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Circular economy and corporate social responsibility in the agricultural system: Cases study of the Italian agri-food industry

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Abstract: The persistent exploitation of natural resources and the consequent use of consumption are driving global food demand with the result that agricultural activity is becoming less and less environmentally friendly. The circular economy (CE) can become a valid alternative, inserting the economic-agricultural system into the harmonic process of material circulation. The corporate social responsibility (CSR) model is particularly interesting not only because of the ethical dimension of the company but also as a factor of strategic business improvement that combines the concepts of CSR and CE as possible solutions for developing sustainable business processes. The objective of the work is to highlight a detailed framework of how the small and medium-sized enterprises (SMEs) of the Italian agri-food industry can provide an adequate level of communication, circular strategies and social responsibility practices. The research methodology is based on a qualitative multiple study conducted on a sample of nine companies in the Italian territory. The study highlights the attention of companies on the issues of the CE for the achievement of the set sustainable objectives and the attention to CSR and CE practices. The work has several implications. It provides a further understanding of CSR and CE policies as enabling factors for the development of sustainable organizational performance in agriculture. Moreover, it better investigates the relationship between CSR and the CE. Finally, it analyses the SMEs state of the art in the CE field and strengthens the concept of CE by analysing corporate practices consistent with sustainability reports.

Keywords: business models; eco-compatible agriculture; food; sustainability; value creation

The persistent exploitation of natural resources, the increase in population and the consequent use of consumption are driving food demand in the world and as a result, agricultural activity is becoming increasingly intensive and less and less environmentally-friendly (Tsiafouli et al. 2015).

As the population increases, it is estimated that demand for cereals will reach around 3 billion tonnes in 2050. Annual cereal production will have to increase by at least one billion tonnes while meat production will have to increase by more than 200 million tonnes to reach a total of 470 million tonnes in 2050, of which 72% will be consumed in developing countries (FAO 2016).

In Europe, the current agricultural system alone produces about 700 million tonnes of agro-food waste/year whose disposal costs affect both the economy and the environment. The annual collection of biological resources has exceeded the regeneration capacity of the biosphere, therefore the current economic framework, characterised by various environmental and social problems, pushes us to seek and implement alternative methods of sustainable development in various fields and particularly in agriculture (Odum et al. 2018).

The opportunity can be provided by the new circular model that aims to reduce waste, to combat planned obsolescence by extending product life cycles and at the

same time making the most of waste by using economically sustainable processes and procedures to increase its value. The circular economy (CE) can become a valid alternative by placing the economic-agricultural system in the harmonious process of material circulation: recycling, transforming, adapting, renewing materials (Toop et al. 2017).

The study of corporate social responsibility (CSR) practices that can be implemented in integrated business systems can also be important in order to highlight the benefits of the convergence of CSR and CE concepts (Fortunati et al. 2020). The issues of CE, CSR and sustainability in the agricultural sector have been widely discussed by many authors over the years (Esken et al. 2018).

By CE we mean a business model for the creation of added value that gradually leads to the overcoming of the linear model also through forms of social innovation and optimization of business management systems. The CE principles contrast with the traditional linear economic model. The traditional economic model depends on the availability of large quantities of materials and energy that are readily available and at low prices. Raw materials and essential resources for the economy are limited, so the transition to a CE is necessary.

Also, the processes of extraction and use of raw materials produce a strong impact on the environment and increase energy consumption and carbon dioxide emissions: so a more rational use of raw materials can certainly help reduce them for as long as possible (Slavova and Ivanova 2019).

The importance of CSR and the concepts of sustainability, as well as possible contact points, have been the subject of investigation (Rahdari et al. 2016). CSR can be better defined as a concept that goes beyond the simple application of business models but as a complex mechanism of practices that also include concepts that can be traced back to sustainable practices. The CE tries to draw on the more sustainable concepts of CSR and then turn them into practices that can be effectively traced back to models of circularity (Leandro and Paixao 2018).

In light of some recent studies on CSR and corporate brand, an element that plays an important role in achieving optimal communication with all stakeholders is the way to reorganize a company so that the same brand acquires some success (Birim 2016).

The companies that have tried to apply these principles are the most oriented to modify their corporate assets to turn towards the CE sector.

The document focused on sustainability reports and on how the CE was present or not in the sustainabil-

ity reports of agri-food SMEs that we examined to see if it was to be considered a key factor for the relations between the CE and CSR.

In literature, the concepts of CE and CSR are present but do not take into consideration the CE and CSR areas in the agri-food sector and also how the study of certain phenomena leads to improve the perception of the same in the light of the new circular business. Our study wants to fill this gap. The concepts underlying the principles of CSR can find ample space through the study of the logic of models that achieve benefits for businesses in the medium-long term. CSR includes concepts ranging from ethical commitment to the responsibility of workers and the community as a whole. These concepts can be implemented through CE practices.

We examined nine agri-food companies and their respective areas of reference (governance, community, workers, environment) to verify the integration between the social and circular principles.

Our research questions are consequently the following:

Research question 1 (RQ1): Can CSR models be enabling factors for the application of the CE concept?

Research question 2 (RQ2): To what extent can the interaction between CSR and CE areas bring direct and indirect benefits in the short and medium-long term in sustainable agriculture?

In the next sections, we review the relevant literature, present the research methodology, the results obtained and their discussion, and, finally, the conclusions, which includes the implications and limitations of the study, identifying future research activities.

LITERATURE REVIEW

The importance of sustainable agriculture lies in the fact that it does not alter the environmental balance while respecting the environment and social values (Rockström et al. 2017).

Sustainability in agriculture favours attitudes that lead back to natural processes that allow for the preservation of environmental resources by eliminating intensive farming practices and the use of pesticides, for example by increasing the use of renewable energy sources (Engelken et al. 2016).

The definition of sustainable agriculture can also be understood from a social point of view as the ability to respond to the global demand for production (Tirivayi et al. 2016).

From an economic point of view, sustainable agriculture can be considered as beneficial for the protec-

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tion of health and the improvement of the quality of life of farmers and society (Cole and Xiong 2017).

Several agricultural models developed in the last period have tried to put these principles and techniques into practice: biodynamic agriculture (Brock et al. 2019), organic agriculture (Mie et al. 2017), permaculture (Morel et al. 2018), solidarity agriculture (Lee 2020) and organic agriculture (Muller et al. 2017). This is the so-called "sustainable agriculture" which proposes a model based on an ethical code aimed at improving the conditions of workers and the market in which they operate. It promotes activities that can improve the development conditions of disadvantaged populations, endorsing alternative to the existing economic model to search for innovative research models and new business models (Pieroni et al. 2019).

Barrena-Martínez et al. (2015) claim that Dahlsrud's analysis wants to highlight how the contact points attributable to CSR practices refer to different types of actions that in common can lead to concepts of sustainability and respect.

The new value creation model is placed within a business concept with ethical and social aspects that will bring long-term effects (Passeri and Mazzi 2013).

Murray et al. (2017) claim that "the circular economy represents the most recent attempt to conceptualize the integration of economic activity and environmental wellbeing in a sustainable way".

CE has the characteristic of regenerating biological and physical materials (Ellen-MacArthur Foundation 2013). The green economy model is largely overcome to make way for this new concept (D'Amato et al. 2017).

The importance now consists not so much in the mere quantitative aspect but in the qualitative aspect as an added value (Zott and Amit 2010) at the basis of the innovativeness of circularity models without neglecting the economic-financial side (Geissdoerfer et al. 2017).

Sustainability can be seen within every process that carries within it the innovativeness of business models and the principles of the circular economy (Skene and Murray 2017).

Innovativeness leads to substantial changes within the company. In addition, the way of relating with stakeholders is modified, as elements of sustainability are taken into consideration that previously were not the object of pursuit of specific company objectives. This also implies an adjustment of skills and new employment opportunities.

The social factor currently plays an important role and also the practices connected to it and interconnected to which circular behaviour and attention to the

environment and the community can be attributed (Deschenes 2015).

The organization that uses CSR practices is not only oriented towards the realization of the economic and financial dimension, but also implements the social and business dimension. Sustainable corporate competitiveness can be understood as that additional result that includes all the ethical, social and environmental values as well as the brand of the company itself (Lai et al. 2010).

MATERIAL AND METHODS

The Italian agri-food companies selected for multiple benchmarking are: Dolce Bontà limited liability company, Gruppo Pellegrini joint stock company, Terre Cevico agricultural cooperative company, Conserve Italia agricultural cooperative company, CAMST limited liability cooperative company, Andriani joint stock company, Gruppo Caviro joint stock company, Biscottificio Scapigliati limited liability company and Icam joint stock company. All the data under study were extracted from the AIDA Bureau Van Dijk (2020) database as well as from the websites of the companies. Furthermore, the CSR reports and those relating to sustainability and circular economy practices were analysed. The reports subject to consultation are those of the years 2018 and 2019.

Among the various qualitative research approaches, the "grounded theory" methodology has been used.

The method used manages to bring the theories to light through a whole series of information that has been collected. The systematic nature of the data collection also has a flexibility that allows it to give rise to multiple interpretations of the results obtained. This theory also allows data collection and analysis to be carried out simultaneously through the benchmarking process. It also focuses on the particularity of the data from the point of view of clarity and adequacy of the contents. These issues can be described through other types of qualitative methodologies different from each other even if there is no coding at the theoretical level (Cutcliffe 2000).

The choice of companies fell on the sample under study as they are representative in their sector and through the report they proved to be the most attentive in sustainability practices.

RESULTS AND DISCUSSION

Table 1 shows the analysis results of the four companies' areas (governance, community, workers, environment), for each company, fundamental to verify if an interaction between social and circular factors is possible.

Table 1. The analysis results of the four companies' areas (governance, community, workers, and environment)

Company name	Governance	Workers	Community	Environment
Dolce Bontà limited liability company	<p>The identification and continuous involvement of the stakeholders. The achievement of the 17 sustainable development goals established by identifying, based on the stakeholders, the priority reference objectives.</p> <p>The measurement was based on the SMART (Specific, Measurable, Achievable, Relevant and Time-bound) model.</p>	<p>12 hours of training per employee, with specific training sessions related to safety, quality and hygiene of the production process. SA8000 standard greater guarantees for employees.</p>	<p>Company Management System integrated with the Hazard Analysis and Critical Control Points methodology. The company expresses its refusal to use GMOs (Genetically Modified Organisms) for its production. Included in the research plan of the chemical danger Acrylamide. The humidity control of the product has also been included among the tarallo acceptance standards.</p>	<p>About 10% of the company's energy needs are covered by installed photovoltaic panels. British Retail Consortium (BRC) and International Food Standard (IFS) certifications.</p>
Gruppo Pellegrini joint stock company	<p>The Competition and Market Authority has attributed to the company the maximum score required for the legality rating.</p>	<p>The whistleblowing procedure, for the method of transmitting the report with the guarantee of privacy protection.</p> <p>The Code of Ethics.</p> <p>The Organization, management and control model by Italian legislative decree No. 231/2001, discipline of the administrative responsibility of legal persons, companies and associations, including those without legal personality.</p> <p>The Anti-corruption Policy also with the inclusion of the offenses referred to in Italian Law No. 190/2012, provisions for the prevention and repression of corruption and illegality in the public administration. Law provides for preventive and repressive measures against corruption and illegality in the public administration.</p>	<p>Ernesto Pellegrini Onlus Foundation aims to help those who find themselves in a situation of temporary difficulty and have the Ruben Solidale Restaurant as its first and important creation in Milan. The Pellegrini Academy, where research and training collaborate to identify new technical, operational, organizational and management solutions.</p>	<p>UNI EN ISO 22005:2008. Blue Marine Stewardship Council ecolabel. International Food Standard (IFS). OHSAS 18001:2007. UNI 10854:1999. Traceability in the agri-food chains.</p>
Terre Cevico agricultural cooperative company	<p>The company applies the Sao, variable salary by objectives "monthly additional" linked to their commitment to the business and the impact on productivity and profitability. Supplementary Contract Corporate „welfare“, a mechanism to correspond premiums in the facilitated forms provided: expenses for education, leisure, support.</p>	<p>The following training courses interested many employees: Safety course for executives; the dematerialization of cellar registers; high risk and low risk safety. "Pink quotas" represent a total of 38% of the staff. Staff stands out for a low average age: more than 60% of employees are aged between 18 and 48 years old.</p>	<p>The company have implemented the ISO 50001 Energy Management System Certification. It is then expected by September 2020 the ethical certification, according to the SA 8000 standard. BRC and IFC certifications.</p>	<p>In the company, the waste is differentiated and recycled for as much as possible. 22 tonnes of silicone paper has been recycled. Systematic control over waste water sent to the treatment plant (the water is purified in the two plants of Lugo and Forlì, Italy). Participates in the Biowafer project for the enhancement of waste from the agri-food sector that can be used in the production of chemical compounds.</p>

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Table 1 to be continued

Company name	Governance	Workers	Community	Environment
Conserve Italia agricultural cooperative company	<p>The company transfers on the raw material conferred by the producers the added value deriving from the transformation and enhancement activities on the market of finished products.</p> <p>The company orients and plans production based on market trends, the potential of the plants and production needs.</p> <p>The company promotes the commitment to quality throughout the entire business chain, from contributing partners and suppliers, to processing plants up to delivery to end customers.</p> <p>The company invests in research and development to maintain market leadership.</p>	<p>Definition of communication and dialogue plans with employees, shareholders and third parties with whom the company works (institutions and organizations).</p>	<p>The company contributes, with the donation of its products and with direct sponsorships, to support national and regional initiatives and events of sporting and scouting associations and local.</p> <p>The company supports on an ongoing basis, since 1992, the activities carried out by the Food Bank.</p>	<p>Renewal of compressors for compressed air and refrigeration fluids with installation of new modulating models.</p> <p>Acoustic mitigation interventions with installation of sound absorbing barriers.</p> <p>Lighter environmental footprint through Life Cycle Assessment studies.</p> <p>The company increases the Environmental Product Declaration certifications which include the Water Footprint (WFP) and Carbon Footprint.</p>
CAMST limited liability cooperative company	<p>Conscious use and resource efficient environmental ability to enhance human resources and contribute to development of the local community in which the company operates, capacity to maintain development cheap of the company over time.</p> <p>For the company, it is important to collaborate with stakeholders with a spirit of solidarity, an entrepreneurial character and social action for sustainable development.</p> <p>The company defines his welfare as "the set of benefits and services that meet the needs of people's daily lives that the company makes available to its employees, contributing to well-being and greater safety social welfare of workers and their families".</p>	<p>Coordinated vision and action of the various activities of each management and department, at level horizontal and vertical, on shared goals and values.</p>	<p>Reduction of energy consumption based on how much provided by the system of ISO 50001 management.</p> <p>Funds to support around 80 initiatives in the area.</p>	<p>Reduction emissions of CO₂ resulting from use of company vehicles.</p> <p>100% egg from hens to the ground in respect of animal welfare.</p> <p>Calculation of the impact environment of a meal.</p> <p>Certificate of Environmental Saving.</p>
Andriani joint stock company	<p>Integrity and transparency in business activity, promotion of corporate governance inspired by highest standards of ethics, integrity and compliance with laws and regulations.</p> <p>Involvement of the organization in the local reality in which it operates through the definition of specifications policies for hiring, remuneration and management of locally employed personnel.</p> <p>Analysis and management of the indirect economic impacts generated by the business activity.</p>	<p>Development of inclusion, non-discrimination and diversity management policies for minorities.</p> <p>Promotion of professional growth and personal training paths for the organization's employees.</p> <p>Promotion of a shared corporate culture through the implementation of initiatives and programs aimed at to consolidate the set of principles, programs, and common initiatives.</p>	<p>Business development in full respect of local communities; promotion of purpose-based activities educational/training for the development of people and the territory; donations; sponsorships.</p> <p>Promotion of a healthy lifestyle and nutrition education.</p> <p>Control and analysis of the quality standards of the products offered.</p>	<p>Conscious management of waste generated by the organization's activity.</p> <p>Dissemination of a corporate culture aimed at maximizing efficiency in waste management.</p> <p>Responsible and non-invasive management of natural resources with particular attention to containment environmental impacts.</p>

Table 1 to be continued

Company name	Governance	Workers	Community	Environment
Gruppo Cavrio joint stock company	<p>The mission is to enhance the by-products of the Italian agri-food chains applying the best technological skills and process to transform waste into resources and products for various industrial sectors.</p> <p>Business management is based on ethical principles and of maximum transparency. It adopted by time a code of ethics, the organization model, management and control pursuant to the Italian legislative decree No. 231/2001 – discipline of the administrative responsibility of legal persons, companies and associations, including those without legal personality - as well as being a certified company SA8000.</p>	<p>Valorisation of shareholders' participation. Environmental protection relationship with shareholders.</p> <p>Quality of services and products honesty. Impartiality transparency and completeness of information. Fair competition. Value of human resources.</p>	<p>Company of reference in the world of sustainability by adhering to the Equalities standard.</p> <p>It contemplates in a single instrument the environmental, socio-economic dimension and some fundamental ethical values, such as respect for equal gender opportunities and the rejection of all discrimination.</p>	<p>It invested over EUR 100 million to structure a new CE model.</p> <p>The recycling and regeneration of products and materials make it possible to reduce the use of raw materials and energy at source.</p>
Biscottificio Scapigliati limited liability company	<p>Its mission is to produce high quality Tuscan biscuits on the base of traditional family recipes.</p> <p>The company pursues a social responsibility policy and adopts a code of ethics. It is equipped with certified social management systems.</p> <p>Indicators on supplier analysis and inspections. Number of speeches and public communications on CSR. Sales of fair trade products.</p>	<p>Internal satisfaction verification questionnaires; hours of training in addition to the contract training; calculation the number of accidents.</p>	<p>The company has implemented a specific social responsibility project linked to international solidarity.</p> <p>Participation in seminars and conferences, trade fairs, events and awards.</p>	<p>Enhancement of the Tuscan supply chain with low environmental impact the company's commitment to the development of products that use raw materials compatible with the environment and to protect the health of consumers. Organic certification.</p>
ICAM joint stock company	<p>The company producing sustainable and ethical chocolate.</p> <p>It undertakes to guarantee the traceability of all raw materials by creating partnerships with the farmers who remain owners of their lands, to ensure sustainable procurement.</p> <p>The percentage of cocoa purchased from suppliers who have signed the ICAM corporate code of ethics was 35%. In this regard, the company has set itself the goal of increasing this share as much as possible.</p>	<p>Hiring of 52 employees (16 of which women), which brought the total number of employees to 345, of which 94% with permanent contracts. During the past year, a total of 21 674 h were also dedicated to training and the company.</p>	<p>Improvement of education, infrastructure in agricultural communities and training of farmers.</p> <p>The projects started in the Dominican Republic, Uganda and Peru.</p>	<p>Controls and improves the environmental aspects of production and distribution through the use of renewable energy, the control of carbon dioxide emissions, and the use of materials with reduced environmental impact.</p> <p>Reduction of water consumption by 15%, the increase in the percentage of recyclable material for the packaging of chocolate bars for the final consumer, which has reached 92% of the total.</p>

Source: Authors' elaboration

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The detailed analysis of the companies and the reports led to the analysis of different areas in which the company activity takes place (governance, workers, community and environment).

Corporate governance stand out for providing precise indications of its customers and suppliers. Satisfaction questionnaires are also used for any critical issues identified by workers. Privacy is an important element as well

as the management of all corporate private information. Furthermore, the adoption of ethical and quality codes of conduct as well as the adequacy of information.

In the area of workers, the measures on health and safety in the workplace, attention to the adaptation of the premises and the sanitation of the same are particularly important. Furthermore, the professional and cultural growth of the worker is important for the

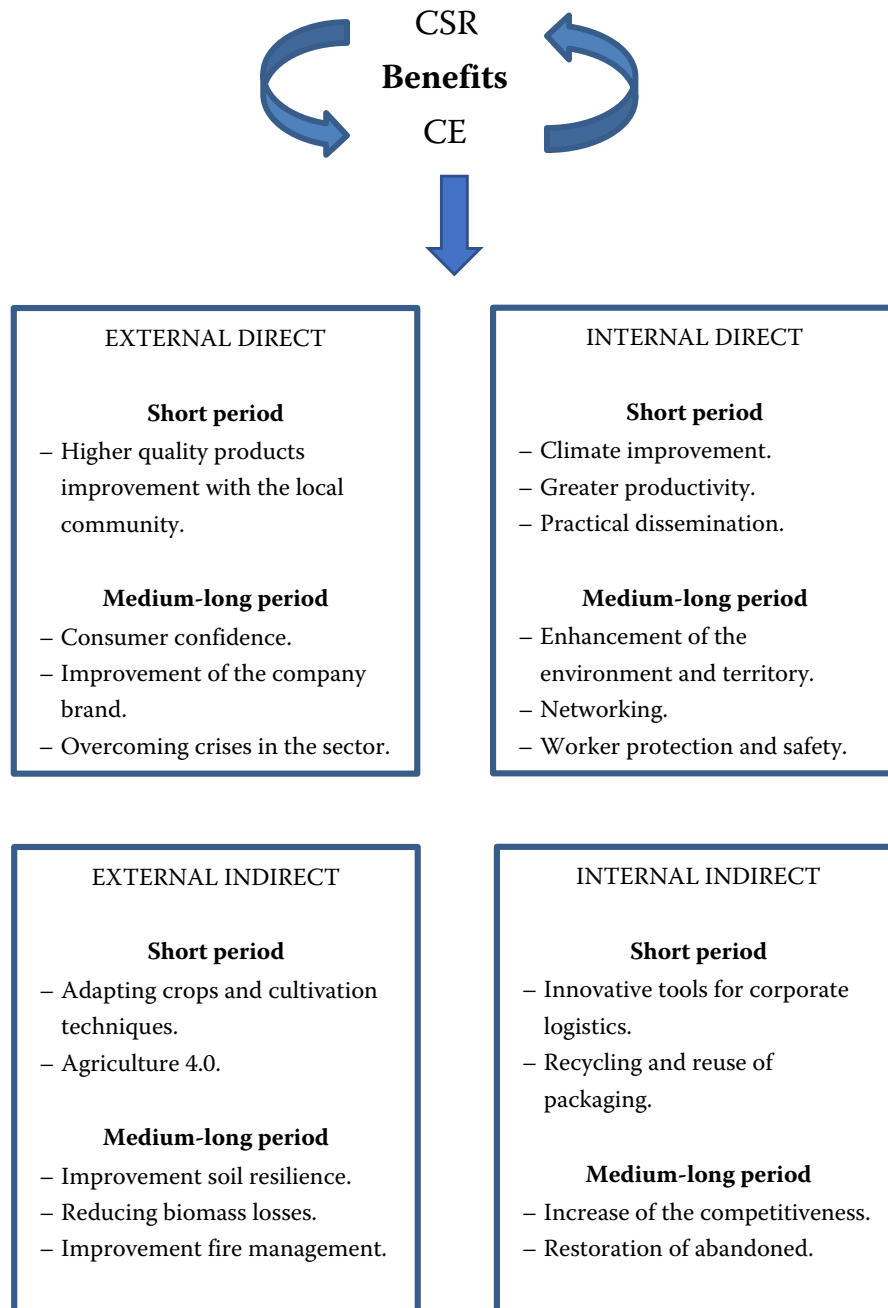


Figure 1. Direct and indirect external and internal benefits based on the interaction between CSR and CE in the agri-food industry

CE – circular economy; CSR – corporate social responsibility

Source: Authors' elaboration

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employer. In fact, training and high professionalism courses able to always provide adequate skills for every required need are organized.

The promotion of social and/or charitable initiatives are the basis of the community area. Social issues such as donations, long distance adoptions, initiatives to promote culture even in disadvantaged areas, sports initiatives or to fight cancer are particularly interesting. In addition, the companies have put in place within the same educational training courses with school and cultural projects in the food sector.

In the area of investigation relating to the environment, all the companies being studied proved to be very active in following and adopting rules and behaviours with a lower environmental impact. All this interest is somehow communicated by the company through the various certifications obtained in the environmental and food fields. The most used are those BRC, IFS and ISO 14000. The practices of reuse, recycling, sharing and reduction of plastic have been pursued by companies also through targeted studies on recyclable packaging.

Many companies adopt certification SA8000 is concerned with setting global workplace standards and includes all existing international agreements, including the conventions of the International Labor Organization, the Universal Declaration of Human Rights and the United Nations Convention on the Rights of the Child. Adopting SA8000 certification means that an organization must consider the social impact of its activities, in addition to the conditions under which employees, partners and suppliers operate. Few of them provide a clear CE target. In some societies, the strategies underlying the CE are not explicitly shown and it seems that they are more linked to traditional models.

The above evaluations are used to answer the first research question (RQ1): *Can CSR models be enabling factors for the application of the CE concept?*

All the companies under study have areas of action and strategies in common and are mostly oriented towards the application of circular economy principles. The strategies on how to communicate their activities are different from each other. Some have dedicated themselves to enhancing the websites of their companies, while others have produced detailed reports on which to highlight all the fundamental social and environmental aspects. From the reports of the companies, it is clear that interconnections can be established between CSR and CE even if on the latter aspect the knowledge of circularity practices should be improved and applied more predominantly within the same companies.

The results supported the literature examined which leads to the combination of CSR, CE and sustainable agriculture concepts and to the identification of a new strategic business model at the base of CSR strategies in circularity. The study was conducted to fill the gap that exists in the literature between the food industry, CSR and CE.

Our study and observations also allow us to answer the second research question (RQ2): *To what extent can the interaction between CSR and CE areas bring direct and indirect benefits in the short and medium-long term in sustainable agriculture?*

It is possible to define a model based on the possible convergence between the CSR and CE areas, and the benefits that can derive from it. The benefits can be external and internal, direct and indirect, and considered in the short-long term with reference to the agri-food industry for the creation of low environmental impact agriculture (Figure 1). Therefore, circularity can be a strategic lever for a sustainable economy.

CONCLUSION

Our study is useful in analysing the interaction between the principles of CSR and CE with a view to sustainable agriculture by verifying the state of the art of SMEs through non-financial reports. The results we obtained were important both theoretically and practically and CE information disclosure can be integrated into a single report that communicates companies' circular strategies. In addition, the results that emerge from companies' CSR reports can be easily observed and used as a reference by many other companies of different sizes.

Companies in the food sector are very sensitive to sustainability issues and are intent on increasingly seeking strategic models of value creation based on circularity policies. All this, however, is sometimes not specifically indicated in the reports or by the actions taken in this area. The companies considered for the comparison have shown that company policies are often aimed at encouraging CE practices internally and externally even if these are often not fully implemented. This leads to an incomplete application of the strategic principles of the circular economy. These results will lead the scientific community and companies in the food sector to a better understanding of the transition to a circular model in which the return on investment is not only economic, but also social.

The study shows a good level of attention by the companies studied to the circularity for the achievement

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of the set sustainable objectives and the attention to CSR and CE practices.

Our research has several implications. First, it contributes to the knowledge of CE and CSR practices in the agri-food sector. It also provides a further understanding of CE and CSR policies as possible enabling factors for the development of sustainable organizational performance in agriculture. Policy makers and managers dealing with CE development policies and CSR models should develop programmes with a clear focus on stimulating initiatives in these specific areas. The study elaborates a general, empirical and integrative theoretical framework.

However, some methodological limitations and problems must be pointed out. The research methodology is based only on secondary sources (mainly CSR reports). In addition, a small sample of SME's was analysed. Future research could be oriented to a larger sample of agri-food companies, using semi-structured interviews or questionnaires to deepen the knowledge of CSR and CE relationships in managerial approaches. Specifically, a study to assess the perception of CSR and CE practices by observers and consumers, and how they influence managerial choice and changes in the business model of agri-food companies could be addressed.

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