more expensive therefore they phased the implementation. The idea is to minimize wastage (5)

Boxes: Farmers reuse them until it is not possible. (4)

Mulch: Farmers do not use mulch. (5)

Crop residue: Is incorporated again to the field. However, some of it is also burned. Therefore, there is a bad disposal of crop residue (0).

70 % of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 4.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

In the last year the enterprise has invested in formation (business administration) through a government course ("programa consolida't"), tools to increase efficiency of jobs and renew old tools. Furthermore, the enterprise incorporated a new member as an associate with decision capacity. In the last 5 years the enterprise has invested in a greenhouse, a walking tractor and a strimmer. Furthermore, they have invested in adapting some terraces for cultivation.

According to this information we can see that the activities has prioritized the improvement of the enterprise sustainability performance and can demonstrate progress in its sustainability performance. However, they have not invested in monitoring sustainability performance beyond economic sustainability by putting in place economic indicators.

Therefore, the rating for this indicator is 3.

C13_Long-ranging Investment

C131_Long Term Profitability

In the last year the enterprise has invested in formation (business administration) through a government course ("programa consolida't"), tools to increase efficiency of jobs and renew old tools. Furthermore, they incorporated a new member to the enterprise as an associate with decision capacity. In the last 5 years the enterprise has invested in a greenhouse, a walking tractor and a strimmer. Furthermore, farmers have invested in adapting some terraces for cultivation

According to this information, investments aim to establish and reinforce the conditions to maintain, generate and increase the enterprise profits in the long-term by complementing investments which will generate profits over a period of at least a year like. The enterprise has met completely its financial needs and obligations.

The rating of this indicator is 5.

C132_Bussines Plan

The enterprise has a business plan covering strategy and objectives which are revised annually. Furthermore, farmers collect cash-flow projections and explains financial viability and how the enterprise plans to generate revenue streams. The revenue streams are controlled according to

a number of weekly boxes the enterprise needs to sell. In addition, the governance of the enterprise based in consensus democracy provides all the workers with knowledge of the business plan.

The rating for this indicator is 5.

C14_Profitability

C141_ Net Income

The resulting net income is greater than 0 in three of the last five years and net income grows within 5-year period and the enterprise can pay the debts.

The rating for this indicator is 3.

C142_Cost of Production

The enterprise registers the cost incurred in the production and farmers have knowledge about fix and variable costs. Salaries are included in fix costs. Furthermore, farmers consider their product the boxes therefore, farmers count the break-even point of it. Farmers construct the break-even point by calculating the costs of each product and to later create and average cost through the year. Therefore, during the winter the price of the box is a bit higher according to the products it contains but during the summer it is cheaper or in other words, the profit margin is higher in winter and lower in summer.

The rating of this indicator is 5.

C143_Price Determination

The enterprise is aware of their break-even point and the expected profit margin to be obtained by the selling price. They recover the full-cost of unit of production and selling price results from the combination of actual costs and mark-up. They record those prices and costs.

The rating of this indicator is 5.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Water collection: the enterprise has a pond which helps to irrigate crops in drought times.

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and be able to maintain some production even if environmental catastrophic events occur (hail, drought, etc.)

Networking: the enterprise is part of La Xarxeta which allows them to exchange products and buy products at lower costs being able to provide products to their customers with the same quality.

Therefore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise produces annually 35 different species and 87 varieties of vegetables. The enterprise has not developed any formal or informal risk assessment according to the number of crops they grow.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered a shortage of inputs and has access to diverse procurement channels. One of the main actions is with the nurseries because they plan together the crops that the farm will need and the fertilizer (manure) which is purchased from a nearby farm. Furthermore, the farm has several options to purchase drip irrigation tubes, phytosanitary, boxes, fuel and mulch, however they prefer to work always with the same people.

Furthermore, the fact to work in network facilitates the exchange of materials.

The rating for this indicator is 5.

C222_Stability of Supplier Relationships

According to the approximation done by the interviewed farmer all the business relationships has remained on-going since the inception of the Enterprise in 2010. The contracts are beneficial. During the season spring-summer (2016) the Enterprise is starting to plan some seedlings with a new nursery. Therefore, the researcher considers that the business relationships maintained on-going for the last 5 years are 100%.

The rating for this indicator is 5.

C223_Dependence on the Leading Supplier

The Enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The main actions and mechanisms taken by the enterprise are around distribution. The enterprise target medium size cities in order to sell their boxes and try to find agreements with some shops (specialized organic shops) to deliver their products there. They follow the main road of the region (C-17) to facilitate the distribution. Farmers follow some marketing strategies as lending information in different villages and giving conferences. Furthermore, the enterprise has the idea to start environmental education and start to sell boxes to companies.

The product sell through boxes is 75%. (box users are asked to maintain the contract for a year). The remaining 25% is obtained from infrequent sales to local institutions in some villages, other producers and a market.

They use to sell all products.

The rating of the indicator is 5.

C24_Liquidity

C241_Net Cash Flow

The enterprise answered the follow up questions and the enterprise net cash flow is above 0.

The rating for this enterprise is 5.

C242_ Safety Nets

The enterprise answered the follow up question and considered that they have not implemented any step to improve its financial security and stability.

The rating for this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to Quality of Life

Farmers work 45h per week a year. From October to January the workload is reduced but is compensated during spring-summer. Work hours are related to the necessity to work on the land. Nevertheless, office hours are contemplated in the weekly schedule. However, in the farm there are no sanitary facilities.

The rating for this indicator is 5.

S112_Wage level

Farmers working in the enterprise are paid between 700 to 800 euros per month. Their objective and what they consider a living wage is 1500 euros.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair Access to Means of Production

41. Agricultural extension services that are regular and helpful.

The enterprise does not use extension services.

42. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

The enterprise assists to different trainings and events organized by different organisations.

43. Courses at local or online colleges, foundations, or other programmes to teach best practices and skills.

The enterprise has assisted to a government program is business administration.

44. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The enterprise is part of La Xarxeta, APA Osona (Assembly of Agroecological Farmers of Osona) and XELAC (Network of Local Economy of Alt Congost).

45. Trainings offered free of charge by major buyers.

No.

46. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

The facilities are not in perfect conditions but are not in disrepair and is not slowing down the production.

47. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

The enterprise does not have a storage facility (cold camera).

48. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

The enterprise can access to necessary parts. They are contemplated in the year investments.

The percentage of practices followed is 63%.

The rating for this indicator is 4.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment Relations

All members of the enterprise are freelance workers with a binding contract and Health care coverage.

The rating for this indicator is 5.

S4_EQUITY

S41_Non-Discrimination

S411_ Non Discrimination

They have not contracted anyone therefore there is no policy. Nevertheless, in la Xarxeta (from which they are members) discrimination for gender, ethnicity, origins, etc. are prosecuted and is a reason to be expelled from the group. Therefore, the researcher considers that there is a policy affecting.

The rating for this indicator is 5.

S42_Gender Equality

S421_Gender Equality

The enterprise will not discriminate against women for hiring according to the same reason as the previous indicator.

The rating for this indicator is 5.

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

All members of the enterprise have done all required safety and health trainings and temporary workers are oriented with basic health and safety issues.

The rating for this indicator is 5.

S512_Safety of Workplace, Operations and Facilities There

are no sanitary facilities on the farm.

The rating for this indicator is 1.

S513_Health Coverage and Access to Medical Care

The enterprise gives health coverage but does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

CCPAE_vallès_1

The interview with one of the farmers of CCPAE_vallès_1 was conducted the 04/04/2016 during 70 minutes of total recorded interview for a total of 2 hours of visit. A walk by the researcher was done through the fields without the presence of the farmers.

G_GOVERNANCE

G1_CORPORATE ETHICS

G11_Mission Statement:

G111_Mission Explicitness

The stated mission is "to provide fresh product to schools, allow kids to eat healthy vegetables and be able one day to live from it." Nevertheless, there is no explanation about how it influences. There is no blog or website which explains more in depth the mission.

The rating of this indicator is 1, because the producers can articulate a mission which does not addresses sustainability.

G112_ Mission driven:

The impact on the mission in developing practice is evident, thus the enterprise produces organic. Nevertheless, the farmer could not argument. The important point for him was the high quality of the product served to schools. Nevertheless, no examples were given.

The rating of this indicator is 1.

G121_Due Diligence:

The farmer just gives examples on the crop planning (rotations). Therefore, there is no evidence of proactive risk assessment in other aspects of sustainability.

The rating of this indicator is 1.

G2_ACCOUNTABILITY

G21_Holistic Audit

G211_Holistic audit:

The enterprise does not use any sustainability reporting on farm.

The rating for this indicator is 1.

G22_Responsibility

G221_Responsibility

There is no evaluation of performance against mission with appropriate stakeholder input.

The rating for this indicator is 1.

G23_Transparency

G231_Transparency:

There is no policy explaining how the information is made available. The relation between schools and the farm is a shared document stating the available products and the schools demand according to this offer. The trust system is the CCPAE certification. The rating of this indicator is difficult because the farm does not deliberately withhold information. Nevertheless, it does not assess their performance against mission or makes information available for their stakeholders beyond the official certification. However, the rating scale should consider that the farm transparency performance is low and therefore, the lowest punctuation gives a better understanding of the transparency of the farm according to the rest of farms assessed.

The rating of this indicator is 1.

G3_PARTICIPATION

G31_ Stakeholder Dialogue

G311_ Stakeholder Identification

The mechanism used by the farmer to identify stakeholders is the commercial relation and common practices.

Using this mechanism, the farm could identify 25 % of common stakeholders.

The rating of this indicator is 1.

G312_Stakeholder Engagement:

Workers: It is a family business therefore, father and son are engaged.

Other farmers: the enterprise are part of a SAT, and the enterprise follow the participation norms of the SAT.

Therefore, the enterprise has achieved satisfactory engagement with 100% of the identified stakeholders.

The rating of this indicator is 5.

G313_ Engagement Barriers:

The engagement barriers for stakeholders were understood for the farmer as the lack of capacity to hire another worker.

Therefore, the enterprise is unable to identify and act upon more than two barriers The

rating of this indicator is 1.

G314_ Effective Participation:

The farmer tries to include what the schools say. The main participation channel is a shared document about the necessities of each school. Nevertheless, communication is reduced to this.

It is a difficult case to rate, because of the low information available. However, lack of information is considered as non-existence of the practice therefore, the enterprise is unable to demonstrate that its stakeholder engagement has genuinely affected the decisions it has made.

The rating for this indicator is 1.

G5_HOLISTIC MANAGEMENT

G51_Sustainability Management Plan

G511_Sustainability Management Plan

There is no plan and the values explained in the mission does not contemplate values on the four pillars of sustainability.

The rating of this indicator is 1.

G52_Full-Cost Accounting

G521_Full-Cost Accounting

The enterprise measures success based on the number of costumers the farm has and their loyalty.

Therefore, the farm does not account for their performance or impact using any FCA regime.

The rating of this indicator is 1.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases

E111_GHG Reduction Target

The farm does not have a plan or a target.

The rating for this indicator is 1.

E112_GHG Mitigation Practices

85. Soil fertility management with organic materials and improved fertilizer application timing.

The farm uses manure. The manure is not organic (accepted in organic regulation) because there is not enough organic livestock to fulfil the demand. Farmers fertilize in winter and depending on the next crop.

86. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

Farmers do not have a structured crop rotation. “It depends”.

87. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

The farm is organic and polyculture is practiced.

88. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

The farm has soil bunds. There is no water harvesting.

89. Incorporation of residues

Farmers compost organic residues and apply them at the same time with manure.

90. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes.

91. The efficiency of fixed equipment is maintained, such as refrigerating stores.

Yes.

92. Use of non-fossil fuel sources of energy.

No.

93. Restoration of degraded lands and/or drained organic soils.

No.

94. Implementation of sound agroforestry practices.

No.

Unacceptable practices:

95. Drainage of organic soils for cultivation; OR
96. Application of high ratings of nitrogen fertilizer; OR
97. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR
98. Practice of slash and burn or burning of residues.

The farmer applies 60% of best practices and any unacceptable practice. Therefore, the rating for this indicator is 4.

E12_Air Quality

E121_Air Pollution Target

The farm does not have a plan or a target.

The rating for this indicator is 1. E122_Air

Pollution Prevention Practices Best

Practices:

25. Soil fertility management with optimized fertilizer application ratings and timing (both within the season and within the day)

Farmers fertilize in winter and depending on the next crop.

26. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

Farmers ploughs the fields in fallow.

Unacceptable Practices

27. Uncontrolled or poorly managed waste incineration; OR
28. Burning of crop residues;

The farm applies 50% of best practices.

The rating for this indicator is 3.

E2_water

E21_Water Withdrawal E211_Water

Conservation target There is no plan

or target set.

The rating of this indicator is 1.

E212_Water Conservation Practices Best

Practices:

61. Mulching and tillage to break pore continuity and reduce water evaporation from soils

No mulch is used. Tillage is practiced.

62. Water harvesting No.

63. Minimization of irrigation water, such as by use of efficient irrigation technologies The farm uses drip irrigation systems and sprinklers.

64. Use of soil moisture and rainfall sensors to optimize irrigation schedules No.

65. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes.

66. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes.

67. Wastewater recycling in vegetable cleaning No.

Unacceptable Practices:

68. Inefficient or not regularly maintained irrigation systems; OR
69. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
70. Inefficient use of water for handling and processing purposes.

43% of best practices are applied in the farm. No unacceptable practices are applied.

The rating of this indicator is 3.

E22_Water Quality

E221_Clean Water Target There

is no plan or target set.

The rating of this indicator is 1.

E222_Water Pollution Prevention Practices Best

Practices:

55. Use of cover crops, and avoidance of bare fallows

The farm does not plant cover crops, fallows are left with spontaneous vegetation but are plough.

56. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc; The farm is under organic cultivation and polyculture is practiced.

57. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are the norm.

58. Adoption of no spray buffer zones Yes. Edges.

59. Conservation tillage practices No.

60. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life

The farm uses accepted products. SpinTor® and Bacillus Turingensis are used.

61. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Yes.

Unacceptable Practices:

62. Application of pesticides that are not allowed by law; OR

63. Absence of any buffer zones to protect surface water, violation of water protection areas.

71% of best practices are applied. No unacceptable practices are applied.

The rating for this indicator is 4.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

31. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

Yes. . The farm uses manure. The manure is not organic (accepted in organic regulation) because there is not enough organic livestock to fulfil the demand.

32. Wise application of mineral fertilizers to improve soil fertility No.

33. Liming to increase soil pH if acidity is present Yes.

34. Better drainage and/or subsoiling to increase nutrient availability and water retention

Yes.

35. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

No. Farmers do not have a structured crop rotation. “It depends”.

60% of practices considered to enhance soil quality are applied in the farm.

The rating for this indicator is 4.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials,

-round and in all fields.

55. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control

forest gardens, etc.

It is an organic farm and polyculture is practiced all year

56. (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

The farm follows conservation biological control. Weed management is done through rotation and manual.

57. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

The farm follows a crop rotation and does not uses synthetic herbicides. Wild flower strips are planted some years. However, it is not a common practice. Edges are maintained with wild vegetation.

58. Creation and maintenance of habitat networks that facilitate exchange between populations.

No.

59. Longer crop rotations, including nitrogen fixing species Yes.

60. Coverage of bare ground and other soil protection measures.

No.

Unacceptable Practices:

61. Annual monoculture cultivation and /or high external input livestock systems; OR
62. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR 63. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

67% of best practices are applied in the farm.

The rating for this indicator is 4.

E42_Species Diversity

Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials,

-round and in all fields.

Use of ecological approaches in tillage, soil fertility and disease, pest and weed control E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

43.

forest gardens, etc.

It is an organic farm and polyculture is practiced all year

44.

(e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm follows conservation biological control. Weed management is done through rotation and manual.

45. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

The farm follows a crop rotation and does not uses synthetic herbicides. Wild flower strips are planted some years. However, it is not a common practice. Edges are maintained with wild vegetation.

46. Creation and maintenance of habitat networks that facilitate exchange between populations.

No

47. Establishment of conservation of multi-species tree stands.

No

48. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

Yes.

49. Installation of nesting aids.

No.

Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials,

-round and in all fields.

Use of ecological approaches in tillage, soil fertility and disease, pest and weed control 57 % of practices are followed in the farm.

The rating of this indicator is 3.

E424_ Diversity of Production

19 species are cultivated and 30 varieties.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

55.

forest gardens, etc.

It is an organic farm and polyculture is practiced all year

56.
(e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm follows conservation biological control. Weed management is done through rotation and manual.

57. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

The farm follows a crop rotation and does not uses synthetic herbicides. Wild flower strips are planted some years. However, it is not a common practice. Edges are maintained with wild vegetation.

58. Creation and maintenance of habitat networks that facilitate exchange between populations.

No

59. In-situ conservation of genetic diversity.

The farm saves some seeds from year to year and is involved in seed exchange with other farmers.

Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials,

-round and in all fields.

Use of ecological approaches in tillage, soil fertility and disease, pest and weed control Unacceptable Practices:

60. Monoculture cultivation; OR
61. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
62. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc.; OR
63. All production of crops is based on a single genetic lineage.

80% of best practices are followed in the farm.

The rating of this indicator is 5.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: Drip irrigation tape is used (1)

Fuel: Fossil fuels are used (0)

Mulch: No use of mulch (5)

Fertilizer: The farm uses manure from a nearby farm (3).

Boxes: The farm uses non-recycled plastic boxes (1)

Phytosanitary: The farm through the management reduces the necessity to use phytosanitary products (5)

The farm applies 50% of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 3.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set.

The rating for this indicator is 1. E522_Energy

Saving Practices

31. Mainstreaming principles of sustainable energy use into strategies and operations and monitoring energy use and the structure of energy supply, if possible at process level; No.
32. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff; Yes.
33. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more energy efficient machinery and procedures; Yes. Water system.
34. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

Yes. wind energy and solar panels.

35. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

Yes. Water system.

80 % of feasible energy-saving practices have been implemented.

The rating for this indicator is 5.

E531_Waste Reduction Target:

The farm has no plan or target set.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: It is brought to the waste management center (1)

Boxes: The boxes are reused (4)

Mulch: No mulching is used (5)

Crop residue: It is composted (3)

65 % of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 4.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

The enterprise main investments are in machinery in order to reduce manual labor. Therefore, the enterprise had not implemented any investment practice in the last 5 years aimed at monitoring and improving its sustainability performance.

The rating of this indicator is 1.

C13_Long-ranging Investment

C131_Long Term Profitability

The enterprise has not done any investment that aim to generating profits over a period of at least 5 years.

The rating of this indicator is 1.

C132_Bussines Plan

The enterprise does not have a business plan; always sell all products.

The rating for this indicator is 1.

C14_Profitability

C141_ Net Income

The enterprise has no knowledge of the net income.

The rating of the indicator is 1.

C142_Cost of Production

The enterprise does not know their cost of production or the break–even point of each product.

The rating of this indicator is 1.

C143_Price Determination

The price is based in intuition and experience. Farmers have a fixed price the whole year round. They do not know the break-even point of each product.

The rating for this indicator is 1.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and we able to maintain some production even if environmental catastrophic events occur (hail, drought,...)

Therfore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise grows 19 species and 30 varieties of vegetables. Furthermore the enterprise grows legumes and cereals.

The enterprise has not developed any formal or informal risk assessment according to the number of crops they grow.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered a shortage of inputs and has access to diverse procurement channels.

The rating for this indicator is 5.

C222_Stability of Supplier Relationships

According to the approximation done by the interviewed farmer all the business relationships are long time relationships. (time was not specified, however, according to the time the enterprise has been active probably is more than 5 years).

The rating for this indicator is 5.

C223_Dependence on the Leading Supplier

The Enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The enterprise has not approximated numbers of the quantity of product sold. The farm sells its products direct on the farm ("calçot", tomatoes and Peppers) and the rest of the production to school's meals and to the shop of the cooperative which they are part of. Percentages are not provided however farmer said the majority is sold to schools. Therefore, the researcher considered that the schools buy 60% through this channel.

The enterprise sells all its product.

The rating for this indicator is 4.

C24_Liquidity

C241_Net Cash Flow

The farm has a positive net cash flow.

The rating for this indicator is 5.

C242_ Safety Nets

The farmer has not implemented and step to improve their financial security.

The rating for this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to Quality of Life

Farmers work around 10 hours per day. Therefore, farmers work more than the 40 to 48hours considered quality of life. Therefore, overtime is compulsory and not fully compensated. Farmers consider they do not have much time for the family.

The rating for this indicator is 1.

S112_Wage level

The farmer considers that a living wage is 1500 euros. They are earning between 650 to 1200 euros per month.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair Access to Means of Production

49. Agricultural extension services that are regular and helpful.

No.

50. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

No.

51. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.

No.

52. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The enterprise is part of a farmer cooperative where they exchange knowledge.

53. Trainings offered free of charge by major buyers.

No.

54. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

Yes.

55. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

Yes.

56. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

Yes.

The percentage of practices followed is 50% The

rating for this indicator is 3.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment Relations

Not all members (father and son) have a binding contract. The son is freelance and the father is a pensioner however it is still working in the enterprise.

The rating for this indicator is 1.

S4_EQUITY

S41_Non-Discrimintation

S411_ Non Discrimination

They hire people with previous knowledge on farming. Therefore, there is no policy.

The rating for this indicator is 3.

S42_Gender Equality

S421_Gender Equality

There are no women working on the farm at the moment of the study. Nevertheless, they had women working. None of them got pregnant.

The rating for this indicator is 5.

S43_Support to Vulnerable People

S431_Support to vulnerable people

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

The enterprise does not provide safety and Health trainings.

The rating for this indicator is 1.

S512_Safety of Workplace, Operations and Facilities There

is a safe and clean workplace.

The rating is 5.

S513_Health coverage and access to Medical care

The enterprise offers Health coverage but does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

CCPAE_vallès_2

The interview with one of the farmers of CCPAE_vallès_2 was conducted the 21/03/2016 during 69 minutes of recorded interview for a total of 2 hours visit. A walk around the fields was done with the farmer.

G_GOVERNANCE G1_CORPORATE

ETHICS

G11_Mission Statement:

G111_Mission Explicitness

The mission stated during the interview was “Try to live worthily. Try to change our environment by the way we work the land. Provide consumers with organic food of the area.” In their website the same mission is collected. The influences are stated in the website like the way they work the land, organic agriculture, seasonality, pest management.

Therefore, the mission is based in environmental, economic and health aspects Therefore, it covers some aspects of sustainability. Nevertheless, it is vague.

The rating for this indicator is 3.

G112_ Mission Driven:

The way the mission influences the enterprise activities are evident in the practices used to fulfil the mission as organic agriculture, short marketing channels and seasonality. The enterprise can identify the influence of the mission sustainability commitment in some aspects.

The rating for this indicator is 3.

G121_Due Diligence:

There exists a dialogue about decisions done in an assembly. They are able to give examples about decisions. One example is the implementation of greenhouses, where discussions were about plastic and its origin in oil but also about how they gain capacity to "survive" during the winter.

Nevertheless, there are just covering the environmental aspects in investments. Not in procedures or others. Therefore, the enterprise is proactive in risk management but not in all areas of sustainability.

The rating for this indicator is 2.

G2_ACCOUNTABILITY

G21_Holistic Audit

G211_Holistic Audits

The enterprise does not receive any sustainability audit.

The rating of this indicator is 1.

G22_Responsibility:

G221_Responsibility:

The enterprise reviews the economic performance of the farm after the summer season (the most important one in vegetable market) where maximum volume and products are sold. Furthermore, every month and a half the governance body meets to share the progress on the areas which they are in charge. However, there is strong focus on economic growth of the enterprise. The documents are written down. No other relevant stakeholders are involved in any way during this process.

The rating of this indicator is 1.

G23_Transparency

G231_Transparency:

The enterprise has no open policies on request of information. Nevertheless, in their social network profile the farm explains the evolution of the crops. However, there is no disclose of more sensible information in a direct basis or the stakeholders are engaged in a regular basis with direct affection on the farm processes.

The rating of this indicator is 1.

G3_PARTICIPATION

G31_Stakeholder Dialogue

G311_ Stakeholder Identification

They do not have any procedure to identify stakeholders. However, they consider just consumers as stakeholders.

Therefore, just 13% of the common stakeholders were identified.

The rating of this indicator is 1.

G312_ Stakeholder Engagement:

Consumer: Social media are the main tool used to engage consumers. The manager explains the evolution of the garden and activities being developed. The manager admits that since there is the farm facebook page the business started to grow and more people got to know them.

They achieved satisfactory engagement with 100% of the identified stakeholders.

The rating of this indicator is 5.

G313_Engagement Barriers:

The main engagement barrier is with consumers and specially restaurants. Restaurants ask for products which the farm cannot provide, “you recognize that they do not know about farming”. To solve this issue, the farm has private meetings with the restaurants.

Therefore, the farm cannot identify more than two barriers.

The rating for this indicator is 1.

G314_Effective Participation:

The area of stakeholder participation is related to product planted. Stakeholders just have impact on crops. Furthermore, there is no explanation to stakeholders about the impact of their engagement.

Therefore, the enterprise fails to inform stakeholders of the outcome of engagement.

The rating of this indicator is 1.

G5_HOLISTIC MANAGEMENT

G51_Sustainability Management Plan

G511_Sustainability Management Plan

There is no written plan and the objectives stated in the mission are a bit vague. Even if the organization can articulate the values a plan may address in some pillars of sustainability does not consider all. Therefore, the plan does not address each of the four sustainability pillars.

The rating of this indicator is 1.

G52_Full-Cost Accounting

G521_Full-Cost Accounting

The main measure is profit. However, the farm also accounts for the production process and crop time. Furthermore, farmers also value that stakeholders recognize their job.

Therefore, the enterprise does not account for its impact and performance using any FCA regime.

The rating of this indicator is 1.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases E111_GHG

Reduction Target

There is no target or plan.

Farmers consider as sources of GHG emissions direct effects as tractor or equipment and indirect like plastic of the greenhouses.

The rating of this indicator is 1.

E112_GHG Mitigation Practices

99. Soil fertility management with organic materials and improved fertilizer application timing.

The fam uses cow manure and crushed trimmings.

100. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

4-year rotation is followed with bare fallows.

101. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

The farm produces organic and polyculture.

102. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

There are soil bunds.

103. Incorporation of residues The farm incorporates residues.

104. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes, because it reduces expenses.

105. The efficiency of fixed equipment is maintained, such as refrigeratingd stores.

Yes.

106. Use of non-fossil fuel sources of energy.

No.

107. Restoration of degraded lands and/or drained organic soils.

No.

108. Implementation of sound agroforestry practices.

No.

Unacceptable practices:

109. Drainage of organic soils for cultivation; OR
110. Application of high ratings of nitrogen fertilizer; OR
111. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR
112. Practice of slash and burn or burning of residues.

The farm follows 60% of best practices and any unacceptable practice. Therefore, the rating of this indicator is 4.

E12_Air Quality

E121_Air Pollution Target There

is no target or plan.

The rating for this indicator is 1. E122_Air

Pollution Prevention Practices Best

Practices:

29. Soil fertility management with optimized fertilizer application ratings and timing (both within the season and within the day)

farmers fertilize during winter.

30. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

Bare fallows are used in order to combat EL CUC DEL FILFERRO.

Unacceptable Practices

31. Uncontrolled or poorly managed waste incineration; OR
32. Burning of crop residues;

They apply 50% of best practices.

The rating for this indicator is 3.

E2_WATER

E21_Water Withdrawal E211_Water

Conservation target There is no set

target or plan.

The rating for this indicator is 1.

E212_Water Conservation Practices Best

Practices:

71. Mulching and tillage to break pore continuity and reduce water evaporation from soils

They use paper, biodegradable plastic and straw.

72. Water harvesting No.

73. Minimization of irrigation water, such as by use of efficient irrigation technologies

Sprinklers and drip irrigation systems.

74. Use of soil moisture and rainfall sensors to optimize irrigation schedules

Yes.

75. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes.

76. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes

77. Wastewater recycling in vegetable cleaning No.

Unacceptable Practices:

78. Inefficient or not regularly maintained irrigation systems; OR
79. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
80. Inefficient use of water for handling and processing purposes.

71% of best practices are used. No unacceptable practices are applied.

The rating of this indicator is 4.

E22_Water Quality

E221_Clean Water Target There

is no set target or plan.

The rating of this indicator is 1.

E222_Water Pollution Prevention Practices Best

Practices:

64. Use of cover crops, and avoidance of bare fallows The farms have bare fallows.

65. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc; The farm is under organic production and polyculture is practiced.

66. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are the norm.

67. Adoption of no spray buffer zones No.

68. Conservation tillage practices No.

69. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life

Yes. They use the allowed pesticides by European law regulating organic production.

70. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips No.

Unacceptable Practices:

71. Application of pesticides that are not allowed by law; OR

72. Absence of any buffer zones to protect surface water, violation of water protection areas.

There is no buffer zones next to the stream running next to the fields. It is a possible are of water contamination.

57% of best practices are applied in the farm. One unacceptable practice is followed.

The rating fro this indicator is 1.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

36. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

Yes. Farmers use cow manure and crushed trimmings.

37. Wise application of mineral fertilizers to improve soil fertility No.

38. Liming to increase soil pH if acidity is present Yes.

39. Better drainage and/or subsoiling to increase nutrient availability and water retention

Yes.

40. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

No. Farmers follow a 4-year rotation but use have bare fallows.

60% of practices considered to enhance soil quality are applied in the farm.

The rating for this indicator is 4.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

64. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm and polyculture is practiced.

65. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

Pest management is based in conservation biological control. Weed management is mechanic or manual.

66. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

The farm follows a diverse crop rotation and wild flower strips are present. (calendula and ALYSUM)

67. Creation and maintenance of habitat networks that facilitate exchange between populations.

No.

68. Longer crop rotations, including nitrogen fixing species Yes.

69. Coverage of bare ground and other soil protection measures.

No.

Unacceptable Practices:

70. Annual monoculture cultivation and /or high external input livestock systems; OR
71. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR 72. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

67% of best practices are applied in the farm.

The rating of this indicator is 4.

E42_Species Diversity

E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

50. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm and polyculture is practiced.

51. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

Pest management is based in conservation biological control. Weed management is mechanic or manual.

52. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

The farm follows a diverse crop rotation and wild flower strips are present.

53. Creation and maintenance of habitat networks that facilitate exchange between populations.

No.

54. Establishment of conservation of multi-species tree stands.

No.

55. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

No.

56. Installation of nesting aids.

No.

43% of practices are applied in all farm.

The rating for this indicator is 3.

E424_ Diversity of Production

The farm cultivates 28 species and 50 varieties.

The rating of this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

64. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm and polyculture is practiced.

65. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

Pest management is based in conservation biological control. Weed management is mechanic or manual.

66. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

The farm follows a diverse crop rotation and wild flower strips are present.

67. Creation and maintenance of habitat networks that facilitate exchange between populations.

No.

68. In-situ conservation of genetic diversity.

Some species are saved from year to year and local varieties are planted.

Unacceptable Practices:

69. Monoculture cultivation; OR
70. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
71. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
72. All production of crops is based on a single genetic lineage 80% of best practices are applied in the farm.

The rating for this indicator is 5.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: Drip irrigation tape is used (1)

Fuel: Fossil fuels are used (0)

Mulch: Paper, biodegradable plastic and straw (2)

Fertilizer: The farm uses manure from a nearby farm (3).

Boxes: Recycled plastic (2)

Phytosanitary: The farm through the management reduces the necessity to use phytosanitary products (5)

The farm applies 43% of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 3.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set.

The rating for this indicator is 1. E522_Energy

Saving Practices

36. Mainstreaming principles of sustainable energy use into stratinggies and operations and monitoring energy use and the structure of energy supply, if possible at process level; Yes. Farmers monitor the energy consumption.

37. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff;

No. There is no proper discussion.

38. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more enrgy efficient machinery and procedures; Yes. Machinery.

39. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

No.

40. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

No.

40% of feasible energy-saving practices have been implemented.

The rating for this indicator is 3.

E531_Waste Reduction Target:

The farm has no plan or target set.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: A company is coming an recycling it (3)

Boxes: Farmers reuse the plastic boxes (4)

Mulch: farmers recycle it (3)

Crop residue: farmers compost or incorporate it. (3)

65% of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 4.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

The enterprise has invested in improving the efficiency. Farmers consider that they have not invested in anything on sustainability. However, they invested in greenhouses and wells. Therefore, the enterprise has invested in improving its sustainability and has progresses in its sustainability performance.

The rating of this indicator is 3.

C13_Long-ranging Investment

C131_Long Term Profitability

The enterprise has done investment to generating profits at least over a period of at least 5 years. For instance the greenhouse and wells.

The rating of the indicator is 3.

C132_Bussines Plan

The enterprise has a business plan. However, no detail was given.

The rating of this indicator is 1.

C14_Profitability

C141_ Net Income

The enterprise does not know the net income.

The rating of this indicator is 1.

C142_Cost of Production

The enterprise does know the total cost of production but not the break-even point for each product.

The rating of this indicator is 1.

C143_Price Determination

The break-even point is not used to establish the price of each product.

The rating of this indicator is 1.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and be able to maintain some production even if environmental catastrophic events occur (hail, drought, etc.)

Therefore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise produces 28 species and 50 different varieties of vegetables. The enterprise has not developed any formal or informal risk assessment according to the number of crops they grow.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered a shortage of inputs and has access to diverse procurement channels. Farmers consider to have different options to purchase their inputs.

The rating for this indicator is 5.

C222_Stability of Supplier Relationships

According to the approximation done by the farmer some of the business relationships has remained on-going since the inception of the Enterprise in 2012. Therefore, the researcher considers that more than 80% of the beneficial business relationships has remained on-going.

The rating for this indicator is 4.

C223_Dependence on the Leading Supplier

The Enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The main sales are in a farmer market and through box schemes (30% each). The enterprise also sells to restaurants; the farm is member of slow food. However, percentage of product sold were not provided. Information about the rest of the sales was not provided.

All products are sold.

The rating for this indicator is 5.

C24_Liquidity

C241_Net Cash Flow

The enterprise did not answer the follow up question. The enterprise has a positive net cash flow.

The rating for this indicator is 5.

C242_ Safety Nets

The enterprise has not implemented any step to improve their financial security.

The rating for this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to quality of life

They have different schedules depending on the season but they work around 54hours per week. They consider not to have enough time for the family and it is a topic of discussion in the family. Therefore, overtime is compulsory and not fully compensated.

The rating for this indicator is 1.

S112_Wage level

The workers of the enterprise earn from 650 euros to 1200.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair access to means of production

57. Agricultural extension services that are regular and helpful.

Yes. The hire a technician.

58. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

There was no mention about conferences.

59. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.

No mention of courses.

60. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The enterprise has good relation with other farmers and is part of some farmer's organisations nevertheless they were not specified during our interview.

61. Trainings offered free of charge by major buyers.

No.

62. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

Yes.

63. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

Yes.

64. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

Yes.

The percentage of practices followed is 63% The

rating for this indicator is 4.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment relations

The owners are freelance and they have a worker with a binding contract.

The rating for this indicator is 5.

S4_EQUITY

S41_Non-Discrimination

S411_ Non Discrimination

The enterprise hires people that likes the job. The idea is to have long-term workers. Therefore, the enterprise has not have a non-discrimination policy but evidences of discrimination were not find.

The rating for this indicator is 3.

S42_Gender Equality

S421_Gender Equality

There are no women working on the enterprise. Nevertheless, the farm just has one hired worker. Evidences of discrimination were not found.

The rating for this indicator is 5.

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

The enterprise has provided safety and Health trainings to its workers and has a safety plan. Therefore, 100% of the employees has received training.

The rating for this indicator is 5.

S512_Safety of Workplace, Operations and Facilities

The enterprise offers safe, clean and healthy workplace.

The rating for this indicator is 5.

S513_Health Coverage and Access to Medical Care

The enterprise gives health coverage however does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

CCPAE_vallès_3
The interview with one of the farmers of CCPAE_vallès_3 was conducted the day 11/04/2016 during 55 minutes of recorded interview out of 2 hours in the farm. A walk around the farm was done with the farmer.

G_GOOD GOVERNANCE

G1_CORPORATE ETHICS

G11_Mission Statement

G111_Mission Explicitness

During the interview the farmer state that “the idea is to sustain a family business according to our values and achieve the maximum self-sufficiency possible”.

Farmers presented examples like product diversification, acknowledging that this make the economic viability more difficult but it’s what farmers want. The enterprise has a webpage but the mission is not stated in there. The values were not stated either, therefore the mission does not give any idea on how the farm pursues sustainability. Farmers can articulate a mission but they cannot fully state how it influences.

The rating for this indicator is 2.

G112_Mission Driven:

Farmers cannot demonstrate properly how the mission is evident in all aspects and practices. The only example was the one stated above.

According to this information the governance body can identify the influence of mission in some aspects.

The rating for this indicator is 3.

G12_Due Diligence

G121_Due Diligence:

The enterprise assumes that just by doing organic agriculture implies respect for the environment. Farmers just have open dialogues about how different decisions can affect. i.e. mulching paper which can contain compounds that are harmful. Nevertheless, there is no clear policy. They are proactive about risk management but not consistently.

The rating for this indicator is 2.

G2_ACCOUNTABILITY

G21_Holistic Audit

G211_Holistic Audit:

The enterprise does not receive any sustainability audit.

The rating for this indicator is 1.

G22_Responsibility

G221_Responsibility

The economic performance of the enterprise is evaluated. However, there is an informal assessment about performance against mission to see if they are deviating from the principles

of the enterprise collected in the mission. The input of stakeholder is collected through direct communication however, there is no existent policy on how stakeholder information is used to assess sustainability in the farm.

The rating of this indicator is 1.

G23_Transparency

G231_Transparency:

There is no policy or strategy. The communication with consumers is direct during the purchasing of products. The farm does not find coherence to have things written down. Therefore, the reporting to costumers specially is conditioned on their words.

The rating of this indicator is 1.

G3_PARTICIPATION

G31_Stakeholder Dialogue

G311_ Stakeholder Identification:

The farmer state how he identified stakeholders with this sentence: “We exist thanks to costumers which trust us.”

Following this rationale, the farmer could identify 25% of the common stakeholders.

The rating for this indicator is 1.

G312_Stakeholder Engagement:

Consumers: in the market and the during the day of direct sales on farm consumers are invited to visit the farm.

Workers: common relation between and employer and an employee.

Therefore, the farm achieves satisfactory engagement of 100% of identified stakeholders.

The rating of this indicator is 5.

G313_ Engagement Barriers:

The enterprise cannot identify any engagement barrier.

The rating of this indicator is 1.

G314_Effective Participation

The participation of consumers is through face-to-face communication. The farmer considers the feedback from costumers and important aspect of direct sales. The way consumers impacted decisions is in crops cultivated and other incidences related to product quality. Nevertheless, there is no feedback channels or evidences.

The rating of this indicator is 3.

G5_HOLISTIC MANAGEMENT

G51_Sustainability Management Plan

G511_Sustainability Management Plan

There is no written plan and the values a plan may address are not stated.

Therefore, it is considered that the organization cannot articulate the values a plan may address.

The rating for this indicator is 1.

G52_Full-Cost Accounting

G521_Full-Cost Accounting

There is to main focus in measuring the success of the enterprise. First, economic viability, because “us [the farmers] could continue farming just if there is profit.” Second, life objectives, like reduction of work hours. “the aim is to be able to live from what we like but without dedicating all day to it.”

Therefore, the enterprise does not account for its impact and performance using any FCA regime.

The rating of this indicator is 1.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Grennhouse Gases

E111_GHG Reduction Target

There is no target. The farmer said: “we follow the principles of organic agriculture.” The

rating for this indicator is 1.

E112_GHG Mitigation Practices

113. Soil fertility management with organic materials and improved fertilizer application timing.

The farm fertilizes with cow manure. The farm fertilizes at the beginning of each season. Therefore, there is no improved application timing.

114. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

There is no stipulated crop rotation because the enterprise is growing and farmers are cultivating more spaces. Farmers try not to repeat crop species.

115. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm with polyculture.

116. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

There are soil and stone bunds in the farm and the farm has a pond which collects water from the rain.

117. Incorporation of residues

The farmers leave the crop residues on the field and pass the rotatory plough.

118. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes

119. The efficiency of fixed equipment is maintained, such as refrigerating stores.

Yes.

120. Use of non-fossil fuel sources of energy.

No.

121. Restoration of degraded lands and/or drained organic soils.

No.

122. Implementation of sound agroforestry practices.

No.

Unacceptable practices:

123. Drainage of organic soils for cultivation; OR
124. Application of high ratings of nitrogen fertilizer; OR
125. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR
126. Practice of slash and burn or burning of residues.

Farmers burn residues as canes (*Arundo donax*) among others.

The farm applies 50% of best practices, however, they also practice and unacceptable practice. Therefore, the rating for this indicator is 1.

E12_Air Quality

E121_Air Pollution Target

There is no target. The farmer said: “we follow the principles of organic agriculture.”

The rating for this indicator is 1. E122_ Air Pollution Prevention Practices Best

Practices:

33. Soil fertility management with optimized fertilizer application ratings and timing (both within the season and within the day)

Farmers do not have in account when to fertilize. Fertilization is done when the crop in the field have been harvested.

34. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

Farmers leave spontaneous vegetation during fallows. Unacceptable

Practices

35. Uncontrolled or poorly managed waste incineration; OR
36. Burning of crop residues; Burning of crop residues is done.

The farm applies 50% of best practices and one unacceptable practice.

The rating for this indicator is 1.

E2_WATER

E21_Water Withdrawal

E211_Water Conservation target There

is no plan or target.

The rating for this indicator is 1.

E212_Water Conservation Practices Best

Practices:

81. Mulching and tillage to break pore continuity and reduce water evaporation from soils

Yes. Straw for mulching is used and tillage.

82. Water harvesting Yes.

83. Minimization of irrigation water, such as by use of efficient irrigation technologies The

farm uses drip irrigation systems and sprinklers.

84. Use of soil moisture and rainfall sensors to optimize irrigation schedules No.

85. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes.

86. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients Yes.

87. Wastewater recycling in vegetable cleaning

No

Unacceptable Practices:

88. Inefficient or not regularly maintained irrigation systems; OR
89. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR
90. Inefficient use of water for handling and processing purposes.

71% of best practices are applied in the farm. No unacceptable practices are applied.

The rating for this indicator is 3.

E22_Water Quality

E221_Clean Water Target There

is no plan or target set.

The rating for this indicator is 1.

E222_Water Pollution Prevention Practices Best

Practices:

73. Use of cover crops, and avoidance of bare fallows

Yes. Cover crops and fallows are left with spontaneous vegetation.

74. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc.; The farm is under organic production and polyculture is practiced.

75. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are the norm.

76. Adoption of no spray buffer zones Yes. Edges.

77. Conservation tillage practices No.

78. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life

Only accepted organic phytosanitary are used.

79. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Yes.

Unacceptable Practices:

80. Application of pesticides that are not allowed by law; OR

81. Absence of any buffer zones to protect surface water, violation of water protection areas.

86% of best practices are applied in the farm. No unacceptable practices are applied.

The rating for this indicator is 5.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

41. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life. Yes. The farms fertilize with cow manure

42. Wise application of mineral fertilizers to improve soil fertility No.

43. Liming to increase soil pH if acidity is present Yes.

44. Better drainage and/or subsoiling to increase nutrient availability and water retention Yes.

45. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

No. There is no stipulated crop rotation because farmers are growing and are cultivating more spaces. The farmers try not to repeat crop species.

60% of practices considered to enhance soil quality are applied in the farm.

The rating for this indicator is 4.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

73. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm produces organic and polyculture is practiced all year round. The farm has some trees.

74. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

The farm it is not aware of conservation biological control or other types of biological control. Weed management is done manually and using the cultivator.

75. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

There is no stablished crop rotation and no flower strips or ecological infrastructures are present.

76. Creation and maintenance of habitat networks that facilitate exchange between populations.

No.

77. Longer crop rotations, including nitrogen fixing species No stablished crop rotations however N fixing crops are added.

78. Coverage of bare ground and other soil protection measures.

Spontaneous vegetation.

Unacceptable Practices:

79. Annual monoculture cultivation and /or high external input livestock systems; OR
80. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR 81. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

17% of best practices are applied in the farm.

The rating for this indicator is 2.

E42_Species Diversity

E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

57. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm produces organic and polyculture is practiced all year-round. The farm has some trees.

58. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm it is not aware of conservation biological control or other types of biological control. Weed management is done manually and using the cultivator.

59. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows).

There is no stablished crop rotation and no flower strips or ecological infrastructures are present.

60. Creation and maintenance of habitat networks that facilitate exchange between populations.

No.

61. Establishment of conservation of multi-species tree stands.

There are some trees planted.

62. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

No.

63. Installation of nesting aids.

No.

43% of practices are applied in the farm.

The rating for this indicator is 3.

E424_ Diversity of Production

The farm cultivates 20 species and 51 different varieties all year round and in all area.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

73. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm produces organic and polyculture is practiced all year-round. The farm has some trees.

74. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farm it is not aware of conservation biological control or other types of biological control. Weed management is done manually and using the cultivator.

75. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g. stone and wood heaps, trees and hedgerows)

There is no stablished crop rotation and no flower strips or ecological infrastructures are present.

76. Creation and maintenance of habitat networks that facilitate exchange between populations.

No.

77. In-situ conservation of genetic diversity. The farm saves around 5% (farmer approximation) Unacceptable Practices:

78. Monoculture cultivation; OR
79. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
80. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
81. All production of crops is based on a single genetic lineage.

60% of best practices are applied in the farm.

The rating for this indicator is 4.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: Drip irrigation tape (1)

Fuel: Fossil fuels are used (0)

Mulch: Straw (3)

Fertilizer: The farm uses manure from a nearby farm (3).

Boxes: Plastic recyclable boxes (2)

Phytosanitary: The farm through the management reduces the necessity to use phytosanitary products (5)

The farm applies 47 % of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 3.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set.

The rating for this indicator is 1. E522_Energy

Saving Practices

41. Mainstreaming principles of sustainable energy use into strategies and operations and monitoring energy use and the structure of energy supply, if possible at process level; No.

42. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff; Yes.

43. Replacing energy-intensive processes by less intensive alternatives, for example: shorter transport distances, reduced tillage, better isolation of buildings, more enrgy efficient machinery and procedures; No.

44. Using modern energy services that are energy efficient and do not harm neither human health nor the environment.

No.

45. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

The engine in the cold storage is energy efficient.

40% of feasible energy-saving practices have been implemented.

The rating for this indicator is 3.

E531_Waste Reduction Target:

The farm has no plan or target set.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: The drip irrigation tape is brought to the waste management center. (1)

Boxes: Reused (4)

Mulch: straw is degraded on the soil (3).

Crop residue: crop residue is also burned or reincorporated (0)

40% of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 3.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

The main investments during the last years have been a pond to store water and a cold storage. Furthermore, farmers invest in inputs and renewing machinery. Therefore, the prioritized activities and practices have targeted the improvement of the enterprise sustainability performance and the enterprise can demonstrate progress in its sustainability performance.

The rating of this indicator is 3.

C13_Long-ranging Investment

C131_Long Term Profitability

The main investments during the last years have been a pond to store water and a cold storage. Furthermore, they invest in inputs and renewing machinery. Therefore, the enterprise has focused in investments aiming to generating profits of at least a year and other which generating profits of at least five years. The enterprise has met its financial needs and obligations.

The rating of this indicator is 5.

C132_Bussines Plan

The enterprise has a business plan.

The rating of this indicator is 5.

(The rating of this indicator is approximated because the information collected in the business plan was not made available by the enterprise in the forward questions)

C14_Profitability

C141_ Net Income

The first years the enterprise invested a lot. In consequence, the enterprise had more costs than benefits. However, in the last years the enterprise is having a net income higher than 0. Therefore, the researcher approximates that the enterprise's net income is higher than 0 in three of the last five years and the income net grows within the 5 – year period and the enterprise can pay the debts.

The rating of this indicator is 3.

C142_Cost of Production

The enterprise knows the total costs of production. However, farmers do not know the breakeven point of each product.

The rating of this indicator is 1.

C143_Price Determination

The enterprise fix the prices according to market prices and how difficult is to grow each crop.

Therefore, farmers do not use the break-even point plus a mark-up to decide the price.

The rating of this indicator is 1.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and we able to maintain some production even if environmental catastrophic events occur (hail, drought,...)

Therfore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating for this indicator is 3.

C212_Product Diversification

The enterprise grows 20 species and 51 varieties of vegetables. Farmers produce eggs and cereals. The enterprise has not developed any formal or informal risk assessment according to the number of crops grown.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered a shortage of inputs and has access to diverse procurement channels. The main input considered by the farmer are seedlings and seeds. The farm has a joint planning with the nursery.

The rating for this indicator is 5.

C222_Stability of Supplier Relationships

According to the approximation done by the interviewed farmer all the business relationships has remained on-going since the inception of the Enterprise in 2012. The contracts are beneficial.

The rating for this indicator is 5.

C223_Dependence on the Leading Supplier

The Enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The enterprise sells its product through farmer markets in 5 different markets of the Vallès counties. They complement it with one day of farm sales and a consumer cooperative (10%).

The farm sells all products.

The rating for this indicator is 5.

C24_Liquidity

C241_Net Cash Flow

The enterprise did not answer the follow up question. The enterprise net cash flow is above 0.

The rating for this indicator is 5.

C242_ Safety Nets

The enterprise did not answer the follow up question. The enterprise considers that they will have access to informal or formal financial sources. Nevertheless, the enterprise has not implemented any step to improve their financial security.

The rating of this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to Quality of Life

The farmer stated that they work more than 40 hours per week but was not capable to give an exact number. Therefore, it is possible that overtime is compulsory and not fully compensated. However, they perceive that they have worked less than the last year. Furthermore, they have one free day per week.

The rating for this indicator is 1.

S112_Wage level

All employees earn between 650 to 1200 euros.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair access to means of production

65. Agricultural extension services that are regular and helpful.

Yes. They are part of an ADV ("Associació de Defensa Vegetal").

66. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

They assist to trainings from IRTA ("Institut de Recerca Tècniques Agrícoles")

67. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.

The farmer has assisted for two years to a course of horticultural entrepreneurs.

68. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The farmer made no reference to any farmer-to farmer organization or foundations or cooperatives.

69. Trainings offered free of charge by major buyers.

No.

70. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

The farmer considers they have enough access to equipment.

71. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

The enterprise can maintain sufficient storage and other units.

72. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

The enterprise can access to the necessary parts.

The percentage of practices applied is 75%.

The rating for this indicator is 4.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment Relations

All members of the enterprise have a signed contract.

The rating for this indicator is 5.

S4_EQUITY

S41_Non-Discrimination

S411_ Non Discrimination

There is no policy in hiring people. Nevertheless, during my visit evidences of discrimination were not detected.

The rating for this indicator is 3.

S42_Gender Equality

S421_Gender Equality

There is a two woman working on the enterprise. There are no differences between men and women. They never faced the situation of pregnant woman.

The rating of this indicator is 5

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and Safety and Health Provisions

S511_Safety and Health Trainings

The enterprise provides safety and health trainings to all workers.

The rating for this indicator is 5.

S512_Safety of Workplace, Operations and Facilities The

enterprise provides a safe, clean and healthy workplace.

The rating for this indicator is 5.

S513_Health Coverage and Access to Medical Care

The enterprise offers health coverage but does not have emergency protocols. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

CCPAE_osona_1

The interview with one of the farmers of CCPAE_osona_1 was conducted the 06/04/2016. The recorded interview lasted for 85 minutes for a total of 2 hours of visit considering a walk around the farm without the presence of the farmer.

G_GOVERNANCE

G1_CORPORATE ETHICS

G11_Mission Statement

G111_Mission Explicitness:

During the interview the farmer stated that the mission is "to produce vegetables which are not harmful for the health of consumers." In one website the enterprise expresses another parallel objective which is "to raise awareness about organic product."

He can explain how it influences on the variety of products. Therefore, the mission assesses some issues of sustainability as environmental and social benefits however, there were difficulties to explain how influences.

The rating for this indicator is 2.

G112_Mission Driven:

The governance body has difficulties to assess ways of mission driven. Nevertheless, in a website there is examples as preparing open farm days or selling through direct marketing channels. Organic agriculture is a way to sustain its mission.

The rating for this indicator is 3.

G12_Due Diligence

G121_Due Diligence:

The farmer states that there is a policy, however, he failed to explain it. The farmer states that health issues are the main focus of their policy. Nevertheless, there is no accounting for the rest of issues.

Therefore, the enterprise has no evidence of proactive management. Even if farm practices are not harmful.

The rating for this indicator is 1.

G2_ACCOUNTABILITY

G22_Holistic audit

G221_Holistic Audit:

The farm was part of the PGS but the enterprise left the group before any audit was performed on their farm. Therefore, no sustainability audit have been conducted in the farm. The farmer considers audits are just of use if you are lost but the farmer considers he has enough experience

and do not need audits. Furthermore, he states that his costumers buy in his farm because they know him.

The rating for this indicator is 1.

G22_Responsibility

G221_Responsibility:

There is no comparison of mission against performance. Nevertheless, some technical aspects and internal management are collected in documents. Farm performance is assessed in “daily indicators” e.g. customer flow and costumer interest for rare species.

However, stakeholders are not invited to those discussions.

The rating of this indicator is 1.

G23_Transparency

G231_Transparency:

The information the manager considers is relevant for the consumers is which products are produced by him and which others are bought, which products are on season and no more. Therefore, there is no explicit and open policies to disclose information relevant in all aspects of sustainability.

The rating for this indicator is 1.

G3_PARTICIPATION

G311_Stakeholder Identification

The farmer identified other producers and organic distributors because the enterprise purchases their products, workers because is the way you earn a living and customers are receivers of the product.

The farmer could identify 50% of the stakeholders and explain the mechanisms used for their identification. Therefore, the rating of this indicator is 3.

G312_Stakeholder Engagement

The relation with consumers is positive, during my visit I had the option to assess the relation with consumers because it was the day the enterprise has on-farm sales. Open dialogues about products are hold.

Workers: Family workers are engaged. Nevertheless, other workers were not present during the visit. Furthermore, they use exchange of work for boxes of vegetables and seems to work well.

The engagement with other farmers is reduced and just based in product exchange. When I asked for some contacts to farmers he farmer preferred not to discover the relation with me. It is considered non-satisfactory engagement.

The relation with distribution companies is just commercial. However, it is considered a satisfactory engagement.

Therefore, the enterprise achieved satisfactory engagement with 75% of the stakeholders identified.

The rating for the indicator is 4.

G313_Engagement Barriers

There are issues to engage with other producers from which the farmer buys some products. There is no direct relation, just a commercial relation. Therefore, the farmer considers that one part is lost. The organic label is the only communication they have.

The farmer considers that consumers are well inform until some extent. The main topics are quality and origin. To improve the engagement, the farm has open doors days. The farmer considers that their clients are not very engaged but it is seen as something which cannot be changed. It is an inherent characteristic of consumers. The farmer states that farm's consumers are driven by product and price.

The farmer consider that communication is not a strategy to involve people. However, there is no other strategy in place.

Therefore, the farmer is failing to identify barriers to participation and act upon them.

The rating for this indicator is 1.

G314_ Effective Participation

The participation of consumers is reduced to assess the quality of the product. Therefore, they have the capacity to help the farmer to consider supplier changes or procedure changes when it is farm product. However, there is no evidences of this.

Therefore, the enterprise has not engaged stakeholders or is unable to demonstrating that stakeholder engagement has genuinely affected the decisions it has made.

The rating for this indicator is 1.

G5_HOLISTIC MANAGEMENT

G51_Sustainability Management Plan

G511_Sustaianbility Management Plan

The farmer states that the farm has a sustainability management plan. When asked which aspects are collected on it farmer states basically economic aspects and diversification of products. The farmer is producing their own products, however is also purchasing products cultivated in other continents as coconuts.

Therefore, the researcher considers that the organization cannot articulate the values and aspirations a plan may address.

The rating of this indicator is 1.

G52_Full-Cost Accounting

G521_Full-Cost Accounting

The farmer measures the success of the enterprise according to daily satisfaction. “I do not account for nothing else.”

Therefore, the enterprise does not account for its impact and performance using any FCA regime.

The rating for this indicator is 1.

E_ENVIRONMENTAL INTEGRITY

E1_ATMOSPHERE

E11_Greenhouse Gases

E111_GHG Reduction Target

The farmer has a plan, however there is no set target. The farmer tries a continuous improvement. The farmer is planning to shift its production from horticultural production to intercropping of trees and vegetables. The farm has started this transformation by planting hazels. The main emission source is the tractor.

Nevertheless, the rating of this indicator is 1.

E112_GHG Mitigation Practices:

Best practices:

127. Soil fertility management with organic materials and improved fertilizer application timing.

The farm uses composted manure mixed with crushed trimming. Furthermore, the farm is experimenting in fertirrigation with one specie of the genus *Symphytum.* It is common in people practicing biodynamic farming in the area.

128. Extended crop rotations, use of cover crops, and avoidance of using bare fallows.

The crop rotation is 3 years based in families and the harvested part. The farm is experimenting with a mixture of Vetch (*Vicia sativa)* + Barley (*Hordeum vulgare* L.). Furthermore, *Phacelia sp.* and *Tanacetum vulgare* as green manure.

129. Land-cover change to more complex and diverse systems such as organic agriculture, agroforestry, mixed-crop livestock systems, intercropping, perennials, forest gardens, etc.

It is an organic farm, with areas of perennials and polyculture.

130. Soil and water conservation measures, such as soil or stone bunds, drainage measures, swales, water harvesting, low-energy irrigation (if used).

There are soil bunds and stone bunds in the farm. The greenhouses have the capacity to harvest water however it is not already functioning. 131. Incorporation of residues There is incorporation of residues.

132. Engines are regularly serviced and suitable (i.e. lowest powered) tractors /machinery is used.

Yes.

133. The efficiency of fixed equipment is maintained, such as refrigeratingd stores.

Yes.

134. Use of non-fossil fuel sources of energy.

No.

135. Restoration of degraded lands and/or drained organic soils.

No.

136. Implementation of sound agroforestry practices.

Yes. The farmer is starting to experiment a mixture of vegetables and trees.

Unacceptable practices:

137. Drainage of organic soils for cultivation; OR
138. Application of high ratings of nitrogen fertilizer; OR
139. Land-use changes that reduce ecosystem soil C stocks (e.g. deforestation, ploughing long term grasslands); OR
140. Practice of slash and burn or burning of residues.

The farm is applying 80% of best practices and non-unacceptable practices.

The rating of this indicator is 5.

E12_Air Quality

E121_Air Pollution Target

The farmer has a plan, however there is no set target.

The rating for this indicator is 1. E122_Air

Pollution Prevention Practices Best

Practices:

37. Soil fertility management with optimized fertilizer application ratings and timing (both within the season and within the day) Application of manure is optimized.
38. Maintenance of permanent and dense soil coverage to prevent wind erosion (and thus dust emissions).

During fallows green manure is planted. The mixture and species used are detailed in E_112.

Unacceptable Practices

39. Uncontrolled or poorly managed waste incineration; OR
40. Burning of crop residues;

The farm uses 100% of best practices and no unacceptable practice.

The rating for this indicator is 5.

E2_WATER

E21_Water Withdrawal E211_Water

Conservation target There is no plan

or target.

The rating of this indicator is 1.

E212_Water Conservation Practices Best

Practices:

91. Mulching and tillage to break pore continuity and reduce water evaporation from soils

Crushed trimmings are used as mulch. Tillage is practiced.

92. Water harvesting No

93. Minimization of irrigation water, such as by use of efficient irrigation technologies

No

94. Use of soil moisture and rainfall sensors to optimize irrigation schedules No

95. Breeding and selection of crop species and varieties that are adapted to local climate and make efficient use of water Yes. Very related to local varieties.

96. Enhancement of water use efficiency by preventing losses of produce due to pests, diseases or lack of nutrients

yes

97. Wastewater recycling in vegetable cleaning No.

Unacceptable Practices:

98. Inefficient or not regularly maintained irrigation systems; OR

The farm uses flood irrigation which it is considered inefficient. The farmers waters once a week. The water in the farm has a high concentration of Calcium which provokes the obstruction of drip irrigation systems.

99. Monoculture cultivation of water-demanding crops/trees in water-scarce areas; OR 100. Inefficient use of water for handling and processing purposes.

The farm applies 57% of best practices and one unacceptable practice.

The rating for this indicator is 1.

E22_Water Quality E221_Clean

Water Target There is no plan

or target.

The rating for this indicator is 1.

E222_Water Pollution Prevention Practices

82. Use of cover crops, and avoidance of bare fallows The farm uses cover crops and avoid bare fallows.

83. Land use and land cover change to more complex and diverse systems with better soil coverage, such as agroforestry, organic management, mixed crop-livestock systems, intercropping, perennials, polycultures, forest gardens, etc; The farm is organic and polyculture is practiced.

84. Soil and water conservation measures, such as soil or stone bunds, drainage measures, furrow dikes, swales, raised beds Soil bunds are in place.

85. Adoption of no spray buffer zones

The only pesticide used is Bacillus turingensis for the brassica's caterpillar.

86. Conservation tillage practices No.

87. Non-use of highly hazardous chemicals, Persistent organic pollutants, and those having potential adverse effects on aquatic life Yes.

88. Protecting hedgerows, water courses, wells, boreholes and springs by not cultivating adjacent to them or leaving at least 3 meters of distance with buffer strips Yes.

Unacceptable Practices:

89. Application of pesticides that are not allowed by law; OR

90. Absence of any buffer zones to protect surface water, violation of water protection areas.

The farm applies 86% of best practices and no unacceptable practices are used.

The rating for this indicator is 5.

E3_LAND

E31_Soil Quality

E311_Soil improvement practices Practices

assessed were:

46. Application of organic fertilizers (manure, slurry, compost) to enhance soil organic matter content, improve crop nutrient supply and stimulate soil life.

Yes. The farm use composted manure mixed with crushed trimming. Furthermore, the farm is experimenting in fertirrigation with one specie of the genus *Symphytum*. The farm is experimenting in the quantity of compost that plants can admit.

47. Wise application of mineral fertilizers to improve soil fertility No.

48. Liming to increase soil pH if acidity is present Yes.

49. Better drainage and/or subsoiling to increase nutrient availability and water retention No.

50. Implementation of a diverse crop rotation, including the introduction of fodder and cover crops, improved fallow techniques, intercropping, etc. to enhance soil structure, soil organic matter content and soil biological activity and soil health in general.

The crop rotation is 3 years based in families and the part which is harvested.

The farm applies 60% of practices considered to improve soil quality.

The rating for this indicator is 4.

E4_BIODIVERSITY

E41_Ecosystem Diversity

E411_Landscape habitat Conservation Plan There

is no plan or set target.

The rating for this indicator is 1.

E412_Ecosytem Enhancing Practices Best

Practices:

82. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is producing organic and polyculture is practiced. There is perennials.

83. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, management of pollination, etc.

The farm follows conservation pest control, a diverse crop rotation and no synthetic pesticides are used. Furthermore, there is a variety of tree stands, including herbs and bushes. The farm does beekeeping. Weed management is based in green manure, manual and mechanic. Mulching is important.

84. Diversity-enhancing crop management (e.g. diverse crop rotation), no use of synthetic herbicides, maintenance of wild flowers strips and ecological infrastructures, such as stone and wood heaps, trees and hedgerows.

Crop rotation is practiced and no synthetic herbicides are used. Wild flora is enhanced by not touching it and stone heaps are present in the farm. Furthermore, the pond serves as a gathering point for several species of vertebrates.

85. Creation and maintenance of habitat networks that facilitate exchange between populations.

Yes. The farm has a wilderness looking.

86. Longer crop rotations, including nitrogen fixing species The crop rotation incorporates

    N fixing species.

87. Coverage of bare ground and other soil protection measures.

Bare soil is avoided by leaving spontaneous vegetation or green manure.

Unacceptable Practices:

88. Annual monoculture cultivation and /or high external input livestock systems; OR
89. Land use or land cover change from more complex systems, such as natural or seminatural forests, grasslands and lakes are converted to arable land; OR 90. Reliance on off-farm synthetic inputs for both fertilizers and pesticides.

100% of best practices are applied.

The rating for this indicator is 5.

E42_Species Diversity

E421_Species Conservation Target There

is no plan or target set.

The rating for this indicator is 1.

E422_Species Conservation Practices

64. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is producing organic and polyculture is practiced. There is perennials.

65. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farms follows conservation pest control, a diverse crop rotation and no synthetic pesticides are used. Furthermore, there is a variety of tree stands, including herbs and bushes. The farm does beekeeping. Weed management is based in green manure, manual and mechanic. Mulching is important.

66. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

Crop rotation is practiced and no synthetic herbicides are used. Wild flora is enhanced by not touching it and stone heaps are present in the farm. Furthermore, the pond serves as a gathering point for several species of vertebrates.

67. Creation and maintenance of habitat networks that facilitate exchange between populations.

Yes. The farm has a wilderness looking.

68. Establishment of conservation of multi-species tree stands.

There are several species of tree stands. Cultivated and not cultivated.

69. Creation and maintenance of wildlife habitat and of a species-diverse forest edge.

The connection between the farm and the surrounding forest in the northern edge is smooth and ecotones are created. .

70. Installation of nesting aids.

No nesting aids are provided.

86% of practices are applied.

The rating for this indicator is 5.

E424_ Diversity of Production

The farm plants around 130 different varieties all year round.

The rating for this indicator is 5.

E43_Genetic Diversity

E431_Wild Genetic Enhancing Practices Best

Practices:

82. Land-cover and land use change to more structurally complex and species-diverse systems, such as agroforestry, mixed crop-livestock systems, intercropping, perennials, forest gardens, etc.

The farm is producing organic and polyculture is practiced. There is perennials.

83. Use of ecological approaches in tillage, soil fertility and disease, pest and weed control (e.g. trap cropping), integrated pest management, integrated weed management, etc.

The farms follows conservation pest control, a diverse crop rotation and no synthetic pesticides are used. Furthermore, there is a variety of tree stands, including herbs and bushes. The farm does beekeeping. Weed management is based in green manure, manual and mechanic. Mulching is important.

84. Diversity enhancing crop and grassland management, no use of conditioners (as they kill invertebrates), maintenance of wild flower strips and ecological infrastructures (e.g stone and wood heaps, trees and hedgerows).

Crop rotation is practiced and no synthetic herbicides are used. Wild flora is enhanced by not touching it and stone heaps are present in the farm. Furhtermore, the pond serves as a gathering point for several species of vertebrates.

85. Creation and maintenance of habitat networks that facilitate exchange between populations.

The connection between the farm and the surrounding forest in the northern edge is smooth and ecotones are created. .

86. In-situ conservation of genetic diversity.

The farm saves 40% of the seeds from year to year. There is no conservation of wild species in a concrete manner.

Unacceptable Practices:

87. Monoculture cultivation; OR
88. Land use or land cover change from more complex systems (e.g. natural or semi-natural forests and lakes), to arable land; OR
89. No habitat left aside for wildlife, such as buffer strips, wildflower strips, etc; OR
90. All production of crops is based on a single genetic lineage.

100% of the practices are applied.

The rating for this indicator is 5.

E5_MATERIALS AND ENERGY

E51_Material Use

E511_Material Consumption Practices

Drip irrigation System: The farm does not use irrigation systems (5)

Fuel: fossil fuel is used (0)

Mulch: The farmer uses materials from the farm as plant residues. (5) Fertilizer:

The farm uses manure from a nearby farm (3).

Boxes: The farm uses wooden boxes which at the time of my interview were in a pile in a field. (2)

Phytosanitary: The farm through the management reduces the necessity to use phytosanitary products (5)

The farm applies 67% of feasible practices to reduce the consumption of non-renewable, virgin materials.

The rating for this indicator is 4.

E52_ Energy Use

E521_ Renewable Energy Use Target:

The farm has no plan or target set.

The rating for this indicator is 1. E522_Energy

Saving Practices

46. Mainstreaming principles of sustainable energy use into stratinggies and operations and monitoring energy use and the structure of energy supply, if possible at process level; No.

47. Informing staff and stakeholders about ways to save energy and encouraging suggestions from staff;

Yes. There is some dialogues. Currently a burning issue in the farm is switching off the lights.

48. Replacing energy-intensive processes by less intensive alternatives, for example:
shorter transport distances, reduced tillage, better isolation of buildings, more enrgy efficient machinery and procedures;

Yes. Farmer is trying to reduce the necessity to use the tractor by applying compost and reduce tillage.

49. Using modern energy services that are energy efficient and do not harm neither human health nor the environment. No

50. Investing into better insulation of buildings, reductions of unnecessary energy use, optimizing processes, etc.

Yes.

60 % of feasible energy-saving practices have been implemented.

The rating for this indicator is 4.

E531_Waste Reduction Target:

The farm has no plan or target set.

The rating for this indicator is 1.

E532_Waste reduction Practices

Drip irrigation tape: No used (5)

Boxes: The farm uses wooden boxes which at the time of my interview were in a pile in a field. (1)

Mulch: Internal products are used for mulching (5)

Crop residue: the residues are composted (3)

65% of feasible practices to reduce waste generation have been implemented.

The rating for this indicator is 4.

ECONOMIC RESILIENCE

C1_INVESTMENT

C11_Internal Investment

C111_Internal Investment

The enterprise has invested in the last five years in greenhouses and trees (hazelnuts). Therefore, the aim is to increase the sustainability performance and investments target this.

The rating of this indicator is 3.

C13_Long-ranging Investment

C131_Long Term Profitability

The enterprise has invested in the last five years in greenhouses and trees (hazelnuts). Therefore, the aim is to increase the sustainability performance and investments target this. Furthermore, the enterprise invest in inputs. Therefore, the enterprise invest in long-term and short term. The enterprise has met all financial needs and obligations.

The rating for this indicator is 5.

C132_Bussines Plan

The enterprise does not have a business plan or anything similar.

The rating for this indicator is 1.

C14_Profitability

C141_ Net Income

The enterprise does not know their net income.

The rating of this indicator is 1.

C142_Cost of Production

The enterprise does not know their total cost of production.

The rating of this indicator is 1. C143_Price

Determination

The farmer uses reference prices from ‘Hortec’ (cooperative). Then the farmer adds a markup because the farmer sells retail.

Therefore, the enterprise does not uses the break-even point.

The rating for this indicator is 1.

C2_VULNERABILITY

C21_Stability of Production

C211_Guarantee of Production Levels

Product diversification: It is an important mechanism and the enterprise has different income generation activities and products (detailed in C212 indicator) which help to reduce the environmental and economic shocks. Furthermore, crop growth of same species is staged in order to maintain a continuous growth and we able to maintain some production even if environmental catastrophic events occur (hail, drought,...)

Water harvesting: the enterprise has a pond which helps to irrigate crops in drought times.

Therfore, the enterprise has not developed any plan but has identified mechanisms to guarantee the required volume of production and the compliance with quality standards in the event of facing social, environmental and economic shocks and the enterprise has implemented mechanisms to guarantee production and quality levels.

The rating of this indicator is 3.

C212_Product Diversification

The enterprise produces 130 varieties. The enterprise has not conducted any formal or informal risk assessment.

The rating for this indicator is 2.

C22_Stability of Supply

C221_Procurement Channels

The main inputs considered are drip irrigation system, fuel, mulch, fertilizer, boxes, phytosanitary and seeds or seedlings. The enterprise never suffered a supply shortage and has access to diverse procurement channels. The enterprise plan seedlings with different nurseries; and crushed trimmings and manure is purchased close by the farm.

The rating or this indicator is 5.

C222_Stability of Supplier Relationships

The farmer has worked with the same input suppliers since the beginning.

The rating of this indicator is 5.

C223_Dependence on the Leading Supplier

The enterprise has not conducted a risk analysis to identify its level of vulnerability however it has a diversified supply structure and the inputs coming from the leading supplier does not exceed the 50%.

The rating for this indicator is 4.

C23_Stability of Market

C231_Stability of Market

The enterprise sells through farmer's Markets. The farm sells on two different markets and direct on-farm three days a week. The enterprise approximates that wins the same from each markets and direct sales on-farm (33%).

There are products they cannot sell some products. The farmer argues that some of them are because people do not know the vegetables the farm offers. However, there is no information of the financial loses they represent.

The rating of this indicator is 1.

C24_Liquidity

C241_Net Cash Flow

The enterprise did not answer the follow up questions. During the interview the farmer said that since they fired all their workers the liquidity of the company has improved a lot and the net cash flow is above 0.

The rating for this indicator is 5.

C242_ Safety Nets

The farmer considers that they do not have any financial sources to overcome a liquidity crisis.

The rating for this indicator is 1.

SOCIALWELL-BEING

S1_DECENT LIVELIHOOD

S11_Quality of Life

S111_Right to quality of life

The interviewed farmer worked around 60 hours per week as an average depending on the family needs. Therefore, overtime is compulsory.

The rating for this indicator is 1.

S112_Wage level

The salary of the members of the farm is between 1200-650.

The rating for this indicator is 3.

S13_Fair Access to Means of Production

S131_Fair Access to Means of Production

73. Agricultural extension services that are regular and helpful.

The farmer does not use extension services.

74. Annual conferences, trainings, or events that they regularly attend or send managers to that are opportunities for gaining skills.

The farmer has not mentioned any annual conference in which he assists.

75. Courses at local or online colleges, foundations, or other programs to teach best practices and skills.

The farmer assists to courses in Escola Agraria de Manresa.

76. Relationships that are well maintained with associations, non-profit foundations, cooperatives or other such collective groups that promote networking and peer based education of best practices and skills.

The farmer uses farmer-to-farmer trainings. Organised by themselves without any organization which takes part on it.

77. Trainings offered free of charge by major buyers.

No.

78. Maintain sufficient facilities without buildings or equipment going into disrepair that significantly slows-down or impacts production.

The facilities are well maintained and nothing is going to disrepair.

79. Purchase, construct or maintain sufficient storage and other units to prevent postharvest losses, contamination and other degradation outputs.

The enterprise has built the necessary equipment.

80. Access necessary parts, upgrades, and other components needed or implementing best practices without risking stilling debt that would prevent the enterprise from complying with other areas of sustainability (such as paying a living wage).

The enterprise can access to necessary parts.

The percentage of practices applied is 63%.

The rating for this indicator is 4.

S3_LABOUR RIGHTS

S31_Employment Relations

S311_Employment Relations

The enterprise is made of freelance workers. Therefore, all of them have signed contracts.

The rating for this indicator is 5.

S4_EQUITY

S41_Non-Discrimintation

S411_ Non Discrimination

The farmer hires people who goes personally to ask for a job. The farmer depending on the "feeling" to that person hires them or not.

The enterprise has no written policy, however, evidence of discrimination was not found.

The rating for this indicator is 3.

S42_Gender Equality

S421_Gender Equality

There are 2 women working on the enterprise with contract and one man. One of the woman had a baby and had the possibility to continue the job after and the farmer explained that if the other worker decides to have a baby the enterprise will do the same.

The rating for this indicator is 5.

S5_HUMAN SAFETY AND HEALTH

S51_Workplace and safety and Health provisions

S511_Safety and Health trainings

The enterprise does not provide safety and Health trainings.

The rating for this indicator is 1.

S512_Safety of workplace, operations and facilities The

enterprise ensures a safe, clean and Health workplace.

The rating for this indicator is 5.

S513_Health coverage and access to Medical care

The enterprise gives health coverage but does not have emergency protocols but the owner was a nurse. Nevertheless, is a very small farm and they have cell phones and farm truck to ensure a fast evacuation in case of accident.

The rating for this indicator is 5.

Appendix 4: Tables of practices

G_311 Stakeholder Identification & G312_Stakeholder Engagement

stakeholder/farm	PGS										CCPAE							
	vallès_1		vallès_3		osona_1		osona_2		vallès_2		vallès_2		vallès_3		vallès_1		osona_1	
CONSUMERS	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1
WORKERS	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1
OTHER FARMERS	1	1	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	0
SUPPLIERS	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
STUDENTS	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
LANDLORDS	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
WALKERS	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
ORGANIZATIONS	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
COLLECTION POINT	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
DISTRIBUTION CO.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
CCPAE	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
LOCAL adm.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MARKET ORGANISER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total percentage	50	100	38	100	50	100	50	100	50	100	13	100	38	100	25	100	50	50

The column on the left represents G_311 Stakeholder Identification and the column on the right represents G_312 Stakeholder Engagement

E_112 GHG Mitigation Practices

	PGS					CCPAE			
	v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
1	1	1	1	1	1	1	0	1	1
2	1	1	0	1	1	1	0	0	0
3	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1	1	1
8	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0
10	0	0	0	0	1	1	0	0	0
11	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0
13	0	0	0	1	0	0	0	0	0
14	1	1	1	1	1	0	1	0	0
	70	70	60	70	80	80	50	60	60

E_122 Air Pollution Prevention Practices

PGS					CCPAE			
v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
1	1	1	1	1	1	0	1	1
1	1	0	1	1	1	1	0	0
1	0	0	0	0	0	0	0	0
0	1	1	1	1	0	1	0	0
100	100	50	100	100	100	50	50	50

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E212_Water Conservation Practices

	PGS						CCPAE			
	v_2	v_1	v_3	o_1	o_2		o_1	v_3	v_1	v_2
1	1	1	1	0	1	1		1	0	1
2	0	0	0	1	0	0		1	0	0
3	1	1	1	1	1	0		1	1	1
4	1	0	0	0	0	0		0	0	1
5	1	1	1	1	1	1		1	1	1
6	1	1	1	1	1	1		1	1	1
7	0	1	0	0	0	0		0	0	0
8	0	0	0	0	0	1		0	0	0
9	0	0	0	0	0	0		0	0	0
10	0	0	0	0	0	0	0	0		0
	71	71	57	57	57	57	71	43		71

E222_Water Pollution Prevention Practices

	PGS							CCPAE			
	v_2	v_1	v_3	o_1	o_2			o_1	v_3	v_1	v_2
	1	1	0	1			0	1	1	0	0
	1	1	1	1			1	1	1	1	1
	1	1	1	1			1	1	1	1	1
	1	1	1	1			1	1	1	1	0
	0	0	0	0			0	0	0	0	0
	1	1	1	1			1	1	1	1	1
	1	1	1	1			1	1	1	1	0
	0	0	0	0			0	0	0	0	0
	0				0	0	0	0			1
	86	86	71	86			71	86	86	71	43

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E311_Soil Improvement Practices

PGS						CCPAE			
v_2	v_1	v_3	o_1		o_2	o_1	v_3	v_1	v_2
1	1	1	1		1	1	1	1	1
0	0	1	0		1	0	0	0	0
1	1	1	1		0	1	1	1	1
1	1	1	1		1	0	1	1	1
1	1	0	1	1	1		0	0	0
80	80	80	80		80	60	60	60	60

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4
5

E_412 Ecosystem Enhancing Practices

PGS					CCPAE			
v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	0	1	1
1	1	1	1	1	1	0	1	1
0	0	0	1	1	1	0	0	0
1	1	0	1	1	1	0	1	1
1	1	0	1	1	1	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0
83	83	50	100	100	100	17	67	67

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E422_Species Conservation Practices

PGS						CCPAE			
v_2	v_1	v_3		o_1	o_2	o_1	v_3	v_1	v_2
1	1	1	1		1	1	1	1	1
1	1	1	1		1	1	1	1	1
1	1	1	1		1	1	0	1	1
0	0	0	1		1	1	0	0	0
1	0	0	0		1	1	1	0	0
0	1	0	1		1	1	0	1	0
0	0	0	0	1	0		0	0	0
57	57	43	71		100	86	43	57	43

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E431_Wild Genetic Enhancing Practices

PGS					CCPAE			
v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	0	1	1
0	0	0	1	1	1	0	0	0
1	1	1	1	1	1	1	1	1
0	0	0	0	0	0	0	0	0

1
2
3
4
5
6

0	0	0		1		0	0	0		0	0		
0	0	0		0		0	0	0		0	0		
0			0	0	0			0	0		0		
80	80	80	100			100	100	60	80		80		

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E511_Material Consumption Practices

	PGS					CCPAE			
DRIP IRRIGATION	v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
SYSTEM	1	4	3	4	5	5	1	1	1
FUEL	0	5	0	0	0	0	0	0	0
MULCH	2	2	5	5	2	5	3	5	2
FERTILIZER	3	3	3	3	3	3	3	3	3
BOXES	1	2	2	2	1	2	2	1	2
PHYTOSANITARY	5	5	5	5	5	5	5	5	5
	40	70	60	63	53	67	47	50	43

E522_Energy Saving Practices

	PGS					CCPAE			
	v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
1	0	1	0	0	1	0	0	0	1
2	1	1	1	1	1	1	1	1	0
3	0	1	1	1	0	1	0	1	1
4	0	1	0	0	0	0	0	1	0
5	1	0	1	1	1		1	1	0
	40	80	60	60	60	60	40	80	40

E532_ Waste Reduction Practices

	PGS					CCPAE			
DRIP IRRIGATION	v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
BOXES	0	5	1	5	1	5	1	1	3
MULCH	0	5	4	4	4	0	4	4	4
CROP RESIDUE	3	3	0	5	3	5	3	5	3
	4	0	0	0	0	3	0	3	3
	35	65	25	70	40	65	40	65	65

5 reduce>4 reuse>3 recycle>2 recover > 1 dispose > 0 bad disposal

S131_ Fair Access to Means of Production

PGS					CCPAE			
v_2	v_1	v_3	o_1	o_2	o_1	v_3	v_1	v_2
1	0	0	0	0	0	1	0	1
0	1	0	1	1	0	1	0	0
0	1	1	1	1	1	1	0	0

1
2
3

1	1	1	1					1	1	0	1	1
0	0	0	0					0	0	0	0	0
1	1	1	1					1	1	1	1	1
0	1	1	0					1	1	1	1	1
1			1	1	1	1					1	1
50			63	75	63	75				50		63

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Appendix 5: Table of indicator scores

INDICTORS/FARMS	PGS_ vallès _1	PGS_ vallès _2	PGS_ osona _1	PGS_ osona _2	PGS_ vallès _3	CCPA E_vallè s_1	CCPA E_vallè s_2	CCPA E_vallè s_3	CCPA E_oson a_1
G_GOOD GOVERNANCE									
G1_CORPORATE ETHICS	0,9	0,6	0,9	0,7	0,6	0,2	0,5	0,45	0,35
G11_mission statement	1	1	1	0,6	0,8	0,2	0,6	0,5	0,5
G111_mission explicitness	5	5	5	3	5	1	3	2	2
G112_mission driven	5	5	5	3	3	1	3	3	3
G12_Due diligence	0,8	0,2	0,8	0,8	0,4	0,2	0,4	0,4	0,2
G121_due diligence	4	1	4	4	2	1	2	2	1
G2_ACCOUNTABILITY	0,87	0,93	0,87	0,47	0,53	0,2	0,2	0,2	0,2

G21_Holistic audit	0,6	0,8	1	0,2	0,8	0,2	0,2	0,2	0,2
G211_holistic audits	3	4	5	1	4	1	1	1	1
G22_Responsibility	1	1	1	0,6	0,2	0,2	0,2	0,2	0,2
G221_responsibility	5	5	5	3	1	1	1	1	1
G23_Transparency	1	1	0,6	0,6	0,6	0,2	0,2	0,2	0,2
G231_transparency	5	5	3	3	3	1	1	1	1
G3_PARTICIPATION	0,9	0,85	0,9	0,7	0,75	0,4	0,4	0,5	0,45
G31_Stakeholder dialogue	0,9	0,85	0,9	0,7	0,75	0,4	0,4	0,5	0,45
G311_Stakeholder identification	3	3	3	3	2	1	1	1	3
G312_ Stakeholder engagement	5	5	5	5	5	5	5	5	4
G313_Engagement barriers	5	4	5	1	5	1	1	1	1
G314_Effective Participation	5	5	5	5	3	1	1	3	1
G5_ HOLISTIC MANAGEMENT	0,6	0,6	0,4	0,2	0,2	0,2	0,2	0,2	0,2
G51_sustainability management plan	0,6	0,6	0,6	0,2	0,2	0,2	0,2	0,2	0,2
G511_sustainability management plan	3	3	3	1	1	1	1	1	1
G52_Full-cost accounting	0,6	0,6	0,2	0,2	0,2	0,2	0,2	0,2	0,2
G521_Full-cost accounting	3	3	1	1	1	1	1	1	1
E_ENVIRONMENTAL INTEGRITY									
E1_ATMOSPHERE	0,00	0,00	0,00	0,00	0,00	0,42	0,58	0,00	0,67
E11_Greenhouse gases	0	0	0	0	0	0,5	0,5	0	0,666666667
E111_GHG reduction target	0	0	0	0	0	0	0	0	0
E112_GHG mitigation practices	0	0	0	0	0	1,5	1,5	0	2
E12_Air quality	0	0	0	0	0	0,333333333	0,666666667	0	0,666666667
E121_Air pollution target	0	0	0	0	0	0	0	0	0
E122_Air pollution prevention practices	0	0	0	0	0	1	2	0	2
E2_WATER	0,58	0,58	0,50	0,42	0,42	0,42	0,25	0,50	0,33
E21_Water withdrawal	0,5	0,5	0,333333333	0,333333333	0,333333333	0,333333333	0,5	0,333333333	0
E211_water conservation target	0	0	0	0	0	0	0	0	0
E212_water conservation practices	1,5	1,5	1	1	1	1	1,5	1	0
E22_Water quality	0,666666667	0,666666667	0,666666667	0,5	0,5	0,5	0	0,6666666667	0,6666666667
E221_Clean Water target	0	0	0	0	0	0	0	0	0

E222_Water pollution prevention practices	2	2	2	1,5	1,5	1,5	0	2	2
E3_LAND	1	1	1	1	1	0,75	0,75	0,75	0,75
E31_Soil quality	1	1	1	1	1	0,75	0,75	0,75	0,75
E311_Soil improvement practices	2	2	2	2	2	1,5	1,5	1,5	1,5
E4_BIODIVERSITY	0,78	0,78	0,25	0,83	0,67	0,72	0,72	0,53	0,83
E41_Ecosystem diversity	0,66666667	0,66666667	0	0,66666667	0,33333	0,5	0,5	0,1666 66667	0,6666 66667
E411_Landscape Habitat conservation plan	0	0	0	0	0	0	0	0	0
E412_Ecosystem enhancing practices	2	2	0	2	1	1,5	1,5	0,5	2
E42_Species diversity	0,66666667	0,66666667	0,75	0,833 33333	0,66666667	0,6666 66667	0,6666 66667	0,6666 66667	0,8333 33333
E421_Species conservation target	0	0	0	0	0	0	0	0	0
E422_Species conservation practices	1	1	1,5	2	1	1	1	1	2
E424_Diversity of production	3	3	3	3	3	3	3	3	3
E43_Genetic diversity	1	1	0	1	1	1	1	0,75	1
E431_Wild genetic enhancing practices	2	2	0	2	2	2	2	1,5	2
E5_MATERIALS AND ENERGY	0,64	0,33	0,58	0,44	0,42	0,56	0,44	0,39	0,58
E51_material use	0,75	0,5	0,75	0,5	0,75	0,5	0,5	0,5	0,75
E511_Material consumption practices	1,5	1	1,5	1	1,5	1	1	1	1,5 0,666
E52_energy use	0,33333 66667	0,33333	0,333 0,5	0,6666 0,5	0,3333 33333	0,3333 66667	33333	33333	0,5
E521_Renewable energy use target	0	0	0	0	0	0	0	0	0
E522_Energy saving practices	2	1	1,5	1,5	1	2	1	1	1,5
E53_ Waste reduction and disposal	0,5	0,166 66667	0,5	0,333 33333	0,166 66667	0,5	0,5	0,3333 33333	0,5
E531_Waste reduction target	0	0	0	0	0	0	0	0	0
E532_Waste reduction practices	1,5	0,5	1,5	1	0,5	1,5	1,5	1	1,5

C_ECONOMIC RESILIENCE						
C1INVESTMENT	0,6	0,47	0,40	0,33	0,60	0,47
C11_Internal investment	0,	0,6	0,6	0,2	0,6	0,6
C111_Internal investment		3	3	1	3	3
C13_Long ranging investment		0,6	0,4	0,6	1	0,6
C131_long term profitability		5	3	5	5	5
C132_Business plan		1	1	1	5	1
	0,33	0,2	0,2	0,2	0,2	0,2
C14_Profitability	3333	1	1	1	1	1
C141_Net income		1	1	1	1	1
C142_Cost of production		1	1	1	1	1
C143_Price determination						
C2_VULNERABILITY	0,7	0,71	0,71	0,74	0,76	0,56
C21_Stability of production	0,	0,5	0,5	0,5	0,5	0,5
C211_Guarantee of production levels		3	3	3	3	3
C212_Product diversification		2	2	2	2	2
C22_Stability of supply	0,86 6666	0,933 33333	0,9333 33333	0,8666 66667	0,9333 33333	0,9333 33333
C221Procurement channels		5	5	5	5	5
C222_ Stability of supplier relationships		5	5	4	5	5
C223_Dependence on the leading supplier		4	4	4	4	4
C23_Stability of market	0,	0,8	0,8	1	1	0,2
C231_Stability of market		4	4	5	5	1
C24_Liquidity	0,	0,6	0,6	0,6	0,6	0,6
C241_Net cash flow		5	5	5	5	5
C242 Safety Nets		1	1	1	1	1
S_SOCIAL WELLBEING						

S1_DECENT LIVELIHOOD	0,	0,6	0,5	0,6	0,6	0,6
S11_Quality of life	0,	0,4	0,4	0,4	0,4	0,4
S111_Right to quality of life		1	1	1	1	1
S112_Wage level		3	3	3	3	3
S13_Fair access to means of production	0,	0,8	0,6	0,8	0,8	0,8
S131_Fair access to means of production		4	3	4	4	4
S3_LABOUR RIGHTS		1	0,2	1	1	1
S31_employment relations		1	0,2	1	1	1
S311_Employment relations		5	1	5	5	5
S4_EQUITY		1	0,8	0,8	0,8	0,8
S41_Non-discrimination		1	0,6	0,6	0,6	0,6
S411_Non-discrimination		5	3	3	3	3
S42_Gender equality		1	1	1	1	1
S421_Gender equality		5	5	5	5	5
S5_HUMAN SAFETY AND HEALTH	0,7	0,73	0,73	1,00	1,00	0,73

S51_Workplace safety and health provisions	0,73333333	0,2	0,73333333	0,73333333	0,733333333	1	1	0,733333333
S511_Safety and health trainings	1	1	5	1	1	5	5	1
S512_Safety of workplace, operations and facilities	5	1	1	5	5	5	5	5
S513_Health coverage and Access to medical care	5	1	5	5	5	5	5	5