COOPERATIVE STRATEGIES AND VALUE CREATION IN SUSTAINABLE FOOD SUPPLY CHAIN

Proceedings of the 54th SIDEA Conference – 25th SIEA Conference Bisceglie/Trani, September 13th - 16th 2017

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PRESENTATION

Talking about food today means referring not only to the act of nutrition – which has always been characterized by universal significance and the purpose of satisfying primary needs – but also to evoke identity values and lifestyles that give a role of primary importance, on the economic-political side as well as in the socio-cultural one, to the agri-food system. The actual and perceived well-being of a community is strongly influenced by the ways and conditions by which the agri-food chain allows access to food. The evolution of the supply chain itself is affected by the progressive spread of sensitivity and awareness in environmental sustainability, health, inequality and poverty, ethics and quality of progress. Two kinds of factors, closely intertwined each other, contribute to complicate the analytical framework just outlined. The first concerns the network of international relations and the dominant economic and food policies in the world. The globalization of markets and communications provokes diversified reactions, ranging from the defence of local sovereignties to the homologation of standards dictated by companies, institutions and international organizations. These are always aimed at the efficiency of transactions, but they pursue often differentiated goals from profit and acquisition of power. The second factor that must be taken into account can be summarized by Bauman's intuition, to which we owe the definition of "liquid society". Here we mean a context, such as the current one of the digital age, in which progress in transport and telecommunications has made the information resource so accessible that, on the one hand, it enhances the individuals' ability to choose and adapt and, on the other, immerse each actor in several different new environments and amplify the conditioning factors. All these elements produce a speed of change of circumstances, real and perceived, which makes extremely "liquid" any kind of relations: from personal to institutional, from commercial to political ones. Therefore,

nevertheless Heraclitus' "panta rei" still maintains its validity over the millennia, the novelty of today – suggests Bauman – is that the river in which we sail flows as fast as it has ever done.

One can easily appreciate, now, that the actual scenario proposes numerous challenges to the agri-food system. They take different forms, such as the volatility of agricultural prices, the growing information asymmetry and the imbalances of bargaining power among the actors in the supply chain, the access to technology and innovations, the diversification of food consumption patterns, the scarcity of natural, environmental and landscape resources, the food waste management and the economic and moral need to fight waste, the food security and safety problems, the climate change, the development of rural territories and communities, the protection and enhancement of social and cultural identities related to food production.

Food supply chains react with similarly compound adaptations to such challenges, so complex and multi-shaped by nature, value and implications. First of all, because these are solicitations coming from different fields, concern material and immaterial contents, take different intensities and affect the different food chain actors in an equally heterogeneous way. The structural composition of the food supply chain determines, on one hand, the distribution of the impacts of such impulses on the individual elements in the chain and, on the other, conditions the capacity to react and implement proactive strategies by the integrated system as a whole.

Equally important, even decisive for the survival of the supply chains itself, is the organizational feature of the agri-food system. To be more precise, we refer to the ways by which the subjects coexist in the system, regulating their relations with functional solutions that can use more or less complex institutional instruments. The nature of the challenges listed above leads the agri-food chain to evolve towards organizational solutions characterized by a high degree of coordination, in the form of both vertical and horizontal integration, through explicit or implicit contracts between the players of the different levels of the food chain. Among such organizational solutions, the participatory mode by the single actors – to be understood as an alternative to the coercive one exercised by some dominant subjects – can lead to more effective, balanced and stable results over time. Furthermore, the conditions for effective value creation along the supply chain and the promotion of the development of agri-food districts through the cooperation, the strengthening of social cohesion, the protection of the environment and the support to the innovation are set up. The agricultural and cohesion policies of the European Union support the adoption of lasting horizontal and vertical relationships

among the operators in the food supply chain based on the cooperation between the different actors in rural areas.

All these arguments considered, to investigate horizontal and vertical cooperation in the agri-food systems as well as the conditions that favor its development becomes a primary duty of those who want to deepen their knowledge of the physiology of supply chains and to supply useful elements to support strategic and political decisions on food production and distribution. The lato sensu cooperation represents a useful framework for drawing sustainable development trajectories for the entire supply chain. With reference to this argument, the research perspectives branch out in the distribution of benefits along the value chain, in the regulation of agricultural supply, in the social responsibility of multifunctional firms, in the promotion of technological, organizational and social innovation and in food safety guarantees.

About these issues, the Italian Society of Agricultural Economics (SIDEA) and the Italian Society of Agri-Food Economics (SIEA) have decided to promote, for the first time in their history, a joint conference of studies. The event, organized by the researchers of agricultural and food economics working at the University of Foggia under the supervision of prof. Francesco Contò, was held in the town of Bisceglie (BT) on 13th-16th September 2017. It was attended by about 150 scholars of economic disciplines of the agricultural and food sector from all the academic sites of the country and the main Centers of specialized research. More than 100 scientific contributions were discussed, while several Italian and foreign speakers from the research as well as from institutions and companies were invited to take extensive readings on the issues of cooperation in the food supply chains. The conference ended with a special session, held at the Fiera del Levante in Bari, dedicated to the cooperation between university research and public administration in order to promote the development of the agri-food supply chain. There have been three days of intense and fruitful debate which, with no doubt, will leave a mark in the history of the agrarian and agri-food economists community and in the personal lives of all of us who have been part of it.

Believing that the road to cooperation, even between scientific societies with different research interests, is the right one, we express our satisfaction for the success of the event, of which we collect the acts here, and thank all those who contributed in various ways, even simply by their participation, to make our hopes come true.

Francesco Marangon
President SIDEA

Pietro Pulina
President SIEA

 ISBN 9788891786883

PREFAZIONE

Parlare di cibo oggi significa fare riferimento non solo all'atto dell'alimentazione – da sempre caratterizzato da una connotazione universale e dalla finalità della soddisfazione di bisogni primari – ma anche evocare valori identitari e stili di vita che fanno sì che, come mai in passato, l'intero sistema produttivo-distributivo che fa riferimento all'agricoltura e alle connesse attività trasformative e commerciali abbia assunto un ruolo di primaria importanza sul piano economico-politico come in quello socio-culturale. Il benessere effettivo e quello percepito da una collettività sono fortemente influenzati dalle modalità e condizioni con le quali il sistema agro-alimentare consente l'accesso al cibo, così come l'evoluzione della stessa catena di offerta risente della progressiva diffusione di sensibilità e consapevolezza in materia di sostenibilità ambientale, salute, diseguaglianza e povertà, etica e qualità del progresso.

A complicare il quadro analitico appena tracciato per sommi capi concorrono due ordini di fattori non trascurabili e strettamente interconnessi. Il primo riguarda il quadro delle relazioni internazionali e delle politiche economiche e alimentari. La globalizzazione dei mercati e delle comunicazioni provoca reazioni diversificate, che vanno dalla difesa delle sovranità locali all'omologazione di norme e standard commerciali dettati da imprese, istituzioni e organizzazioni internazionali sempre tese all'efficienza delle transazioni, ma che perseguono finalità spesso differenziate rispetto alla ricerca del profitto e dell'acquisizione di posizioni di potere. Il secondo fattore di cui occorre tener conto può esser sintetizzato dalla felice intuizione di Bauman, al quale dobbiamo la definizione di "società liquida", laddove si intende un contesto, quale quello attuale, in cui il progresso nel settore dei trasporti e, soprattutto, delle telecomunicazioni che ci ha condotto all'odierna era digitale ha reso la risorsa informativa talmente accessibile da potenziare, da una parte, le capacità di scelta e di adattamento dei soggetti e, dall'altro, di im-

mergere ciascun individuo in una molteplicità di contesti che ne amplificano i fattori di condizionamento. Il tutto si traduce in una velocità di cambiamento delle circostanze, reale e percepita, che rende estremamente "liquide" le relazioni a tutti i livelli: da quelle personali, a quelle istituzionali, commerciali e politiche. Se dunque il "panta rei" di Eraclito mantiene nei millenni la sua validità, la novità di oggi – suggerisce Bauman – è che il fiume nel quale navighiamo scorre impetuoso come mai ha fatto.

Il contesto di riferimento propone dunque numerose sfide al sistema agro-alimentare. Esse assumono forme diverse, come la volatilità dei prezzi agricoli, la crescente asimmetria informativa e gli squilibri del potere contrattuale tra gli attori della filiera, l'accesso a tecnologia e innovazioni, la diversificazione dei modelli di consumo alimentare, la scarsità delle risorse naturali, ambientali e paesaggistiche, la gestione dei rifiuti alimentari e la necessità economica e morale di combattere gli sprechi, i problemi di sicurezza alimentare declinati nelle accezioni di *safety* e *security*, il cambiamento climatico, la tutela dell'ambiente, lo sviluppo dei territori e delle comunità rurali, la tutela e la valorizzazione di identità sociali e culturali connesse all'attività di produzione di cibo.

Di fronte a queste sfide, complesse e multiformi per natura, valenza e implicazioni, le filiere che provvedono alla produzione e distribuzione di cibo reagiscono in maniera altrettanto articolata e difficilmente schematizzabile. Innanzitutto, perché si tratta di sollecitazioni che provengono da diversi ambiti, riguardano contenuti materiali e immateriali, assumono intensità differenziate e colpiscono in maniera altrettanto eterogenea i diversi soggetti che concorrono alla realizzazione dell'alimento finito. Proprio la composizione strutturale e specificamente identitaria della filiera *food*, dal canto suo, determina, da un lato, la distribuzione delle ricadute di tali impulsi sui singoli anelli della catena e, dall'altro, condiziona le capacità di reazione e di realizzazione di strategie proattive da parte del sistema integrato nel suo complesso.

Altrettanto importante, anzi decisiva ai fini della sopravvivenza stessa delle filiere, è la componente organizzativa. Si tratta, in altri termini, delle modalità con le quali i diversi soggetti coesistono nel sistema, regolando le proprie relazioni con soluzioni funzionali che possono avvalersi di strumenti istituzionali più o meno complessi. La natura delle sfide appena enumerate induce la filiera agro-alimentare a evolversi verso forme organizzative caratterizzate da un elevato grado di coordinamento, in forma di integrazione sia verticale sia orizzontale, attraverso contratti espliciti o impliciti tra gli attori dei diversi livelli della catena alimentare. In tali soluzioni organizzative, la modalità partecipata da parte dei singoli attori, alternativa a quella coercitiva esercitata da alcuni soggetti dominanti, può condurre ad esiti più efficaci,

equilibrati e stabili nel tempo. Attraverso la cooperazione, inoltre, si allestiscono i presupposti adatti a un'efficace creazione di valore lungo la filiera e alla promozione dello sviluppo di territori e distretti agro-alimentari attraverso il rafforzamento della coesione sociale, la tutela dell'ambiente e il supporto all'innovazione. Le politiche agricole e di coesione dell'Unione Europea supportano l'adozione di durature relazioni orizzontali sia verticali tra gli operatori della filiera alimentare improntate sulla cooperazione tra i diversi attori nelle zone rurali.

Per questo, indagare sulle modalità di cooperazione orizzontale e verticale nei sistemi agro-alimentari e sulle condizioni che ne favoriscono lo sviluppo diventa un dovere primario di chi intende approfondire la conoscenza della fisiologia delle catene di offerta e proporre elementi utili al supporto delle decisioni strategiche e politiche in materia di produzione e distribuzione di cibo. La cooperazione *lato sensu* rappresenta un paradigma utile per tracciare traiettorie di sviluppo sostenibile per l'intera filiera. A questo proposito, le prospettive di ricerca si ramificano nella distribuzione dei benefici lungo la catena del valore, nella regolazione dell'offerta agricola, nella responsabilità sociale delle imprese multifunzionali, nella promozione dell'innovazione tecnologica, organizzativa e sociale e nelle garanzie di sicurezza alimentare.

Intorno a questi temi, la Società Italiana di Economia Agraria (SIDEA) e la Società Italiana di Economia Agro-Alimentare (SIEA) hanno deciso di promuovere, per la prima volta nella loro storia, un convegno congiunto di studi. L'evento, organizzato dai ricercatori di economia agraria e agro-alimentare di stanza presso l'Ateneo di Foggia sotto il coordinamento del prof. Francesco Contò, si è tenuto nella località di Bisceglie (BAT) tra il 13 e il 16 settembre 2017. Ad esso hanno partecipato circa 150 studiosi delle discipline economiche del settore agricolo e alimentare provenienti da tutte le sedi accademiche del Paese e dai principali Centri di Ricerca specializzati. Sono stati discussi più di 100 contributi scientifici, mentre diversi relatori italiani e stranieri, appartenenti al mondo della ricerca e a quello delle istituzioni e delle imprese, sono stati invitati a tenere letture di ampio respiro sulle tematiche della cooperazione nelle filiere food. Il convegno si è concluso con una sessione speciale, tenutasi presso la Fiera del Levante a Bari, dedicata alla cooperazione tra ricerca universitaria e pubblica amministrazione al fine della promozione dello sviluppo della filiera agro-alimentare. Sono stati tre giorni di dibattito intenso e fruttuoso che, non abbiamo dubbi, lasceranno il segno nella storia della comunità degli economisti agrari e agro-alimentari e in quelle personali di tutti noi che ne abbiamo fatto parte.

Nella convinzione che la strada della cooperazione, anche tra società scientifiche portatrici di interessi differenti, sia quella giusta, esprimiamo la

nostra soddisfazione per la riuscita dell'evento, di cui qui raccogliamo gli atti, e ringraziamo tutti coloro che hanno contribuito a vario titolo, anche solo semplicemente con la loro partecipazione, a far sì che le nostre speranze siano divenute realtà.

Francesco Marangon
President SIDEA

Pietro Pulina
President SIEA

 ISBN 9788891786883

INTRODUCTION

"Do not aspire to too high things, bend instead to the humble ones" according to St. Paul (Rom. 12, 16).

In this spirit, I would like to briefly introduce this book that contains the proceedings of the LIV Conference SIDEA and the XXV Convention SIEA, which were organized by the Department of Economics of the University of Foggia, for the first time, with the formula of a joint Conference titled: "**Cooperative strategies and value creation in sustainable food supply chain**", held in Bisceglie-Trani, from 13th to 16th September 2017.

The scientific debate, promoted among the members of the two scientific societies and with the stakeholders of the agri-food sector and of the local development, has been focused on the **strategies of cooperation** between the different actors and territories and on the **creation of value** in the food supply chain.

The food supply chain connects three important sectors of the European economy (agriculture, the food processing industry and the distribution sectors) that are essential for economic, social and environmental welfare as well as for the health of European citizens.

In the longer run, a better functioning food supply chain is crucial for consumers and for ensuring a sustainable distribution of value added along the chain, thus contributing towards raising its overall competitiveness.

However, sectors of the food supply chain are facing new and complex global challenges: agricultural prices volatility, globalization processes, growing asymmetrical information, asymmetry of bargaining power, increased concentration of wholesalers, retailers and supermarket chains, gaps in access to technology and innovations, food consumption patterns, resources scarcity, excessive of food waste, food security and food safety issues, climate change, environmental protection, etc.

To face most of this challenges, and considering that in market economies one of the main success factors of competitiveness is the ability to cooperate, the food supply chain is evolving towards new organizational forms characterized by a greater degree of coordination, in form of either vertical or horizontal integration of explicit and implicit contracts between players of different levels of the food chain.

Cooperative enterprises constitute a relevant and, at the same time, differentiated set within the agro-industrial system. Therefore, there is a growing need to investigate through appropriate taxonomies the set of co-operative forms and, to understand the contribution of cooperation to resources exploitation in the different stages of the value chain and in different territories.

In this view, 'cooperation' conceived as fair collaboration among the involved actors in the food supply chain either horizontal (cooperatives between farmers, food processing or distribution companies, producers associations, etc.), or vertical (along the food SC), diagonal (research and innovation networks, networks between firms and research institutions, etc.) or mixed (buying groups, consortia, group purchasing organizations, transnational networks, etc.) and between territories and/or their stakeholders, represents an effective strategy to address the aforementioned challenges and to give efficient and effective responses in terms of economic, social and environmental sustainability.

In addition, cooperation represents a source of added value and a strategic development tool also for territories, in order to pursue social cohesion, economic development and environmental protection, and for the integration of different areas with a focus on innovation, territorial identity, territorial and transnational alliances, and of the most vulnerable social groups.

To this aim, strengthening cooperation is a major priority of the European Commission that aims at promoting lasting vertical and horizontal market-based relationships between the operators of the food chain and collaboration of different actors in rural areas. In particular, the CAP 2014-2020, provides financial supports to all cooperation forms among different actors in agriculture sector, forestry sector and food chain and other actors of rural development policy, including producer groups, cooperatives and interbranch organizations.

Given these considerations, cooperation in all its forms represents a valuable paradigm to define new horizons of development and build new organizational models of value creation according to a sustainable approach not referred to a single unit but to the entire supply chain. Consequently, research perspectives affect the value added distribution issues along the value chain, the agricultural supply regulation, the social responsibility, the ability to

offer a higher degree of food safety, and the promotion of organizational and social innovation.

Nevertheless, these concepts, which are valid in themselves, risk being infected by an exasperating interpretation of the current productivist logic. Thus, these lose sight of the same value of those cooperative strategies and of the logic of fair distribution of the value generated within the agri-food supply chains, that this conference has debated.

In this regard, I would like to mention a beautiful sentence by Luigi Einaudi: "Thousands, millions of individuals work, produce and economize despite everything we can invent to harass them, jam them, discourage them. It is the natural vocation that drives them, not just the thirst for profit. The taste, the pride of seeing one's company prosper, buy credit, inspire confidence in ever-expanding customers, expanding the facilities are a spring of progress as powerful as the profit. If not, it would not explain how there are entrepreneurs who in their company lavish all their energy and invest all their capital to often withdraw far more modest profits than they could surely and comfortably get with other commitments".

This is my representation of agricultural entrepreneurs that are the first step both in the agro-food and in the environmental supply chain.

Agricultural entrepreneurs represent, above all today, the most authentic example of the values and principles of the circular economy that must animate and pervade all the virtuous supply chains of the Italian and European agri-food system. All this, in the midst of a tremendous environmental and economic crisis afflicting our territory and the Country.

I would like to refer the concept of an agri-food chain, considering a speech of Pope Francesco during his recent visit to Genoa (2017): "the emphasis on competition within companies (editor's note: that form agri-food chains), in addition to being an anthropological and Christian error, is also an economic mistake, because it forgets that the essence of economic relations is first of all cooperation, mutual assistance, reciprocity. When a supply chain organization scientifically creates a system of incentives that put farms and, often even those of transformation, in competition with each other, perhaps in the short term it can generate some advantages, but it soon ends up undermining that fabric of trust that is the soul of every organization. And so, when a crisis comes, the company breaks down and implodes, because there is no longer any rope that holds it".

We have to strongly say that this culture of exasperated competition among the companies in the supply chain, is a mistake and, therefore, outlines a dangerous vision that must be change to the good of our agri-food

chains, workers and the territorial economy in which they they are inserted, as well as the environment in which they work and produce.

This economic culture leads more and more to consider the "weak" productive sectors as "undeserving" economic activities and, therefore, guilty of their own state of succumbing with respect to the other stages of the sectors in which agriculture works.

And if the "poverty" of the primary sector is the fault of the same agriculture, the processors and distributors are exempt from doing something. This is the logic of Giobbe's friends, who wanted to convince him that he was guilty of his misfortune.

In this regard, an aphorism of the great Leo Longanesi reminds me: "when the doorbell of their conscience rings (editor's note: the processors and, above all, the distributors) pretend not to be at home".

In this absence, they are well accompanied by the behavior and the rules of the European Union, by international decisions on global trade and by the character assassination relating to a foolish abuse of the delicate tool of "economic sanctions" affecting the weakest sectors and territories.

Compared to all this, Italian agricultural economists wanted to reflect on how to bring the **issue of cooperation** back to the center of economic logic and the governance of agri-food supply chains, also in relation to the use of environmental factors, which must be increasingly aimed at respect of the principles and values of the circular economy.

In this framework, the **thematic areas**, in which the **First Joint SIDEA-SIEA Conference** was structured, have allowed us to investigate the issue in all its aspects, starting from the analysis of the main production and consumption models, up to organizational models, forms of territorial, sectoral and environmental cooperation, and policies with which to add value to the supply chain.

In particular, the scientific debate concerned the following sessions:

Cooperation patterns of production and consumption

- Agro-food cooperatives
- Producers Organizations
- Clusters, networks and districts
- Operational Groups in the European Innovation Partnership
- Technology and manufacturing districts
- Food supply chain and district contracts
- Sustainable food supply chain management
- Sustainable fishing and aquaculture
- Sustainable models of food consumption (new cooperative structures)
- Associations for the protection and enhancement of the quality of the productions

Organizational models and strategies

- Environmental, economic and social sustainability of food production models
- Creating shared value in the food supply chain
- Cooperative relations in agro-food supply chains
- Value-creating networks (firms and areas)
- Innovation and integration in the agro-food cooperatives
- Regulation and organizational change in the governance of agro-food cooperatives
- Vertical markets and cooperative hierarchies
- The resilience of the cooperative form
- Governance of Alliances and Cooperatives

Territorial cooperation and local development

- Governance structures and mechanisms in rural territories
- Smart land and smart agriculture
- Rural and urban areas governance
- Inland and coastal areas governance
- Areas and local sustainable communities
- Social farming and social inclusion
- Integrated design of filieres and territories

Policies for cooperation in the food supply chain

- Policy instruments and tools for food supply chain development
- European networks, research and innovation
- Innovation Policies
- International trade, food security and development
- Policies for food quality and safety
- Circular economy and green agriculture
- Efficiency of distribution and food waste

The Conference, organized into four days, was divided also into two plenary sessions, during which the following reports were presented:

- **Cooperative business model for the new agriculture** (Prof. Kostas Karantininis, Swedish University of Agricultural Sciences);
- **Vertical coordination in food supply chains: challenges and perspectives** (Prof. Alessandro Banterle, University of Milan);
- **Consumers and modern food chains: preferences, evolution and new research questions** (Prof. Teresa del Giudice, University of Naples "Federico II");
- **Decision rights, Agro-industry organization and Cooperation (Prof.** Gaetano Martino, University of Perugia);

- **Cooperation and economic organisation of agriculture in the CAP** (Prof. Alessandro Pacciani, The Georgofili Academy and President of the Center for studies of the economic organization and of rural development);
- **Granoro Dedicato: 100% Apulian supply chain pasta** (Marina Mastromauro, CEO Pastificio Attilio Mastromauro GRANORO Srl);
- **Features and performances of Italian food industry in the recent critical period** (Luigi Pelliccia, Federalimentare, Director of Office Market Studies).

Plenary sessions were followed by parallel sessions:

- social farming and social inclusion;
- rural development;
- statistical method and applications for agri-food sector;
- corporate social responsibility and agricultural work;
- food waste;
- circular economy;
- firm strategies and competitiveness;
- consumer behaviour and food systems;
- environmental and economic sustainability;
- territorial cooperation and food production;
- trend and policies in the food supply chain;
- research and innovation;
- territorial coordination;
- cooperation and governance;
- sustainability and animal welfare;
- cooperation and strategies;
- food supply chain;
- food innovation and consumers' acceptance.

The first day, moreover, a pre-conference event was held entitled "Circular economy and innovation of the agricultural sector", while on the last day the study meeting was held "Cooperation between University and Public Administration for the development of the agro-food sector" at the Fiera del Levante in Bari.

This book collects a selection of abstracts of the numerous contributions presented during the Conference, both in the plenary sessions and in the parallel sessions.

One of the greatest Italian chefs, Massimo Bottura, affirmed that: "knowledge generates conscience and this, in turn, responsibility".

We hope, therefore, that the seed thrown into the conference of Bisceglie can bear fruit and win many of the dullness that, unfortunately, circulate in

our Country, in Europe and in the world. Even among the so-called scholars and experts of the subject.

Tolstoy affirmed: "everyone thinks about changing humanity and nobody thinks about changing himself".

Thanks to this conference, I would like the Italian agricultural economists may have contributed to disprove the pessimism of the great Russian playwright and to start a serious reflection on the need to review some economic paradigms that, if not corrected in time, risk to compromise the future of young people and the most fragile territories of our Country and many other parts of the world, with heavy consequences in terms of: abandonment, environmental disasters, demographic imbalances, uncontrollable migrations and social tensions.

If these 'evils' are well valued economically, in terms of public spending and cost-benefit analysis, far outweigh positive results that the current dominant economic thinking and the European and world policy makers believe to achieve by continuing to carry forward a logic of pseudo productive efficiency: the latter is based on an exasperated competition between economic sectors and territories, on the looting of environmental resources and on the exploitation of the weakest people.

By paraphrasing Longanesi, we could argue that we would continue to rely on characters, scholars and politicians: "good for nothing but capable of everything".

I hope the reading of the works contained in this volume deletes these my pessimistic predictions thus starting a new trend of cooperation at all levels that "contagious" all the aforementioned political and economic stakeholders involved in these processes.

Finally, it should be also noticed that this Conference, held under the sponsorship of the University of Foggia, obtained the contribution of the Apulia Region, the sponsorship of the Ministry of Agricultural, Food and Forestry Policies, of the Council for Agricultural Research and Economics (CREA), of the Province of Foggia, of the Province of Lecce, of the Metropolitan City of Bari, of the Municipality of Bisceglie, of the Terre d'Apulia Land Reclamation Consortium, of the Ponte Lama LAG and of many companies and operators of agri-food chains and of the fisheries sector, to which we owe our gratitude and our commitment to continue on this path.

Francesco Contò
President of the Program Committee

 ISBN 9788891786883

PREMESSA

"Non aspirate a cose troppo alte, piegatevi invece a quelle umili", dice S. Paolo in un passo della lettera ai Romani (Rm, 12, 16).

Con questo spirito, mi accingo ad introdurre brevemente questo volume che racchiude gli atti del LIV Convegno SIDEA e del XXV Convegno SIEA, che sono stati organizzati dal Dipartimento di Economia dell'Università di Foggia, per la prima volta, con la formula di una Conferenza congiunta dal titolo: **"Strategie cooperative e creazione del valore in una filiera alimentare sostenibile"**, svoltasi a Bisceglie-Trani, dal 13 al 16 settembre 2017.

Il dibattito scientifico, promosso tra i membri delle due società e con gli stakeholders del settore agroalimentare e dello sviluppo locale, è stato incentrato sulle **strategie di cooperazione** tra i diversi attori e territori e sulla **creazione di valore** nella filiera alimentare.

La filiera alimentare collega tre importanti settori dell'economia europea (agricoltura, industria alimentare e distribuzione) che sono essenziali per il benessere economico, sociale e ambientale, nonché per la salute dei cittadini.

Nel lungo periodo, un migliore funzionamento della filiera alimentare è di fondamentale importanza per i consumatori e per assicurare una distribuzione sostenibile del valore aggiunto lungo tutta la filiera, contribuendo quindi al miglioramento della competitività della stessa.

Tuttavia, i diversi settori della filiera alimentare si trovano ad affrontare sempre nuove e più complesse sfide a livello globale: la volatilità dei prezzi agricoli, i processi di globalizzazione, la crescente asimmetria informativa, l'asimmetria del potere contrattuale, la crescente concentrazione di grossisti, dettaglianti e delle catene di supermercati, le difficoltà di accesso a tecnologia e innovazioni, i modelli di consumo alimentare, la scarsità delle risorse, l'eccesso di rifiuti alimentari, i problemi di sicurezza alimentare, il cambiamento climatico, la tutela dell'ambiente, ecc. sono tra le più importanti.

Per affrontare al meglio la maggior parte di queste sfide, e considerando che nelle economie di mercato uno dei principali fattori di competitività è la capacità di cooperare, la filiera alimentare si sta evolvendo verso nuove forme organizzative caratterizzate da un elevato grado di coordinamento, in forma di integrazione sia verticale sia orizzontale attraverso contratti espliciti o impliciti tra gli attori dei diversi livelli della catena alimentare.

Le imprese cooperative costituiscono un rilevante e, allo stesso tempo, differenziato insieme all'interno del sistema agroindustriale. Pertanto, vi è una crescente necessità di studiare, attraverso appropriate tassonomie, l'insieme delle forme cooperative e di capire il contributo della cooperazione allo sfruttamento delle risorse nelle diverse fasi della filiera e nei diversi territori.

In questa ottica, la "cooperazione" intesa come vera collaborazione tra tutti gli attori coinvolti nella filiera alimentare sia orizzontale (cooperative tra agricoltori, tra industrie alimentari o imprese di distribuzione, associazioni di produttori, ecc.) sia verticale (lungo la filiera stessa), diagonale (reti di ricerca e di innovazione, reti tra imprese e istituti di ricerca, etc.) o mista (gruppi di acquisto, consorzi, organizzazioni di gruppi di acquisto, reti transnazionali, ecc.) e tra i territori e gli stakeholder al loro interno, rappresenta una strategia in grado di affrontare le sfide sopra citate e di dare risposte efficienti ed efficaci in termini di sostenibilità economica, sociale e ambientale.

Inoltre, la cooperazione rappresenta una fonte di valore aggiunto e uno strumento strategico di sviluppo anche per i territori, al fine di perseguire la coesione sociale, lo sviluppo economico e la tutela dell'ambiente, l'integrazione delle diverse aree con una particolare attenzione a temi come l'innovazione, l'identità territoriale, le alleanze territoriali e transnazionali, e ai gruppi sociali più vulnerabili.

Il rafforzamento della cooperazione è una delle principali priorità della Commissione Europea che mira a promuovere relazioni di mercato durature sia orizzontali sia verticali tra gli operatori della filiera alimentare nonché la collaborazione tra i diversi attori nelle zone rurali. In particolare, la PAC 2014-2020, finanzia tutte le forme di cooperazione tra i diversi attori del settore agricolo, il settore forestale e la filiera alimentare e gli altri attori della politica di sviluppo rurale, compresi i gruppi di produttori, le cooperative e le organizzazioni interprofessionali.

Alla luce di queste considerazioni, la cooperazione in tutte le sue forme rappresenta un paradigma valido per definire nuovi orizzonti di sviluppo e costruire nuovi modelli organizzativi di creazione di valore, secondo un approccio sostenibile non riferito alla singola unità, ma all'intera filiera. Di conseguenza, le prospettive di ricerca riguardano le problematiche di distribuzione del valore aggiunto lungo la catena del valore, la regolazione dell'offerta agri-

cola, la responsabilità sociale, la capacità di offrire un maggior grado di sicurezza alimentare e la promozione dell'innovazione organizzativa e sociale.

Tuttavia, questi concetti di per sé validi, rischiano di essere contagiati da un'esasperante interpretazione delle logiche produttivistiche attuali e perdere, così, di vista lo stesso valore di quelle strategie cooperative e delle logiche di equa distribuzione del valore che si genera all'interno delle filiere agroalimentari che questo convegno ha dibattuto.

Vorrei, a questo proposito, citare una bella frase di Luigi Einaudi: "Migliaia, milioni di individui lavorano, producono e risparmiano nonostante tutto quello che noi possiamo inventare per molestarli, incepparli, scoraggiarli. È la vocazione naturale che li spinge, non soltanto la sete di guadagno. Il gusto, l'orgoglio di vedere la propria azienda prosperare, acquistare credito, ispirare fiducia a clientele sempre più vaste, ampliare gli impianti costituiscono una molla di progresso altrettanto potente che il guadagno. Se così non fosse, non si spiegherebbe come ci siano imprenditori che nella propria azienda prodigano tutte le loro energie e investono tutti i loro capitali per ritirare spesso utili di gran lunga più modesti di quelli che potrebbero sicuramente e comodamente ottenere con gli altri impegni".

Questa è la mia raffigurazione degli imprenditori agricoli, di quel primo anello sia della filiera agro-alimentare che di quella ambientale.

Gli imprenditori agricoli rappresentano, soprattutto oggi, nel pieno di una tremenda crisi ambientale ed economica che affligge il nostro territorio ed il Paese, l'esempio più autentico dei valori e dei principi dell'economia circolare che deve animare e pervadere tutte le filiere virtuose del sistema agroalimentare italiano ed europeo.

Vorrei, qui, riportare e, in un certo qual senso, parafrasare e contestualizzare al concetto di filiera agroalimentare, un passaggio dell'intervento fatto da Papa Francesco in occasione di una sua recente visita a Genova (nel corso del 2017): "l'accento sulla competizione all'interno delle imprese (n.d.r. che formano le filiere agroalimentari), oltre ad essere un errore antropologico e cristiano, è anche un errore economico, perché dimentica che l'essenza dei rapporti economici è prima di tutto cooperazione, mutua assistenza, reciprocità. Quando un'organizzazione di filiera crea scientificamente un sistema di incentivi che mettono le aziende agricole e, spesso anche quelle di trasformazione, in competizione fra loro, magari nel breve periodo può generare qualche vantaggio, ma finisce presto per minare quel tessuto di fiducia che è l'anima di ogni organizzazione. E così, quando arriva una crisi, l'azienda si sfilaccia e implode, perché non c'è più nessuna corda che la tiene".

Bisogna dire con forza che questa cultura di esasperata competizione tra le imprese della filiera, rappresenta un errore e, quindi, delinea una visione peri-

colosa che va cambiata: se vogliamo il bene delle nostre filiere agroalimentari, dei lavoratori e dell'economia territoriale in cui esse sono inserite, nonché dell'ambiente in cui esse operano e producono.

Questa cultura economica porta sempre più a considerare i settori produttivi "deboli" come attività economiche "non meritevoli" e, quindi, colpevoli del loro stesso stato di soccombenza rispetto agli altri stadi delle filiere in cui l'agricoltura opera.

E se la "povertà" del settore primario è colpa della stessa agricoltura, i trasformatori ed i distributori sono esonerati dal fare qualcosa. Questa è la vecchia logica degli amici di Giobbe, che volevano convincerlo che fosse lui il colpevole della sua sventura.

Mi sovviene, a questo proposito, un aforisma del grande Leo Longanesi: "quando suonano il campanello della loro coscienza (n.d.r.: i trasformatori e, soprattutto, la grande distribuzione) fingono di non essere in casa".

In questa assenza, sono bene accompagnati dal comportamento e dalle regole dell'Unione Europea e dalle decisioni internazionali sul commercio globale e dal gioco al massacro relativo ad un dissennato abuso dello strumento delicato delle "sanzioni economiche" che colpisce i settori ed i territori più deboli.

Rispetto a tutto questo, gli economisti agrari italiani hanno voluto riflettere su come potere riportare la **tematica della cooperazione** al centro della logica economica e del governo delle filiere agroalimentari, anche in relazione all'utilizzo dei fattori ambientali, che dovrà essere sempre più finalizzato al rispetto dei principi e dei valori dell'economia circolare.

In linea con questo quadro, le **aree tematiche,** in cui è stata strutturata la **First Joint SIDEA-SIEA conference,** hanno permesso di approfondire la questione in tutti i suoi aspetti, a partire dall'analisi dei principali modelli di produzione e consumo, fino ai modelli organizzativi, alle forme di cooperazione territoriale, settoriale e ambientale, e alle politiche con cui aggiungere valore alla filiera.

In particolare, il dibattito scientifico ha riguardato le seguenti sessioni scientifiche:

Modelli cooperativi di produzione e consumo

- Cooperative agro-alimentari
- Organizzazioni di produttori
- Cluster, reti e distretti
- Gruppi Operativi nei Partenariati Europei per l'Innovazione
- Distretti tecnologici e manifatturieri
- Contratti di filiera e di distretto
- Gestione sostenibile della filiera alimentare
- Pesca e acquacoltura sostenibili

- Modelli sostenibili di consumo (nuove strutture cooperative)
- Associazioni per la tutela e miglioramento della qualità delle produzioni

Modelli organizzativi e strategie

- Modelli di produzione alimentare sostenibili
- Creazione di valore nella filiera
- Relazioni cooperative nella filiera alimentare
- Reti di creazione del valore (aziende e territori)
- Innovazione e integrazione nelle cooperative agro-alimentari
- Regolamentazione e cambiamento organizzativo nella governance delle cooperative agro-alimentari
- Mercati verticali e gerarchie cooperative
- La resilienza della forma cooperativa
- Governance delle alleanze e cooperative

Cooperazione territoriale e sviluppo locale

- Strutture e meccanismi di governance nelle aree rurali
- Smart land e smart agriculture
- Governance delle aree rurali e urbane
- Governance delle aree interne e costiere
- Territori e comunità locali sostenibili
- Agricoltura sociale e inclusione
- Progettazione integrata di filiere e territori

Politiche per la cooperazione nella filiera alimentare

- Politiche e strumenti per lo sviluppo della filiera alimentare
- Reti europee, ricerca e innovazione
- Politiche per l'innovazione
- Commercio internazionale, sicurezza alimentare e sviluppo
- Politiche per la qualità e per la sicurezza alimentare
- Economia circolare e agricoltura verde
- Efficienza della distribuzione e spreco alimentare

La Conferenza, articolata in quattro giorni, è stata divisa in due sessioni plenarie nel corso della quali sono state presentate le seguenti relazioni:

- **Cooperative business model for the new agriculture** (Prof. Kostas Karantininis, Swedish University of Agricultural Sciences);
- **Vertical coordination in food supply chains: challenges and perspectives** (Prof. Alessandro Banterle, Università di Milano);
- **Consumers and modern food chains: preferences, evolution and new research questions** (Prof. Teresa del Giudice, Università di Napoli "Federico II");

- **Decision rights, Agro-industry organization and Cooperation (Prof.** Gaetano Martino, Università di Perugia);
- **Cooperation and economic organisation of agriculture in the CAP** (Prof. Alessandro Pacciani, Accademia dei Georgofili, Presidente del Centro di Studio sull'Organizzazione Economica dell'Agricoltura e sullo Sviluppo Rurale);
- **Granoro Dedicato: 100% Apulian supply chain pasta** (Marina Mastromauro, CEO Pastificio Attilio Mastromauro GRANORO Srl);
- **Features and performances of Italian food industry in the recent critical period** (Luigi Pelliccia, Federalimentare, Direttore dell'Ufficio Studi, Mercato).

A tali sessioni, hanno fatto seguito le sessioni parallele:

- social farming and social inclusion;
- rural development;
- statistical method and applications for agri-food sector;
- corporate social responsibility and agricultural work;
- food waste;
- circular economy;
- firm strategies and competitiveness;
- consumer behaviour and food systems;
- environmental and economic sustainability;
- territorial cooperation and food production;
- trend and policies in the food supply chain;
- research and innovation;
- territorial coordination;
- cooperation and governance;
- sustainability and animal welfare;
- cooperation and strategies;
- food supply chain;
- food innovation and consumers' acceptance.

Il primo giorno, inoltre, si è tenuto un evento pre-congressuale dal titolo "Circular economy and innovation of the agricultural sector", mentre l'ultimo giorno si è svolto lo study meeting "Cooperation between University and Public Administration for the development of the agro-food sector", presso la Fiera del Levante di Bari.

Il presente volume raccoglie gli abstract di una selezione dei numerosi contributi presentati durante la Conferenza, sia nelle sessioni plenarie che nelle sessioni parallele.

Uno dei più grandi chef italiani, Massimo Bottura, sostiene che: "la conoscenza genera coscienza e questa, a sua volta, responsabilità".

Ci auguriamo, perciò, che il seme gettato nella conferenza di Bisceglie possa fruttificare e vincere molte delle ottusità che, purtroppo, circolano nel nostro Paese, in Europa e nel mondo. Anche fra i cosiddetti studiosi ed addetti ai lavori della materia.

Affermava Tolstoj: "tutti pensano a cambiare l'umanità e nessuno pensa a cambiare sé stesso".

Vorrei augurarmi che, con i lavori di questo convegno, gli economisti agrari italiani possano avere contribuito a smentire il pessimismo del grande drammaturgo russo ed abbiano contribuito ad avviare una seria riflessione sulla necessità di rivedere alcuni paradigmi economici che, se non corretti in tempo, rischiano di compromettere il futuro dei giovani e dei territori più fragili del nostro Paese e di tante altre parti del mondo, con pesanti conseguenze in termini di: abbandono, disastri ambientali, squilibri demografici, migrazioni fuori controllo e tensioni sociali di ogni tipo.

Mali che, se bene valutati economicamente, in termini di spesa pubblica e di analisi "costi-benefici", sovrastano di gran lunga i risultati positivi che il corrente pensiero economico dominante e i policy maker europei e mondiali ritengono di ottenere continuando a portare avanti una logica di pseudo efficienza produttiva: basata sulla competizione esasperata fra settori economici e territori, sul saccheggio delle risorse ambientali e sullo sfruttamento dei più deboli.

Parafrasando Longanesi, si potrebbe sostenere che continueremmo ad affidarci a personaggi, studiosi e politici: "buoni a niente ma capaci di tutto".

La lettura dei lavori contenuti in questo volume, spero possa smentire queste mie pessimistiche previsioni ed avviare un nuovo trend di cooperazione a tutti i livelli che "contagi" tutti i predetti stakeholder politici ed economici coinvolti in questi processi.

In ultimo, occorre ricordare anche che questa Conferenza, svoltasi sotto il patrocinio dell'Università di Foggia, si è avvalsa del contributo della Regione Puglia, del patrocinio del Ministero delle Politiche Agricole Alimentari e Forestali, del Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria, della Provincia di Foggia, della Provincia di Lecce, della Città metropolitana di Bari, del Comune di Bisceglie, del Consorzio di Bonifica Terre d'Apulia, del GAL Ponte Lama e di tantissime aziende ed operatori delle filiere agroalimentari e del settore ittico, cui va la nostra riconoscenza e l'impegno a continuare su questa strada.

Francesco Contò
Presidente del Comitato di Programma

 ISBN 9788891786883

CHANGING THE DOMINANT STRATEGY OF THE CLIMATE PRISON: THE CASE OF RESILIENCE IMPROVEMENT IN THREE CLUSTERS WITHIN THE IRIS PROJECT

by *Federica Gasbarro*[*], *Fabio Iraldo*[**] and *Tiberio Daddi*[**]

1. Objectives of the paper

Although some studies have found that business adaptation to climate change is not as widespread as expected (Berkhout et al., 2006; Galbreath, 2012), some other show that adaptation to climate change is a process on how awareness and perceived vulnerability lead firms to decide how much effort to spend on (Pinkse and Gasbarro, 2016), and that business behavior in terms of business response to climate is not stable but can change over time (Gasbarro and Pinkse, 2016). This paper tries to illustrate under what conditions business change the dominant strategy to deal climate events, then when the payoffs change in implementing or not adaptation strategies which imply the improvement of community resilience.

2. Methodology

A multiple case studies research within the project Life IRIS (Improve Resilience of Industry Sector) provides empirical evidences to illustrate the process over time and the variables which trigger a change in the business behavior from a deferred to a reactive and anticipatory behavior towards the physical impacts of climate.

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 ISBN 9788891786883

3. Findings

The occurrence of climate events changed the company perception in terms of payoffs of a cooperation strategy vs a defection strategy. In such a case a mutual defection strategy left the companies vulnerable to climate events, as well as the absence of adaptation measures implemented by local public institutions, with consequences in terms of losses and financial cost of rebuilding after natural disasters. It is clear that the experience with previous climate events activated the risk management for this kind of event and changed the payoff for acting in regard to these specific climate events. However the willingness to take part in the IRIS project, then in the implementation of a more comprehensive climate risk assessment including several weather events related to climate change and the corresponding direct and indirect impacts, and the definition of a climate adaptation plan, seems to be also related to a particular attention of the companies to environmental problems, and in particular to climate change mitigation. This could be interpreted as a greater awareness of the climate change, which together with the perception of an higher vulnerability due to the losses related to experience with previous climate events triggered a change of behavior from a deferred to a reactive one to a specific climate events experiences and a pre-emptive behavior towards the not experienced climate events and possible related impacts. In addition, the threat of future environmental regulation represents a reason for payoff changing as well as the risk related to asset integrity, business continuity, financial balance, legal liability, infrastructures, staff health and safety and reputation.

4. Practical implications

The results allow identifying the main business risks and other variables, which changes the payoffs of the different strategies, which can be useful for business, social, policies actor when considering the implementation of the climate adaptation measures.

5. Limitations of the research

The study is based on a case study and would need a quantitative confirmation.

6. Originality of the paper

This is the first longitudinal study on business climate adaptation.

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DECISION RIGHTS, ORGANIZATIONAL CHOICES AND COOPERATION IN AGRIFOOD VALUE CHAINS

by *Gaetano Martino*[*]

1. Introduction

This brief note aims at illustrating some aspects of recent inquiries on the variety of the Agri-food value chains (AVC). The complexity of the organizational forms is a characteristic of the AVC which is being focused, beyond Agricultural Economics, by both Transaction Cost Economics and the Theory of organization. While an increasing literature is casting evidence on the role of analytical categories drawn from the theories mentioned, it is also becoming clear how innovated research approaches in Agricultural Economics are able to provide a meaningful AVC picture for managers, citizens and public authority.

The paragraph 2 underlines the necessity to consider property and decision rights. On this basis, the paragraph 3 delineates the theme of the organization variety of AVC and underline recent theoretical developments. The paragraph 4 illustrates some lines of research on AVC coherent with such theories and the paragraph 5 concludes.

2. What do complex arrangements share in Agri-food value chains?

Many complex organizations characterize AVC. Protected designation of origin (PDO) and similar arrangements allow farmers and other chain agents to provide typical products to the consumers. A network of relationships is requested in order to channel and manage flows of products and information

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 ISBN 9788891786883

in the PDO system (Raynaud et al., 2009). Likewise, the setting up and the management of producers organizations, cooperative firms, consortia and inter-branch arrangements also requires the participants identify and negotiate their duties and rights in order to make these arrangements effective to the economic purposes of all the agents engaged in the collective action related (Royer et al., 2015; Bjiman et al., 2013). The necessity and the economic convenience to establish relationships more complex than the pure spot market are also grounding the diffusion of written contracts and of chain arrangements like the chain contract supported by public policy intervention (Martino et al., 2012).

Comprehensive perspectives are being elaborated which identify property and decision rights as key categories and recognizes their role to understand the complexity of the organizational forms in AVC (Ménard, 2017, 2018; Grandori, 2015, 2017). Theory is then making clear that the allocation of those rights represents, at the same time, a critical decision in the management of the AVC relationships – common to the most of organization forms – and a central theoretical domain to understand AVC organization.

3. Co-ordination problems and organizational variety in Agri-Food value chains

Adopting a Transaction Cost Economics approach, Saccomandi (1998) identified an organization innovation model – the *cycle of organizational innovation* – capturing the adaptation process of the farm within the AVC relationships. According to Williamson (1985), such a perspective provided a view of the exchange which made the spot exchange just one of the possible governance structures. It also recognized the influence of the property rights allocation models (Grossman and Hart, 1986) on the modelling of the organizational adaptation. The theoretical basis of the analysis of the agricultural markets thus was innovated positing the transaction cost and property rights categories in a central analytical positions.

The focus on the organization of the Agro-industry exchange have highlighted a variety and a richness of governance modes (Klein, Mènard, 2004) observable in AVC, with clear trends characterized by the diffusion of hybrid modes (Mènard, Valceschini, 2005). Recent achievements of the Transaction Cost Economics provide an explanation of the variety of the organizational forms. It is the allocation of both property rights and decisions rights and their core characteristics which determines the variety of the organizational arrangements solving the coordination problem (Mènard, 2013, 2017).

The variety of the organizational forms is then classifiable according to these two dimensions (Mènard, 2013, pp. 1095 ff.) e.g. in terms of decentralizazion/centralization of decision and property rights (see Figure 1). The more strategic are the assets, the more contractual parties tend to centralize property and decision rights over them (Ménard, 2018, p. 150). Bounded rationality, opportunistic behaviour or unexpected, uncertain events may impede the parties to contract over key elements (*noncontractibilities*) which then require informal management mechanisms (Ménard, 2018).

Fig. 1 – Distribution of the governance modes

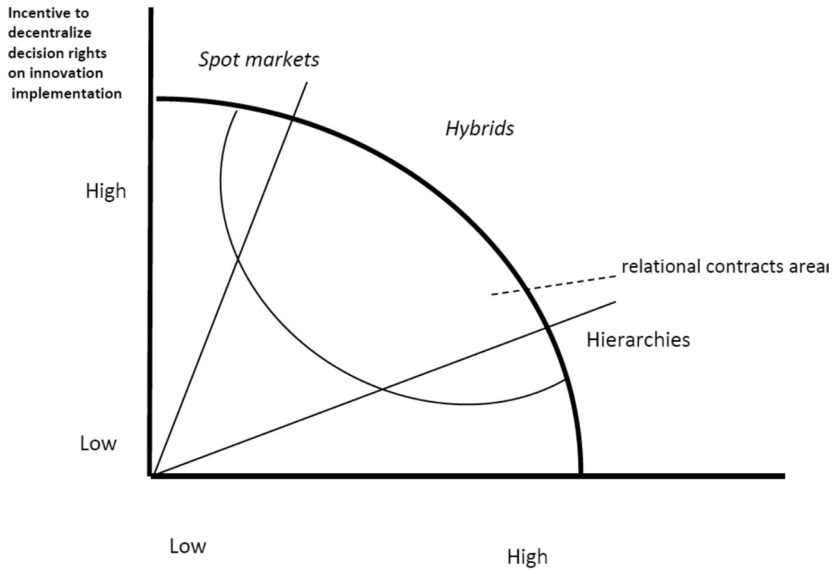

Figure 1 illustrates the distribution of the governance modes according to Ménard (2013, 2018). The real governance modes are usually collocated not on the optimal frontier, but in the "relational contract area" in which many *noncontractibilities* make the contract incomplete (Ménard, 2018).

The choice of the organizational arrangements is determined by the influence of asset specificity, uncertainty and frequency (Williamson, 1985). Although all the drivers, but especially asset specificity, channel the choice of the governance structures in AVC (Mènard, Valceschini 2005), the role of the uncertainty is becoming of increasing analytical importance (Mènard, 2013, pp. 1078 ff.). The figure 1 highlights the fact that multiple solution can be found for the problem of coordination which correspond to the capability of the parties to negotiate the allocation of both property and decision rights.

4. Lines of research

The progress of the theory opened avenues of research whose exploration is just started. Food quality and safety issues have especially addressed highlighting the connection between the quality and safety performance and the coordination of all the agents along the AVC (Ménard and Valeschini, 2005; Martino and Perugini, 2006; Hammoudi et al., 2009) highlighting the driving role of the allocation of decision rights among the transacting parties (Martino et al. 2018a). Further, a research stream is associating Agricultural Economics and Rural Sociology approaches to the connection between food production and consumption (Brunori et al., 2012; Martino et al., 2016). Finally, there is a growing literature in innovation studies, casting evidence on the role of governance structures in driving knowledge production and innovation implementation (Martino et al., 2018b; Pascucci et al., 2017; Karantininis et al., 2010).

5. Final remarks

This contribution aimed at illustrating the increasing analytical role of property and decision rights in explaining the complexity and the variety of AVC. There are increasing opportunities for research in AVC drawing from the frontiers of Economics of Governance and Theory of Organization. These possibilities appears promising for both achieving a more comprehensive understanding of the real AVC world and developing applied models of inquiry. While the coordination issues arise with the division of labour, cooperation problems concerns with the incentives faced by the agents (Ménard, 2005, p. 292). A critical line of research concerns then with cooperation and the necessity to investigate how AVC coordination solution may set up cooperation incentives.

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THE ROLE OF SOCIAL AGRICULTURE IN PERIURBAN AREAS: THE CASE OF BARI

by *Rinaldo Grittani*[*], *Alessandro Bonifazi*[**] and *Arturo Casieri*[*]

1. Introduction

The aim of the research has been to investigate and explore social agriculture (SA) (S. Senni, 2007; Di Iacovo F. et. al. 2014) in the periurban area of Bari, in order to understand whether and how far it is spreading, and whether there are the conditions for it to have a positive impact on economic development in these areas where social relations in the local communities are fragile.

In the study area, contemporary peri-urbanization needs to be framed at a wider scale than the municipal one (Grittani R. and A. Bonifazi, 2018), along the lines of the scenarios put forward by the Regional Landscape Plan (RLP), as well as of the ongoing institutional reforms. With regard to the RLP, the "City/Countryside Agreement" territorial project envisages a Multifunctional Agricultural Park for Regeneration (MAPR) as a strategy to foster environmental protection and local sustainable development around Bari. Meanwhile, the focus of spatial governance is slowly shifting towards strategic planning, following the establishment of a Metropolitan Authority – encompassing 41 municipalities, including some strongly rural areas.

The first part of the present work provides a general framework of the policies and planning tools that most affect this peri-urban context. In order to study SA, we referred to the MAPR area around the city of Bari, which includes some minor settlements in the first belt and some second belt municipalities to the north. However, our selection rule was quite flexible, because various social cooperatives and associations operate in more than one

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 ISBN 9788891786883

territorial context, even outside the study area. The second part of the work covers a specific investigation into the emergence of SA in these areas and of the role these organisations may play in local communities.

2. Materials and methods

The study was carried out using a series of semi-structured interviews and a focus group (FG).

The interviews involved SA operators, and managers of farms, social co-operatives and associations. Semi-structured interviews are characterised by open-ended questions, framed in a flexible prompt list of issues that ensure certain aspects are dealt with, and provide a common scheme of interpretation for different interviews (G. Jennings, 2001; VL. Zamunner, 1998). Four macro-issues were addressed in the interviews: business, market, policies and territory (Giarè F., F. Vanni, 2015), to which was added the crosscutting issue of networking between the interviewees.

In brief, the aim is to understand whether and how far these farmers and social workers feel that they belong to a wider and evident local development strategy or, on the contrary, to discover if they feel isolated and detached from the institutions and places where they operate.

The final FG involved Puglia's key actors in SA and was based on visual research (Margolis E. and L. Pauwels, 2011; G. Rose, 2016; Faccioli P. and G. Losacco, 2010, as it was accompanied by a "photo-essay" – a combination of 37 photographs and as many meaningful quotations taken from the interviews. Following Corrao (2000), we opted for a flexible scheme in four steps:

a) participants were given a brief presentation of the research and asked to glance at the photo-essay,
b) a first round of discussion revolved around what SA meant for those who practise it;
c) participants were then prompted to reflect on the relationships between SA and the places and communities where it takes place;
d) finally, the focus shifted to key resources and innovative practices to make SA sustainable over time.

3. Results

This preliminary study has pointed to SA in the peri-urban area of Bari being at an absolutely embryonic stage regarding the number of ventures and

their level of organisation. Most activities promoted in the municipality of Bari and in the first belt municipalities are connected with social cooperatives and associations, and only to a lesser extent to farming enterprises. However, moving further from Bari into the second belt municipalities, there are also activities derived from agriculture, mostly set up with funding provided by the measures in Axis 3 of Puglia's 2007-2013 Rural Development Programme (RDP).

In the case study of SA in Bari and in its peri-urban areas, although it involves a very small number of subjects, the importance and uniqueness of each experience is recognised, useful not only for the disadvantaged beneficiaries but also for the wider territorial context and the welfare of local communities. In the study area, the current dynamics make it possible to imagine development and potential, although these activities are still in their very early stages. Our study of these first experiences appears to confirm the role of SA in the creation of social capital that is useful for the development of sustainable economic activities (Casieri A. et al. 2009; Marotta G. and C. Nazzaro, 2012). In particular, the local community's involvement in SA activities has created relations based on trust and reciprocity, making it possible to reduce the transaction costs related to the use of agricultural areas. However, this is impeded by the cultural attitude of farmers, who have evident difficulties in adopting the SA viewpoint and perspectives.

The FG provided additional points for consideration and further understanding of the importance that social agriculture may have in peri-urban contexts and in the pursuit of landscape planning objectives.

One last consideration concerns some aspects of methodology. The innovative use of a "photo-essay" in connection with the FG should be considered useful because it brought researchers "closer" to the participants, who appreciated the effort of reading and interpreting the object of the study. The photographs and captions also aroused strong emotions and feelings, generating detailed explanations and some unexpected feelings.

The future developments of this research could be directed towards a more systematic examination of SA activity – either in the metropolitan area of Bari or under a comparative approach –, in order to look for further confirmation of the hypothesis that SA boosts economic development and community welfare in peri-urban areas.

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COLLABORATIVE APPROACHES IN RURAL TRANSITION: IMPLICATION FROM THE CASE OF SOCIAL FARMING

by *Roberta Moruzzo*[*], *Cristiano Rossignoli*[**] and *Francesco Di Iacovo*[**]

1. Collaboration in transition pathways

Collaboration and learning dynamics are currently at the centre of the debate due to the rising importance of multi-actors transition pathways to support the production of innovative solutions able to address complex challenges (Hermans et al., 2015; Klerkx et al., 2012).

Collaboration process, considered at the stake of the innovation (Barié et al., 2015), supports the development of new ideas (Burt, 2005; Powell and Grodal, 2005) and allows people to learn from each other to develop the capacity to take collective actions (Beers et al., 2014; Moschitz and Home, 2014).

During transition pathways, many actors converge in an arena where they share vision and strategies, define a common working agenda, build innovative pilot experiences and share knowledge and patterns (Murray et al., 2010; Voß and Bornemann, 2011; Di Iacovo et al., 2014).

The paper analyses the process of collaboration inside a specific social farming (SF) arena created in Valdera in 2005 (called Board of Social Farming – BSF). This arena, introduced and facilitated by the Valdera Union of Municipalities acts, was set up with the agreement of different stakeholders (Fig. 1).

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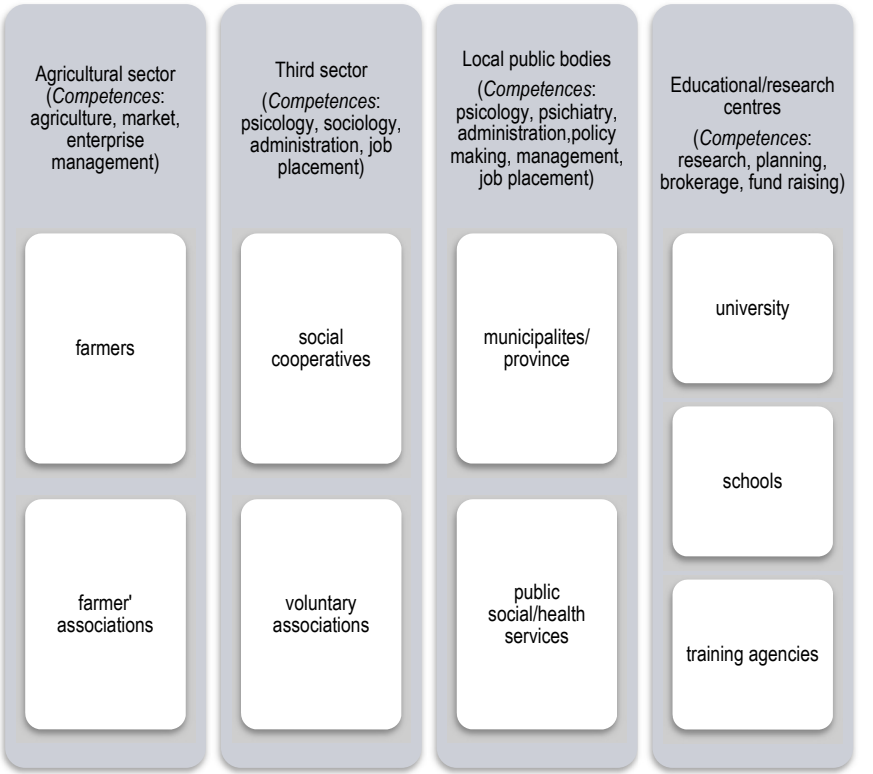
 ISBN 9788891786883

Fig. 1 – The actors involved in BSF



Source: our processing

Its aim was to encourage and to facilitate innovation in SF, by helping single initiatives and supporting the organization of a set of knowledge, rules and attitudes.

The actors involved in the BSF collaborated on a voluntary base, trying to face solution to challenges that they could not solve by alone. Each person within the arena was responsible for being a contact person between the BSF management and his/her own organization.

The paper examines how BSF functions but also highlights its limitations and tries to understand how collaboration and knowledge co-creation between different actors can support the process of transition.

2. Methodology

Starting to an article published in 2017 (Di Iacovo et al., 2017), the paper evaluates in details the process of collaboration in order to support the transferability of this experience in others territories. A multiple-choice model was:

- submitted, for approval, to some actors like Local Health authorities of Tuscany, involved in SF;
- tested in Valdera, through interviews with some participants of the BSF.

The model comprises five dimensions and 16 indicators that have to be evaluated simultaneously to provide a comprehensive view of the phenomenon (Table 1).

Tab. 1 – The multiple-choice model of collaboration

Dimension	Description	Indicators
1. Governance	Ways in which organizations work together to make joint decisions	Objective clarity, Transparency, Co-planning, Sharing
2. Administration	Ways in which organizations define roles and responsibilities, communication channels, and mechanisms to monitor each other's activities	Processes and activities, Working methods, Effectiveness
3. Norms of trust and reciprocity	Ways in which organizations, characterized by their own organizational boundaries and goals, collaborate to solve problems that they cannot solve alone	Rules of operation, Roles and responsibilities, Relationship between actors
4. Organizational autonomy	Ways in which organizations experience mutually beneficial interdependencies based either on differing interests/complementarities or on shared interests	Balancing, Multidisciplinary, Complementarity
5. Mutuality	Ways in which organizations guarantee reciprocity and trust	Balance, Comparison Capacity, Group Identity

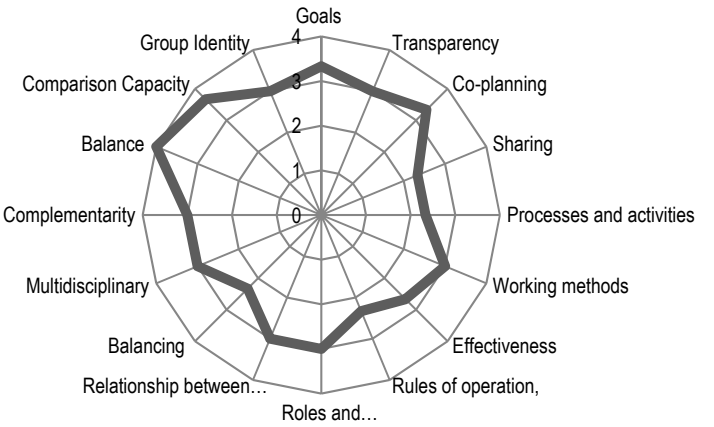
Source: Wood and Gray (1991), adapted by Thomson and Perry (2006)

The five dimensions are influenced by resources, financial constraints and policies (even if analyse these factors is beyond the scope of this paper). For each indicator, a continuum ranking from 1 to 4 was defined: 1 representing the minimum level of achievement of an indicator and 4 the maximum.

3. The BSF in Valdera

The questionnaire was considered useful but not easy to face, even if it was always completely fulfilled. A Kiviat graph, visualize the shortfalls between the current situation and optimal collaboration (Fig. 2).

Fig. 2 – The Kiviat graph map collaboration in BSF



Source: our processing

BSF was able to develop an active level of collaboration, especially in terms governance and mutuality. In details:

- BSF' collaboration is characterized by strong, clear and shared goals between the actors and good respect of personal expectations. BSF is considered as a place where actors might reinforce communication channels, transfer and share information and knowledge. BSF emerges as a transition arena for co-producing values, where power is balanced among participants, purposes are clear and shared, decisions are taken in a transparent way, and participants have an open approach and a problem-solving attitude;
- the mutuality dimension emerges as a consequence of an opportunity to meet, to run regular joint activities with the aim of increasing the co-design of innovative solutions. For this reason, the actors involved in the BSF started to experience mutually beneficial interdependencies based both on different interests/complementarities and/or on shared interests, working in a good climate of trust and mutual exchange.

In relation to the other dimensions, some aspects are more problematic:

- the actors need to develop more clear internal work rules and control mechanisms. The operating rules that clarify roles and responsibilities and the instruments to monitor each other's activities in relation to roles and responsibilities need to be improved;
- there is still not sufficient balance between the mode of operating and the goals; the actors need to balance personal interests and collective interests with the shared goals;
- the processes and the activities, for the formal recognition of SF initiatives, started inside the arena, need to be defining in a better way.

4. Discussion

Collaborative processes are at the fare front of innovative roles for agriculture. The BSF offers interesting insights from this point of view. Valdera case underlines that collaboration is pivotal in the social innovation processes and that it can take place when institutions are able to design and to manage the space for new interactions among not common actors, facilitating and managing their interaction and preventing from any possible instrumentalism and power game the expected outcomes. Subsidiarity among diverse actors facilitated the mobilization of local resources, in this case from agriculture to social services. The creation of the arena, able to foster innovation and create the space for further formalization, was crucial and can be applied to other fields of action.

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SOCIAL FARMING AND POLICIES, BETWEEN SOCIAL INNOVATION AND PATH DEPENDENCY

by *Francesco Di Iacovo*[*], *Roberta Moruzzo*[**] and *Cristiano Rossignoli*[**]

1. Social farming, social innovation and transition pathways

EU2020 strategy focus on social innovation (SI) to support society in facing economic-environmental-social challenges (Davies et al., 2012; Science for environment Policy, 2015; Bonifacio, 2014, Moulaert and Nussbaumer, 2005; Murray et al., 2010). SI in rural welfare can be brokered, co-designed, and installed by local communities alliances among actors to define alternative practices like social farming (SF). SF breeds sectors and competencies, mobilizing agricultural-rural resources in the organisation of services to answer to increasing societal demands (Di Iacovo, 2014). SF is differently growing in EU according with national welfare systems and cultures (Esping and Venzo, 1995). In Italy, SF is an experimental living lab (Edwards-Schachter et al., 2012) based on a deep subsidiarity among private-public actors (Vittadini, 2007), co-production of services, food and public/private values (Olstrom, 1996; Alford, 2002), civic economy (Bruni, 2012), ethical food consumers in the perspective of a welfare community. SF always starts from isolate local practices and arenas where actors progressively organise new knowledge, rules, models and a new policy domain (Di Iacovo, 2017).

Starting from the Italian case and the Tuscany region, where part of such a process started (Fig. 1), our paper would understand:

- SI in SF and the influence of path dependency;
- the effectiveness of rural policies in fostering SI in rural areas.

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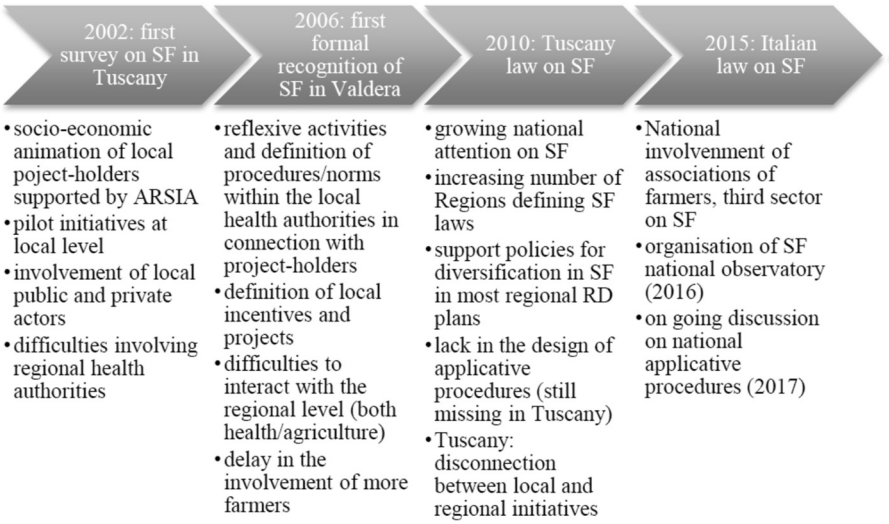
 ISBN 9788891786883

Fig. 1 – The timeline of social farming development in Tuscany/Italy.



Source: our proceedings

The methodology is based on a long run research-action process started in 2002 and still on going.

2. Social farming in Italy: frames, institutional levels and policy dimensions

Our work is based on the following three theoretical elements: frames, institutional level and policy dimensions.

Frames as term of reference or schemata of interpretation (Goffman, 1974) are able to orient visions, narratives and practices of the actors embedded in SF networks (Benford and Snow, 2000). In SF, diverse actors at different institutional levels might differently enter in the debate (Dessein et al., 2013; Hassink et al., 2012, 2016; Tulla et al., 2014). In italian SF three frames can been identified:

- a community based social farming (CBSF) based on a stronger collaboration among actors and a mix of state intervention, exchange and reciprocity beside market, blended competences and policies, community activation;
- SF as economic farm diversification (SFEFD) rooted in technical/political agricultural actors aiming at broadening the farms activities and

farms economic viability by providing innovative services in the social/health field still based on direct payments from users or public funds;
- SF as a social tool (SFST) rooted in the social/health sector introducing agricultural activities/processes in the toolset used by social/health providers under the public funds reward.

The SF debate takes place at three institutional levels:
- local: SF practices are activated in connection with local health authorities and municipalities, which remain responsible in services provision. The reduction of social public budget pushes actors to converge and collaborate in new arenas, to broker knowledge and to set a CBSF;
- regional: influence the definition of criteria, rural and social/health policies. Local project-holders are always un-recognized, public servants and representatives of diverse actors take part to close debates where they sponsor, conflict and adapt existing sectorial frames to SF, giving space to SFEFD and SFST frames;
- national: define SF standards (law, procedures), within the interest representation of the main categories informed by the sectorial adapted frames (SFEFD and SFST).

The political environment could be organised into three dimensions (Voß and Bornemann, 2011): policy, polity and politics. Policy, linked to the framing activity regards the discussion around problems and solutions. Polity faces the definition of rules and structure for political discussion (like arenas organisation and internal rules). Politics regards the struggle for dominance/collaboration in the arena. Each dimension can be declined into three levels: focal interaction, policy domain and political system (Tab. 1). How different actors take position on the three dimensions/levels affect the process of innovation in the articulation with the framing phases and the diverse institutional levels.

Tab. 1 – Political dimensions and level

Levels	Political dimensions		
	Policy	***Polity***	***Politics***
focal interaction	main focus is on the organisation of problems and goals of the local interaction and governance	rules and procedures insight the governance process	struggle for dominance/cooperation among participants of a governance process
policy domain	problem definitions and political approaches that might be dominant is considered	institutional arrangements within it	struggle of organised political actors for *supporting*/dominate with their positions within a policy domain
political system	organisation of discourses and political values and belief are the main focus.	constitutional rules and political culture	struggle for affirmation/dominance among broad social groups, sectors classes or regions

Source: our processing (adaptation from VoB and Bornemann, 2011)

3. Results and conclusions

From the SF case emerges the difficulty to use rationalistic approaches in SI and transition in the Italian situation. The CBSF frame introduces many innovative aspects able to radically change the provision of social services in rural areas. It reinforces subsidiarity and co-production of public and private values and a diverse attitude of farmers in creating values. In front of such efforts the counter-organisation of SFEFD/SFST frames embedded in existing State/market principle and paths managed to cover most of the attention in the regional/national level, slowing down SI in SF and reducing the possible outcomes.

Today it seems that no tools is really supporting the voluntary activity of actors engaged in SI processes. No space was open to establish a PEI on SF at regional level. RD-measures for agricultural diversification were rooted in the SFEFD frame (support to investment for new granted activities) and didn't fit the CBSF. Also the use of ESF for SFST is installing new competition within social sector more than supporting local transition processes.

From the SF case three main points can be addressed:

- there is a new demand to recognize innovation, giving support with transparency and equity to innovative less represented actors;
- SI is facilitated by the active role of third public actors not engaged with specific interests. The local support, perhaps, is not effective without vertical connection with other institutional levels. Radical innovations redistribute resources and power, without any mediation the regime actors don't have any interest to reorganise themselves;

- in Italy, crisis in the public system and the turn-over stop of public officers has reduced the technical comprehension of challenges, solutions, working methods and outcomes with negative impact on innovation.

SI is becoming part of change of our contemporary society in front of emerging challenges, also in agriculture and rural-areas. Being a transformative concept it's demanding in terms of re-alignment/collaboration of many actors around new frames based on concept and principle able to mobilise resources in unexpected way.

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SOCIAL FARMING AND INCLUSION IN EU ESI FUNDS PROGRAMMING

by *Carmela De Vivo*[*], *Michela Ascani*[**] and *Marco Gaito*[**]

1. Introduction

20 millions of people in Europe are at risk of poverty or social exclusion. In this context, mostly related to economic crisis, Europe 2020 Strategy identifies fighting against poverty and marginalization as one of the 5 objectives to be pursued, with an attention to active inclusion of the most vulnerable groups in society and in the labour market, overcoming of discriminations and integration of people with disabilities, ethnical minorities, immigrants. We start from a definition of social farming (SF) as innovative opportunity of service delivery, able to address the need of services coming from individuals and communities, and of diversification of agricultural activity, enabling farmers to expand their role in rural communities and society and to generate a potential source of income (O'Connor et al., 2010). From a theoretical point of view, the social function recognized to agriculture is closely related to its multifunctional role (J. Dessein et al., 2013; M. Lanfranchi et al., 2015; A. Scuderi et al., 2014; I. Zasada, 2011; F. Di Iacovo, D. O'Connor, 2009): social farming may further broaden, diversify and add value to multifunctional agriculture, by connecting farming with welfare services and creating new markets for farmers.

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 ISBN 9788891786883

2. Materials and methods

We assume that the adoption at EU level of a cross-cutting approach to social inclusion policies represents a policy innovation and generates social innovation. Coordination of different policies relevant to social farming at EU, national and regional level has been recently recommended by the European Economic and Social Committee (EESC, 2013).

SF is a complex body of practices integrating various activities into farming and promoting, among other goals, social inclusion. It uses agricultural farms as base for promoting human mental and physical health, as well as quality of life, for a variety of target groups (M. Lanfranchi et al., 2015; A. Scuderi et al., 2014; A. M. Steigen et al., 2016). It is based on cooperation among sectors, actors and different areas and, for these characteristics, it represents an innovative, multi-actor and multidisciplinary approach to different levels of problems in EU territories; it can contribute to the definition and implementation of new pathways of change in rural and peri-urban areas, being an alternative way for delivering innovative and effective social services, with effects on individuals, farmers, local communities (M. Lanfranchi et al., 2015). In terms of inclusive effects, in addition to "direct" inclusion of service users, it becomes an element of inclusive development for the whole society, also due the use of a community based approach and to the extensive use of networking (F. Di Iacovo, D. O'Connor, 2009).

In the last decade in Italy SF registered an increase in number of operators and a growing interest also at legislative level. EAFRD, already addressing SF in 2007-2013 as instrument of diversification of farms with social activities, in the current programming period devotes to the theme of social inclusion a more specific attention, setting social inclusion and reduction of poverty as one of the 6 Priorities to be pursued in 2014-2020. This priority has been translated in Rural Development Programmes (RDPs) into specific measures and dedicated funding and implementing modalities.

The paper aims at outlining, through a desk analysis, the evolutionary framework of EU policies in the field of social inclusion and at analyzing both the novelties introduced by 2014-2020 policy, with reference to European Structural and Investment (ESI) Funds, and their implementation in Italian programming documents. After outlining the policy context of social inclusion in the EU since the 1990s and in particular within 2014-2020 overall cohesion policy and single Funds (ESF, ERDF, EAFRD), the Partnership Agreement for Italy is analyzed, acknowledging the link between economic and social policies and defining thematic Objective 9 "Promoting social inclusion, fighting poverty and discrimination". The Agreement identifies so-

me interesting actions, in order to promote social inclusion, also indicating the required instruments, in a logic of integration among ESI Funds.

In order to evaluate whether SF represents an opportunity to affirm a sustainable and innovative model of agriculture and of participated welfare, we then examine two Italian cases: the 2014-2020 Italian Rural Development Programmes (RDPs) and a LAG experience, in the framework of 2007-2013 Leader +. The first case is based on the results of an analysis carried out on the 21 Italian RDPs in 2016 (M. Ascani, C. De Vivo, 2016), showing growing and specific attention to the theme by EU rural development policy and Italian managing authorities, with the provision in 20 out of 21 Regions of interventions financing SF, coherently with the cohesion policy framework. SF is described as: opportunity of social inclusion, innovation and instrument of social and economic development in rural areas, creation of networks between farmers and social cooperation actors, opportunity for farmers to deliver complementary services related to agriculture, opportunity of income and employment. Summarizing, it is perceived as social innovation that can enable agriculture to become instrument of welfare for the benefit of Italian rural communities.

Finally, the Leader experience in Sulcis, Sardegna, represents a 2007-2013 best practice in the integration of EU Funds, showing as social inclusion generated by SF expands its effects both in rural and peri-urban areas interested by SF initiatives and in society as a whole (B. Bock, 2016; M. García-Llorente et al., 2016).

3. Results

We conclude acknowledging that the theme of social inclusion has gained a role in the European political and scientific debate and that this attention has coherently been translated into the EU regulatory framework. SF, incorporated into EU Regulations, Partnership Agreement and national and regional programmes, represents one of the instruments contributing to active inclusion; it is also a "social innovation laboratory", where network approach and connection among Funds allow the implementation of complex interventions, requiring synergies among policies, actors and territories. The analysis carried out on the policy and regulatory framework shows the opportunities for social inclusion provided by ESI Funds. Nevertheless, a substantial delay in the implementation of programmes and the lack of a multi-fund approach have to be pointed out and need to be overcome in order to develop further research.

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THE SOCIO AND WORKING INCLUSION OF DISADVANTAGED PEOPLE IN AGRICULTURE: THE "MODEL" OF SOCIAL FARMING IN ITALY

by *Francesca Giarè*[*], *Patrizia Borsotto*[**] and *Ilaria Signoriello*[***]

1. Introduction

During the last 10 years in Italy alternative forms of response to the rising needs of the population have developed – these are often defined with the term "community welfare" and they are also the result of the outbreak of the economic crisis and the consequent increase of inequalities, new poverty and the crisis of the Welfare System.

Of particular interest are all those practices carried out by agricultural enterprises and cooperatives in collaboration with public services and third sector actors "In which a social aim is intentionally pursued as the outcome of an agricultural practice" (Senni, 2010).

In the recent years this set of practice has come to the attention of an increasing range of rural stakeholders, researcher, social workers, Public Institutions. Numerous examples of these practice can be found around Italy all gathered under the definition of "Social Farming". The growing understanding of the potential role of agricultural and rural resources for enhancing the social, physical, mental and economic well-being led the Italian Parliament to pass the Law 141/2015 providing, after a period of proliferation of regional law, a framework of principles and procedures for recognizing social farming practices.

The recent 141/2015 law describes 4 typologies of social farming:

- Social and working inclusion of people belonging to weak bands acknowledged by local and regional welfare bodies and socio-occupa-

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 ISBN 9788891786883

tional inclusion of disadvantaged and disable people, as defined by the current legislation;
- Social, socio-sanitary, rehabilitative, therapeutic, training and educational services for families, seniors, disadvantaged and disable people;
- Social activities to support local communities, which make use of material and immaterial agricultural resources to provide services useful for everyday life, as well as promote, accompany and achieve actions of social and occupational inclusion, recreation and education;
- Educational activities aimed at disadvantaged people.

The "Italian Model" of SF seems to be developed and centered mainly on the first type of activity aimed at the social and working inclusion of disadvantaged people (Dessein, Bock, de Krom, 2013; Di Iacovo e O'Connor, 2009) and also confirmed by the recent National survey conducted by CREA-PB (CREA-PB, RRN, 2018).

2. Materials and methods

The National survey carried out within the activities of the National Rural Network by CREA-PB in collaboration with INAAP is refered to the period 2016-2017; the survey shows how over 70% of the respondents affirmed to carry out activities aiming at the socio-occupational inclusion of people belonging to weak bands. Through the method CAWI around 400 operators have been reached. The data collected, according to a descriptive approach, were subjected to a multivariate analysis with the aim of characterizing the Italian social farming.

The paper will present the main results of the National survey by focusing on the principal aspect of this "model", the different actors, the networks of relationships within which the initiatives are implemented, the agreements with heterogeneous actors. These practices will be analyzed in the light of the most recent studies on the concepts of social inclusion and socio-working inclusion (Fioritti et al, 2014).

In order to carry out an in-depth analysis of the social and working inclusion processes, the results of a qualitative analysis, still in progress, involving the different social farming stakeholders will be presented. The case study, selected on the basis of the results of the multivariate analysis on National Survey and of some criteria of innovation and geographical representativeness to analyze aims and manner of socio-working inclusion, are:

- Social Cooperative "I Berici" (Vicenza), that collaborates whit many local enterprises in educational and socio-working path;

- Social Cooperative Resistenza (Naples), that cultivates lands confiscated from the mafia;
- The Viva Io shelter Laboratories, run by social cooperatives Agricoltura Capodarco;
- Montepacini Social farming (Fermo), specialized in work-to-school alternation especially for mental disable students.

3. Results

The cases selected presents characteristics and expertise appropriate to deep the theme of the methods of social and labor inclusion developed over many years of activity and through the collaboration with the local social-health services. The qualitative analysis aim is in fact to give the over whole analysis of the possible processes of social and working inclusion in agriculture activities, highlighting the strengths and weakness in the framework of the current welfare system and rural development.

The investigation has been conducted using semi structured interview (Guala, 2003; Bichi 2007).

The paper, according to the national survey, shows that social farming presents a wide range of opportunities which are differentially represented in particular agrarian spaces, in order to connect different sector and different actors; it may, consequently, generate benefits for all sectors and all actors involved, in terms of well-being, economic development and inclusion. The results, in a specific area, is the development of the whole local system.

The qualitative analysis demonstrates that is important analyze inclusion determinants to identify correctively SF good practices, defined as experiences and pathway that allow to include in real socio-economic contexts, related to: activities (guidance, training, increasing complexity and responsibilities, etc.), involvement dimension (mixed target, integration of different vulnerable target group in the same inclusion process, work contract, etc.), Context dimension (positive working relationship inside and outside farm, sensitization and communication towards local community, etc.). These are elements on which the specific literature on SF is lacking and which must be further explored, with a view to studying SF as a device for the growth of territories and local communities.

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MODELS OF MANAGEMENT AND ORGANIZATION OF FARMS IN SOCIAL AGRICULTURE

by *Nicola Faccilongo*[*], *Piermichele La Sala*[*], *Gianluca Gariuolo*[**] and *Leonardo Di Gioia*[***]

1. Introduction

The Social and Educational Farms are the most innovative expression of the multifunctionality agriculture, which gives to the company the opportunity to diversify through the development of complementary activities related to the production of food goods.

The farm produces not only food, but it also provides services to citizens such as agritourism, direct sales and the preservation of the environment and the territory (Senni, 2007).

There is therefore a strong link between the third sector and social agriculture, which seeks to initiate processes of sharing economic, environmental and social sustainability objectives and affinities of motivation. Social agriculture can therefore be qualified as a social and economic innovation practice for rural areas and agro-food companies. This innovation shows how close to offering new services in response to poor or poorly satisfied needs elsewhere also offers innovative ways of building the services themselves (Giarè, Macrì 2012).

In fact, over time, the value of this new sector, in the Apulian agriculture, is obtaining a great importance both from the point of view of the increase of value for the farmer and for the increase of support for social policies in marginal areas (Macrì, 2011).

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However, there are still no experiences of social agriculture assessment that take into account the multiple factors in the field and deal with the topic from an articulated and multidisciplinary point of view, with the exception of Hassink's studies (Hassink, 2006, 2008) which address both the economic aspects Both the effects on the beneficiaries.

This work aims to provide a first contribution to the identification of a possible methodology for identifying and formalizing some models of management of social farming initiatives and providing some indication of possible economic and managerial assessments.

2. Materials and methods

The starting point for identifying models and methods of management and evaluation of social farming activities is certainly a review and a collection of public and private action types in the creation of economic and social value in this economics area.

In a territorial context in which firms and decision makers are subject to stress and to the needs of an evolving society, productive realities have undergone highly local and territorialized development and adaptation processes (Krishnamurthy V. et al., 2013). To date, there are no common references and standards to be aligned both in the construction of services and in their delivery. In this perspective, thinking about adapting how to create and distribute values implies a deep transition process that can involve and change the way a large audience of public and private actors works (Orchard L. et al., 2016).

According to the scenario and the objective outlined in the introduction, a structured literature review following the methodology used by Dixon-Woods et al. (2004), Velten et al. (2015), Tranfield et al. (2003), in order to:

- identify the actions adopted by social agriculture;
- identify the most widely used therapies;
- evaluate how different conceptions about social farming, are combined in a scientific debate.

It is expected to obtain a literature database that can be used to create a framework with the actions adopted by the Social Agriculture to study the performance of care processes of the care farm. Ultimately, thanks to this framework, it will be possible to create a measurement system that can monitor how different conceptions about social farming, are combined in a scientific debate. Moreover, with this standardized system, it will be possible to classify all the best practices identified in order to develop the best cooperation strategies

between European farms. In the future, a similar framework can be applied to nursing centers such as hospitals and other facilities.

Within this broader sample, the most significant initiatives will be identified on the basis of the following criteria:

- Wealth and relevance of information
- Homogeneity within the sample being investigated.

To increase the level of validity of the research (Riege, 2003), we will analyze the cases using a grid to structure the information homogeneously (internal validity), (Miles and Huberman, 1994).

Each case will be processed by structuring the information into the following categories and categories of analysis:

- Offering,
- Eco-System
- Governance Model
- Value Chain,
- Skills,
- Partner Network,
- Market (Customers and Territorial Distribution)
- Economic Aspects.

Based on the components of the social business model framework proposed by Yunus, Moingeon and Lehmann-Ortega (2009) for each case, benefits and risks will be identified in order to identify the social profit equation and the economic profit equation.

In order to increase the level of validity of the analysis, the results will be analyzed and compared with the existing literature identified in the preliminary phase (Yin, 2003).

3. Results

Based on the review of the literature carried out up to this time and the preliminary results of the data collection will probably be identified five main business models linked to the 5 main sectors of the social agriculture:

- Welfare;
- Therapeutics;
- Well-being
- physiotherapy;
- Teaching.

Based on the validated business models, it will be possible to identify the needs of Social Agriculture, its limits the economic and social potential all

of that from the point of view of the farmer's income and his contribution to the development of rural areas. These business-specific results will be accompanied by the identification of technical-technical suggestions on the integration and improvement of PSR intervention in the specific sector of social agriculture. For these reasons it is believed that the process of identifying and evaluating methodologies for managing social farming initiatives and their integration into regional assistance policies will certainly have an impact on theories of welfare reform and the evolution of agriculture (Wiskerke and Van der Ploeg, 2004; Van den Bergh and Bruinsma, 2008 Loorbach and Rotmans, 2010). Such effects and evolutions certainly will not find a specific solution in the adoption of new technologies, rather than policies and interventions of socio-technical environment reform, market references, solutions, policies and cultural meanings in which, both Problems as the same solutions are defined (Geels, 2010, Geels, 2004).

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THE SOLIDARITY ECONOMY IN LOCAL GOVERNANCE SYSTEMS

by *Lucia Piani*[*] and *Valentina Guerra*[**]

1. Introduction

The economic and environmental crisis, with the related shocks that have hit in particular the Western world, have led to a series of reflections on the globalised economic model and its famous effects on both a social and environmental level.

In this context researchers from different fields of studies have analysed the recovery of the local economy (A. Magnaghi, 2000). Such a recovery require a rethink of the boundaries of a system centred around the link between local communities and their territory which lead back the economic relationships of production and consumption as much as social ones.

However the schools of thought that have developed around models of alternative development are very diverse: from Degrowth (Latouche, 2008; Alier et al., 2012; Kallis, 2011), to Sharing Economy (Botsman and Rogers, 2010), Peer to Peer economy, Health economics (Eisler, 2015), Solidarity Economy (Laville, 2003; Biolghini, 2007), Economy for Common Good (Felber, 2012) Bioregionalism (Berg, 1978).

In this study we focus on the Solidarity Economy which can be defined as an economic activity governed by the principle of reciprocity and initiated by civil actors (Laville, 2003), and Bioregionalism which refers to the organization of human society taking into account the ecological capacity of a natural region (Berg and Dasmann, 1977),

The aim of this work is to explore the governance of local systems, using a case study (Mance, 2003) that examines the preliminary stages of the

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 ISBN 9788891786883

investigation of a process started by the local governments of four towns in Friuli Venezia Giulia (FVG), in the north east of Italy, to establish a Solidarity Economy District. A Solidarity Economy District (RES, 2007) can be seen as a laboratory of civic, economic and social experimentation, in which it is possible to develop local resources and generate wealth in a condition of ecological and social sustainability.

Recently the Solidarity Economy has been supported by a new law in the FVG region (L.R. 4/2017 – Valorization and promotion of Solidarity Economy) which define it as a socio-economic and cultural model centered on local communities.

2. Methodology

The experience of establishing a Solidarity Economy District in an area of Friuli-Venezia Giulia region has been analysed and evaluated by applying an approach inspired by the Action Research (A-R) method (Barbiér, 2007, Elliott et al., 1993). This research is being carried out through the direct involvement of the researcher who follows all the phases to evaluate and change the development process (Montali, 2008). It focuses on the first step of the local devolpment which has started promoting a flour and bread chain.

The process A-R has been developed in different phases following the directions of the research and action spiral (Barbiér, 2007), a model that recalls the Deming's Cycle (plan, do, act, check). In this case the process (Problem) began with a phase in which local administrators, together with researchers, reflected on the local economic system. To do this a local group (Plan) was created which consisted of local administrators and technicians, who aimed to experiment with new ways of territory governance and social innovation, with particular regard to the agricultural system (Brunori et al., 2009, Rossi et al., 2012). The first action phase (Do) consisted in sharing the proposal with the citizens through introductory meetings and conferences. Then, direct survey techniques were employed (Niero, 1995) to evaluate the citizens' interest in the proposal. (Check).

Finally, the last phase of action (Act) assessed, through an interview with the mayors, the project's success in the community.

3. Results and discussion

A "Bread and flour supply chain" was activated in 2015. The area involved has about 13.000 inhabitants with a population density of 95 people/km^2.

To involve the citizens and local associations, three meetings have been held and to evaluate the interest in the initiative, people at the meetings were given a survey to fill in.

The most interesting aspects that have emerged were the following:

- the innovative political management system;
- the creation and reconstruction of social ties in the community;
- the shortening of the production chain through short and local supply chains;
- the ecological nature of the project;
- the opportunity to actively participate in the project's management, especially when defining the prices.

The main doubts about the success of the project were:

- the bureaucratic aspects that could be an obstacle;
- raising the awareness of the local community;
- profitability, especially linked to organic farming, of which few producers had any experience;
- the need to establish the rules of the territorial agreement.

In the first year of trial 13 farms joined the flour supply chain, covering an area of 23 ha and producing about 740 quintals of wheat. Additionally a mill, a storage center, 10 bakeries and 23 among small shops, agritourisms and restaurant owners adhered to the project.

Since the promoters of the initiative were the mayors of the 4 municipalities, in January 2016 a semi-structured interview was held with them to evaluate the process.

The following considerations emerged from the interviews:

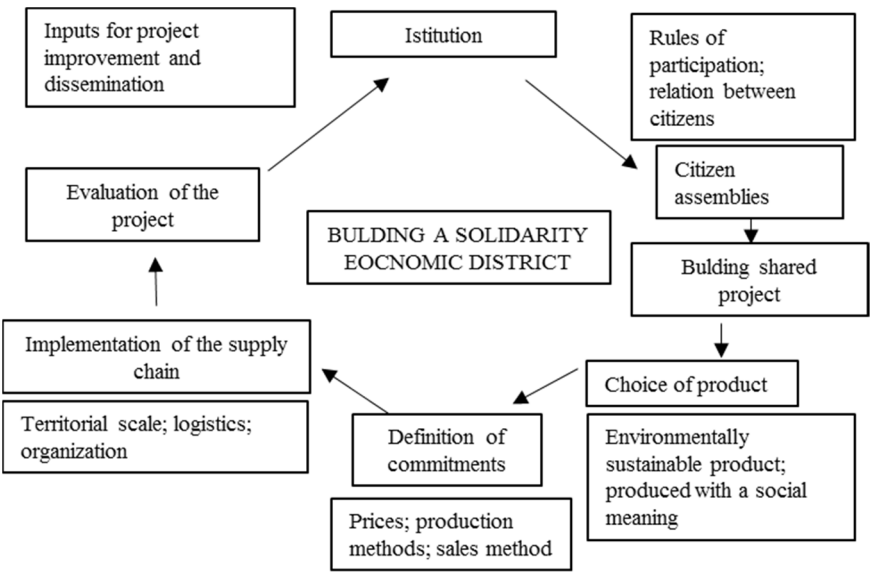
- degree of awareness of the project: it is estimated that the project is known and appreciated by 10-25% of the population; but it is assumed that it will active a greater publicity through the diffusion of the products;
- creation of the Solidarity Economy District: it is considered an important goal for all the mayors, the territorial size could ensure a fair relationship between sustainable farming and the population's food sovereignty. The mayors agree in thinking of the District as an association of citizens, inside which they exercise forms of direct democracy

to promote economic policies directed at restoring the territory of Medio Friuli and its food sovereignty;
- role of the institutions in the project: the mayors believe that their intervention is necessary until the project is definitively operational.

4. Conclusion

Our case study focuses on an experience conducted in four municipalities, which established a close cooperation to develop a new agricultural and food model for their own territory with the aim at creating a Solidarity Economy District. The different stages of the project are summarised in figure one.

Fig. 1 – The step of the project



Source: our processing

Furthermore, they established, in December 2016, a "community" cooperative to lead the organization and deal with the logistical side of the project. This cooperative of producers working side by side with citizens, actively involved thanks to their representatives on the board of directors, has the task of managing the administrative and coordination issues of the supply chain.

At present, research continues to follow evolving process in the establishment of the Economic Solidarity District.

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THE ROLE OF AGRITOURISM AS A TOOL TO IMPROVE AGRICULTURE ACTIVITY AND DRIVER TOWARD THE SMART COMMUNITIES AND SMART TERRITORIES

by *Adriano Ciani*[*] and *Donatello Caruso*[**]

1. Objective of the paper

The aim of this paper, to investigate the role of agritourism with a tool to promoting a Smart agriculture toward the Smart Territories and Smart Communities. The agriculture holdings are locally dependent and form business coalitions to stimulate investment in their local economy, they attempt to harness the powers of local government, which are susceptible as a result of their own local dependence (Kevin R. et al., 2010). The process of diversification on agricultural activities is synonymous with a variety of activities and services that surround the farm. Among the agritourism business and with them the success of rural tourism, they become the driving force for the development and creation of new economies associated with the production and sale of typical products, with the ability to attract new tourist flows. So far, the farm is subject to a reorganization of the company due to the multiplicity of activities, ranging from the production of finished products (fresh and packaged food), to the marketing of products through the short supply chain and hospitality services. The organization of recreational services. The organization of these new activities, that are assimilated to business company, require new skills and new figures to be involved in the agricultural holding, including the introduction into our legislation of the figure of the professional agricultural entrepreneur, which are the basis of Rural development processes adopted by the European Union through the Common Agricultural Policy (CAP). The requirement for the agricultural holdings to adapt rural structures in line with legal standards and the creation of new jobs are

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 ISBN 9788891786883

among the goals from the Rural Development Policy through public aid. So, the strategies adopted by the EU for Rural Development, we are attend a genuine process of transforming farms in an innovative and sustainable way, capable of responding to new consumer goals.

2. Methodology

The methodology of the work is based on quantitative information for the analysis from farms for a part of the concepts and model of governance of the territories it is a logical verification of the updating references on the thematic of agritourism and the role of the Community-Led Local Development (CLLD). By using some statistical tools, the important economic parameters defining the differences between in to agritourism activities, therefore we have derived the data elements for discussion and analysis.

3. Results and discussion

In the light of the evaluations of the preceding paragraphs strongly emerges the possibility for future years to capture the new paradigms and new approaches that the territory has to offer. When we take into account of inspiring the activity of Agritourism to the new paradigms and the new approaches and we try to catch new opportunities that the territory can us assure, it's possible to create very innovative results in each local area. This could activate a vital process of transformation of the rural areas which we call the Green Virtuous Territorial Circuit. Sustainable development is the model that is emerging with new paradigms: the demand for an innovative approach for a sustainable vital and sustainable farm. In the light of its specific characteristics the organization of the modern Local Food Chain, linked in a complementary and related to agricultural activity, is the form that must be privileged because the movement of niche tourism in rural areas is mainly based on the supply of foods and the ecosystem services. The farmers are those that guarantee the continuity of supply of these services. Therefore the agritourism is the expression of the pluriactivity of the agricultural firm, multifunctionality refer the fact that an economic activity may have multiple outputs and, by virtue of this, may contribute to several societal objectives at once OECD (2005). For every traditional agricultural product matches today a wide range of products, variants typological qualitative and related services required for agriculture. The agritourism should therefore not be confused

with the term rural tourism, related to it but substantially different, such as "multifunctionality activity by farms". The difference between agritourism and rural tourism represents an issue of general interest. More specifically, an interesting scientific and political debate nowadays exists in relation to the observation that the agritourism is an activity managed directly by farmers and can be managed only by farmers, but this is not always true and sometimes they are managed by operators outside the agricultural sector. This showed that nowadays the agritourism represent a challenge and an opportunity to increase net income and in particularly cash-flow level in the firms. The advantages of agritourism can also be measured by other indicators, it contributes to the more effective utilization and harmonized sustainable utilization of the natural resources (ecosystem services). This vision placed the Agritourism as a drive toward the Smart Communities and Smart Territories.

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THE LEADER METHOD IN BASILICATA: ADDED VALUE AND INNOVATIVE CONTRIBUTION

by *M. Assunta D'Oronzio*[*] and *Domenica Ricciardi*[**]

1. Introduction

The LEADER approach was introduced as a Community Initiative (IC) more than 20 years ago in European rural areas and focused on local development issues. It is represented in the Fourth Axis of the 2007/2013 Rural Development Program (RDP), and broadly widened the potential of the method and highlighted some critical issues due to overlapping between "ordinary" RDP measures and the Local Development Plan (LDP) administrative mechanisms. The eight Basilicata Local Action Groups (LAGs) have recently completed the fourth LEADER experience, costing approximately 39 million euros.

Added Value was clearly evident in the LEADER approach in the regional experience during the 2007/2013 programming period, prevalent by virtue of its specific features: area-based local development strategies, bottom-up design and implementation of strategies, local public-private partnership LAGs, Integrated and multi-sectoral actions, innovation, cooperation, networking. The LAGs practiced their decision-making autonomy, provided some flexibility with regard to the implementation of LDP and responded to needs expressed by reference territories in a more adherent and immediate way. The aim of this paper is to evaluate the added value of the LEADER method and highlight the differences from the ordinary measures of the RDP.

The Basilicata LAGs have adopted 68% of the initiatives initiating the "public call" procedure, 8% "direct" and 24% "directing in agreement".

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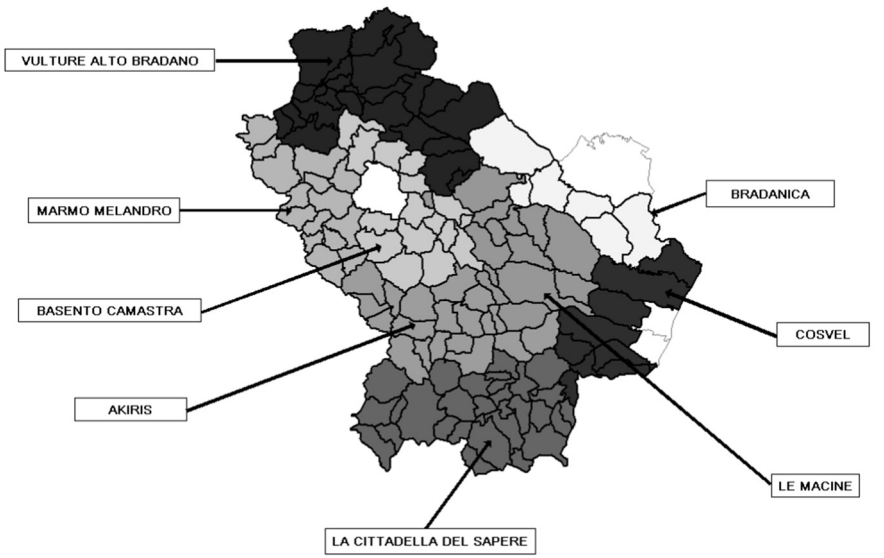
 ISBN 9788891786883

These implementation activities highlight the added value of LEADER in rural development policies (Cacace 2011).

Fig. 1 – Local Action Groups and Baseline Regions in the LEADER 2007-2013 approach



Source: Basilicata Region

2. Materials and methods

In order to grasp the "specific aspects" of LEADER and the main lessons from previous experiences, CREA carried out a qualitative survey to observe Basilicata LAGs in more detail. In particular, to evaluate added value, CREA (Political-Bio-economy) analyzed a wide variety of LAG local experience projects, fourteen projects in particular were chosen on the basis of some contextual elements: procedural form - which LAG had activated projects using the "public call" procedure, and financial weight - which LAG had invested the most financial resources. Trough "public call" procedure the LAGs defined the selection criteria and the resulting evaluation grids of the project (D'Oronzio 2011), in line with the guidance provided by the Management Authority for the relevant RDP measures.

Specific qualitative interviews, using a semi-structured questionnaire, revealed the main factors affecting development actions, including the respon-

siveness of LAGs to the real needs of the territory, the recovery and revitalization of local know-how and traditions, the degree of local actors' participation and a growing sense of belonging and advocacy. Interviews were carried out with LAG directors and revealed a direct link between the projects and the overall LDP strategy, the added value of the LEADER project compared with ordinary RDP measures issued by the Region and the projects which demonstrated more innovative features. CREA researchers supported LAGs over a 6-month period via telephone contact and on-site meetings to facilitate the constant flow of information needed.

3. Results

These projects have performed well in terms of spending, demonstrating how shared and bottom-up activities can reach the goal of maximum involvement of local operators through a positive response to participation.

The total expenditure from these projects amounts to Euro 7.214.633,00 with 381 beneficiaries: 177 project beneficiaries are aimed at increasing the competitiveness of LEADER areas, of which 72 are in innovation in enterprises and 67 in support of the supply chain and multi-productive sectors; 21 beneficiaries for action regarding the exploitation of local natural resources and rural areas; 107 for widespread hospitality, 47 for the strengthening of local products, 16 for the diversification of the local businesses, 13 for the enhancement and enjoyment of natural spaces.

The Basilicata LAGs LEADER method plays a strategic role in the formation of social capital, stimulating the creation of local partnerships, promoting sustainable rural area development favoring the mobilization of endogenous development potential. The LEADER method supports, at a territorial level, processes for building public and private relational networks between actors belonging to different sectors of the economy and rural society. The eight LAGs have therefore highlighted a link with the territory, proximity to the community, knowledge of needs and critical issues and the need to improve design capability allowing local actors to successfully and quickly access funding opportunities.

This study offered LAGs the opportunity to confirm the LEADER method still retains the added value and to highlight the differences between Leader method and RDP:

Tab. 1 – Differences between Leader method and ordinary measure of RDP

LEADER METHOD	ORDINARY MEASURE OF RDP
BOTTOM UP APPROACH	TOP DOWN APPROACH
DEFINED TERRITORY	FULL REGION
ELEMENTS OF FLEXIBILITY IN THE PUBLIC CALLS: SPECIFIC SELECTION CRITERIA	RIGID PROCEDURES AND GENERAL SELECTION CRITERIA
ANIMATION ACTIVITIES	MAY BE ADDED TO THE MEASURE IF THE ADG FINDS IT NECESSARY
LOCAL PARTNERSHIP REPRESENTING THE TERRITORY	RDP INSTITUTIONAL PARTNERSHIP
IMPLEMENTATION ARRANGEMENTS: PUBLIC CALLS, DIRECT ORGANISATION AND ORGANISATION IN CONVENTIONS.	IMPLEMENTATION ARRANGEMENTS: PUBLIC CALLS

Source: Council for Agricultural Research and Economics (CREA)

The LAGs invested time and human resources in developing projects and animation and co-ordination were essential elements needed to develop a collective approach (an added expenditure since the establishment of the LDP). The respective LDPs for each LAG were: shared, characterized by specific actions and governed.

The added value of LEADER is not due to a particular project or a specific eligible expenditure category, but to those implementing mechanisms which will enhance the collaborative role which the LAG can play in their respective territories. A project is integrated when the LAG amalgamates a single investment with another project or with a collective project. Innovation is generated by relationships (Tenna, 2015).

Various changes were made to LEADER during the programming and the particular features entrusted to the method were not questioned. LEADER will, as always, be subject to new feedback in the 2014-2020 programming, and focus will be on innovation and added value. The LAGs will be called upon to showcase the quality of their role as local animators and territorial development promoters, as well as for their managerial, design and development skills, paying careful and close attention to the needs of the area.

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THE IMPACT OF NEW TECHNOLOGIES ON COMPETITIVENESS AND PRODUCTIVITY OF RURAL SMES: A CROSS-COUNTRY EXPLORATORY SURVEY

by *Rosa Maria Fanelli*[*], *Matthew Gorton*[**], *Pattanapong Tiwasing*[***], *Jeremy Phillipson*[****], *Francesca Cuna*[*****] and *Giuseppe Cutillo*[*****]

1. Objectives and methods

The adoption of technologies by small and medium enterprises (SMEs) that operating in several business sectors in rural areas is crucial issue because they often need financial and technical incentives and support from public and local authorities. The question whether and how innovation can be replicated and applied in a wider context is strictly connected to the understanding of those factors and mechanisms capable to determine success or failure of the introduction of innovation itself.

Our aims will be to present the impact of 12 new technologies suitable for rural economy SMEs, to identify the enablers and barriers for adopting each technology, to support rural economy, and to provide policy recommendations useful for the public authorities on how to establish favourable conditions and offer incentives to SMEs for integrating innovative solutions. We want to respond the following questions. What type of technology is adopted by rural SMEs? What aims are most crucial for them? What are the enablers and barriers for adopting each technology to support rural economy? How to establish favourable conditions and offer incentives to SMEs for integrating innovative solutions? At the end, we want to examine the effects of the socio-economic characteristics of rural SME respondents.

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 ISBN 9788891786883

The methodological approach to examine the impact of the selected new technologies will be based on desk research and field research evidence on a case study basis.

To select these technologies, we will take into account only the recent resources and research studies that have been implemented during the last years (Acs and Mueller, 2008; Autio and Hoeltzl, 2008; Autio and Acs, 2010; Bigliardi, 2013; Branzei and Vertinsky, 2006; Calvo, 2006; Delmar et al., 2013; Deschryvere, 2008; Fabling and Grimes, 2007; Forsman and Annala, 2011; Freel and Robson, 2004; Henrekson and Johansson, 2008; Hölzl, 2009; Koellinger, 2008; Parker et al., 2010; Thornhill and Gellatly, 2005; Thornhill, 2006).

On base of these studies, we will select 12 disruptive technologies (i.e. organic farming, renewable energy, precision agriculture, crop resistance systems, novel crop, functional foods, e-platforms for products' promotion and exports, online orders and delivery tools, food traceability systems as marketing tool, smart meters and IoT, internal products traceability systems and traceability and selective breeding and cultivation processes as a supply chain management tool).

In the second step, the online questionnaire, will design to collect evidence and draw on the expertise of target respondents related to cases of innovative technology adoption by firm in remote and accessible rural areas. The questionnaire will structure into three main sections. The Section A will include questions to identify the region in which the enterprises operating, the main core business and the dimension of rural SMEs. The Section B will dealt with issues related to the use of particular innovation technologies, the type of innovation used, what barriers and enabling factors can hinder and support respectively the adoption and dissemination of new technologies. The last Section C will dealt with demographic characteristic that influencing the adoption of new technologies by rural SMEs

Using information on this exploratory sample rural SMEs across eight European countries (Bulgaria, Czech Republic, Greece, Hungary, Italy, Latvia, Slovenia and United Kingdom) we will explore the potential relationship among the variables to investigate innovative technologies impact on rural economy SMEs competitiveness and productivity. Descriptive statistics will apply to describe the case identity in Section A. Needs, enables and barriers of the case, in group different, will analyze, using Chi-Square Test and Mann-Whitney U Test. At the end, Discriminant Analysis (DA) will use to examine the effects of the socio-economic characteristics of rural SMEs respondents from eight countries.

The $\chi 2$ statistic is strong with respect to the distribution of the data like all no-parametric statistics. To will draw out some of the key features of the main needs/objectives, which will lead rural SMEs to adopt the new technology, the questionnaires will design to give answers at the categorical level, so the $\chi 2$ statistic will be appropriately used. To investigate the difficulties/barriers SMEs encountered during the integration or adoption of new technology, questions will design as a Likert-Scale. The scale to use will be 1-5, where 1 = no difficulties and 5 = most important difficulty. Data will measure on an ordinal scale, which are non-parametric, so we will apply MWU test to analyse the difference between rural SMEs with and without job generation, with and without improved ability to access new markets, and with and without improved profitability. The results of the MWU will be presented in group rank differences rather than group mean differences. For the section C, we will employ discriminate analysis (DA) to examine the effects of the socio-economic characteristics of rural SME respondents from the eight countries. DA is commonly designed to investigate the difference between two or more observed groups with respect to several underlying variables. We will use questionnaires because are the main method of data collection used in many previous innovation studies (Bouncken and Koch, 2007; Hult et al., 2004; Laforet and Tann, 2006).

2. Expected results of the impact and transferability of the case

The study will promote the adoption of innovation by rural economy small and medium enterprises (SMEs), through sharing practices/experiences between regions and actors relevant to rural economy SMEs' competitiveness and integration lessons learnt into regional policies and action plans. Expected results should boost innovation support services for 5% of SMEs, increase the capacity of about 200 public administration employees to effectively implement policies to support the competitiveness of firms operating in rural economies and improve its horizontal and vertical cooperation. In this way, territorial capacity building and policy innovation involving all regional actors are critical factors for promoting the diffusion of innovation and, to maintain and strengthen SMEs' competitiveness and consequently regions' growth.

The key question underlying the research is the extent to which small and medium enterprises located in rural areas have distinctive support needs, associated with the characteristics of rural SMEs themselves, or their owners,

and/or the characteristics of the external operating environment for enterprises in rural areas.

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DO RURAL POLICIES IMPACT ON-FARM DIVERSIFICATION IN ITALY? THE CASE STUDY OF AGRITOURISM

by *Davide Marino*[*], *Vincenzo Giaccio*[**], *Luigi Mastronardi*[***], *Agostino Giannelli*[*] and *Alfonso Scardera*[****]

1. Introduction

This paper investigates whether European and National policies, through the analysis of financial support deriving from the Common Agricultural Policy (CAP) (First and Second Pillar) and national and local subsidies, have influenced diversification on Italian farms. The paper takes particular interest in agritourism activities in relation to farm diversification.

Since the 1990s, rural areas have been affected by a restructuring process (Marsden, 1998) in which agriculture, as an activity aimed exclusively at the production of goods (Lowe et al., 1993; Murdoch and Ward, 1997), has acquired a multifunctional role as regards the capacity of the sector to jointly produce market and non-market outputs (OECD, 1998) and differentiated according to the territorial specificities (Murdoch et al., 2003).

This process has especially involved small and medium farms, needy to find ways to increase and diversify income from agricultural activities.

Diversification involves «the utilisation of resources internal to the farm to produce goods and services different from those normally produced», but it does not exclude the potential of on-farm non-agricultural activities for diversification, including various forms of rural tourism (Henke et al., 2013). In any case, the agriculture is considered diversified if it is "capable of absolving diverse functions in the rural space and in the regional economy" (Rocchi and Sotte, 2017).

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 ISBN 9788891786883

Diversification processes have been strongly supported by agricultural and rural development policies and implemented in the Agenda 2000.

This has significantly influenced the aims of instruments for financing these policies, identified as the First and Second Pillars of the Common Agriculture Policy: the diversification of income and the recognition of the multifunctionality of agricultural activities represent the real objectives of rural policies put in place over the past several decades (European Commission, 1997). Moreover, literature consider farm diversification and entrepreneurial decision-making very sensitive to funding allocated by the EU (Boháčková and Hrabánková, 2011).

Payments for the First Pillar have mostly benefited the large, market-oriented farms, located in the plains (El Benni *et al*., 2012). In contrast, some measures of the second Pillar, specifically those identified as compensatory payments and agri-environmental payments, have generally benefited the farms that are located in marginal areas from a territorial and economic perspective.

Nevertheless, it seems that the various reforms of the Common Agriculture Policy (CAP) have not provided sufficient funding for its full realisation or sufficiently remunerated farms with diversified activities.

2. Materials and methods

We consider agritourism as an example of diversification in Italy, inasmuch it is a phenomenon that is strongly grounded at the national level (Mastronardi et al., 2015).

So, this paper intends to evaluate the influence that these financial supports, put in place by policies at the European and national levels, have had on agritourism in Italy. For this purpose, the authors have been proposing a comparison between Italian farms offering tourism services and farms without agritourism, by stressing the distribution of public financial supports in the 2015.

In this paper, the authors will be used Italian data in the FADN (Farm Accountancy Data Network (2015) dataset in order to compare financial supports obtained by farms with agritourism with those of the rest of the sample. The European FADN was created to represent farms' technical and economic operation in the European Union and on which it drafts the agricultural and rural policies. The groups of farms with and without agritourism included in the FADN Dataset will be compared using statistical tests on the differences between mean, median and variance values of samples assuming

as threshold of acceptance a p-value equal to 0.05. The tests adopted are of parametric type (Student's t-test and Fisher-Snedecor F-test) for mean and variance and non-parametric (Wilcoxon signed-rank z test) for the median. A comparison will be performed by farm size (Standard Output) and altimetric zone in the two groups. ANOVA test has been performed to evaluate if there were at least two groups whose means are significantly different.

3. Results

Diversification in agritourism is manifested through the presence of recreational-cultural services (e.g., hospitality, dining) and through connections with safeguard and valorisation of the territory (e.g., direct selling, bird-watching) (Haghiri and Okech, 2011).

Recent studies show a significant relationship between agritourism incomes and European Union's subsidies provided by the Rural Development Plans (RDP) First Pillar and State aid to agriculture (Giaccio et. al., 2018; Galluzzo, 2016).

Surely, thanks to these external economic supports, agritourism businesses have increased in importance in Europe, and particularly in Italy.

But, the decision to diversify activities in a multifunctional farm is not only dependent on the opportunities offered by Community and national policy but is also influenced by other factors, as for examples, on their capacity to create new value, in response to new social demands (Marotta and Nazzaro, 2011, 2012).

For these reasons, literature identifies some paths suitable for the creation of value, such as the expansion of traditional income-producing activities, towards new entrepreneurial activities strictly linked to a rural context (broadening); the expansion of agricultural activity towards productions that allow retaining shares of added value (deepening); the integration of farm income with income deriving from activities executed outside the farm (re-grounding), (van der Ploeg et al., 2002).

From the analysis the authors expect that the transfer of community-level funding for rural development (Second Pillar) and national funds have a positive impact on Italian agritourisms, especially for those mostly located in the inner areas where are higher concentrations of protected areas and eno-gastronomic resources, which are factors influencing attractiveness of the area and tourist flows (Lupi et al., 2017). Finally, according to literature the diversification processes have been concerning above all small and medium farms, so it's reasonable to expect lowest funding under the Second Pillar in the case of largest farms, that could benefit mainly about First Pillar subsidies.

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THE AGRI-ENVIRONMENTAL COLLECTIVE ACTIONS IN THE RURAL DEVELOPMENT POLICY 2014-2020: EXPLORING ITALIAN STAKEHOLDERS' PERSPECTIVE

by *Federica Cisilino*[*] and *Francesco Vanni*[**]

1. Background and objectives

In the last 20 years the CAP has gone through a deep reform process, replacing market support mechanisms and payments that are potentially harmful to the environment with possibly more beneficial support, with specific and targeted measures included both in the first pillar (cross compliance, greening) and in the second pillar (agri-environment-climate payments, organic agriculture). Although in different ways, such tools aim at increasing the environmental sustainability of EU farming sector, by favouring the provision of environmental public goods and services.

Amongst the main limitations that have been recognised to agri-environmental schemes (AES), is the fact that such measures do not encourage landscape level coordination, by favouring a farm scale approach leading to individual, disconnected actions (Burton and Paragahawewa, 2011; Prager et al., 2012). On the opposite, environmental public goods could be more effectively delivered if farmers in a given area take joint action, since the provision of environmental goods such as biodiversity and landscape may be ensured only where groups of local stakeholders in rural areas agree to adopt a coordinated approach to resource management (Hodge, 2001).

The latest CAP reform (2014-2020) has tried to stimulate collective approaches to agri-environmental issues in different ways and several collective actions associated to AES have been experimented across Europe, even

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 ISBN 9788891786883

though empirical evidence from such approaches is still relatively scarce (OECD, 2013; Josefsson et al., 2017; Vanni, 2014).

While the majority of the examples of collective AES are located in Northern European Countries (especially in Sweden, Belgium, the Netherlands, Germany, but also in France and in the UK), in Italy so far there have been only a very limited number of attempts to implement collective agri-environmental strategies (Rete Rurale Nazionale, 2015; 2017).

The overall objective of this paper is exploring and analysing the attitudes of the Italian stakeholders towards the implementation of agri-environmental collective actions, in order to identify, on one side, the main limitations that are preventing their adoption and, on the other side, to co-design possible solutions and practical actions with national and local stakeholders.

2. Methodology

The research was carried out during the first National Forum dedicated to environmental agri-environmental issues, organised by the Italian National Rural Network[1]. The event was structured around seven thematic groups and one of them was focused on the role of agri-environmental collective action. In the context of this thematic group, data were collected by using the European Awareness Scenario Workshop (EASW), a methodology that aims at promoting dialogue between all interested parties and local groups, in order to enhance the understanding of problems and to facilitate the consensus on proposed solutions.

The workshop involved 15 stakeholders coming from different Italian regions and, above all, representative of different interest groups, including farmers' associations, managing authorities of rural development programmes, Italian Ministry of Agriculture and Forestry, environmental organisations and local institutions.

In the classic version of EASW, participants are required to discuss on given scenarios in order to establish priorities or best fitted solutions. The choice made for this study was not providing participants with pre-given scenarios, but trying to orientate the discussion around three main focus questions: (1) What is your opinion on measures currently available to support collective projects? (2) What are the main factors that influence the effectiveness and success of the collective projects? (3) What actions are neces-

[1] The forum ACA was held in Rome on March 28-29, 2017. For more information on the Forum, visit the webpage http://www.reterurale.it/forumACA.

sary to fostering the development and dissemination of collective projects nationwide?

Stakeholders were then invited to write down their action proposals in small individual cards in order to express their thoughts and ideas, to attach them on the Metaplan visible to everyone and to present them for a round table discussion. This method allowed to summarise the most important issues/ideas/proposals of each stakeholder, for all items discussed.

3. Results

The research shows that Italian stakeholders are aware of the need of improving the efficiency of AES by promoting collaborative and coordinated strategies at landscape level. At the same time, according to the results arising from the workshop, there are three main challenges that Italian agricultural system has to face in order to enhance and spread the adoption of collective AES.

The first challenge is related to the identification and involvement of intermediary institutions. Examples across Europe show the key role of intermediary actors (such as the environmental cooperatives in the Netherlands) which should be able to engage and coordinate a different stakeholders in the same area. Usually intermediary institutions/associations are the connections between the local and the national level, and are key actors in supporting, planning and implementing collective projects with an environmental focus.

The second challenge is related to issues of managing collective approaches in practice, especially in terms of animating costs and early stage costs, which were perceived as high and consistent.

The third challenge is related to the lack of information, which was generally perceived as a critical issue for potential beneficiaries. In particular, several participants emphasised that it would be very important to support the development of collective projects by providing training, pilot-courses, dissemination of information, experiences exchange on farm, as well as technical assistance and advice. In order to define specific RDPs interventions, "agri-environmental facilitators" could be employed, namely new professional figures that could be very helpful in animating local actors as well as in addressing the main administrative and technical needs.

To conclude, it may be argued that the EASW method allowed to identify roles, values, objectives and expectations of the various stakeholders in the design and implementation collective agri-environmental strategies, as well as identifying the main challenges that RDP should face in order to favour

this approach at the national level. At the same time further research should be carried out in order to produce new ideas for potential action, with a larger involvement of farmers, who should be the most relevant actors in defining and implementing collective AES. Gathering new evidence, meeting various stakeholder of different areas/regions, encouraging the exchange of experience amongst farmers will be part of the next stage of this research.

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AGRI-FOOD ENTREPRENEURSHIP IN RURAL AND PERIPHERAL CONTEXTS: A QUALI-QUANTITATIVE INVESTIGATION IN THE TYRRHENIAN SIDE OF THE PROVINCE OF REGGIO CALABRIA

by *Dario Musolino*[*], *Vincenzo Crea*[**] and *Claudio Marciano*[***]

1. Introduction

This work focuses on excellent agri-food entrepreneurship in highly peripheral and marginal areas. Its objective is to understand if and how such entrepreneurs can be competitive and excellent, although located in very unfavourable contexts, in geographical, social and economic terms. The basic research question of our work can be formulated in these terms: firms located in highly peripheral and marginal areas, like rural and mountain areas in Calabria, suffer strong locational disadvantages: how do they deal with these disadvantages? Can they be competitive, and how, in such contexts?

Clearly, only studying the cases of excellent firms that are placed there (strategy, competitiveness factors, etc.), we can explain if and how it is possible to overcome such locational disadvantages and to be competitive, then getting interesting policy lessons to be learnt.

We tried to address this question exploring and studying the case of the province of Reggio Calabria, in particular its Tyrrhenian side, an extremely peripheral area located in the Italian Mezzogiorno.

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 ISBN 9788891786883

2. Materials and methods

Our work, based on the literature about excellent entrepreneurship[1], was methodologically characterised by a mix of quantitative and qualitative analyses (Braun and Clarke, 2006; Greene, 2007; Johnson and Christensen, 2014).

The quantitative analyses had two main objectives. On the one hand, they aimed at describing and presenting the socio-economic and institutional characteristics of the case study area, using relevant statistics and data taken from several sources and studies. On the other hand, they focused on the performance of the agri-food firms in order to evaluate if they are excellent and competitive. In this case we used quantitative data taken from balance sheets coming from official datasets.

The qualitative analyses, at a second stage of our work, were used to explore causes and reasons of the excellence of some of these firms. We based this qualitative work on the findings of a field research made of a set of direct semi-structured interviews with some of the excellent entrepreneurs identified there. Qualitative data obtained through the interviews were analysed using the thematic analysis.

3. Results

The province of Reggio Calabria, and in particular its Tyrrhenian side, is a scarcely developed area (Musolino et al, 2018). Population, made of about 200k people, suffers a negative demographic trend, has an average income equal to euro 18,082 (23.0% lower than the national average), and the employment rate is 34.9% (56.9% in Italy). Firms are characterised by a low level of internationalization and a scarce attitude to R&D and innovation.

[1] Interestingly, the wide and developed international literature on excellent firms (Coad et al., 2014; Henrekson and Johansson, 2010; Kolar, 2014; OECD, 2002) never focused, as far as we know, on excellent firms located in marginal areas. Most of the studies focused on the methodologies to identify them, but targeting developed areas. In Italy, for example, relevant studies, using both quantitative and qualitative approach, usually focused on developed areas in northern Italy (Campo dall'Orto, 2009; Fondazione Nord-Est, 2005; Preti, 2011), although some studies were also conducted in the Mezzogiorno (Lizzeri, 1983; Pontarollo, 1982; Viesti, 2000; Fortis and Quadro Curzio, 2014; Pirro and Guarini, 2008). All these studies did not find few and clear common characteristics of these firms (and any clear explanatory factors concerning location), but they resulted to be considerably different, in terms of sector, size, geographical area, etc (Kolar, 2014). This is why our research work appears definitely innovative in the context of this literature, as its object, as far as we know, was never investigated until now.

Besides, they are isolated (there is a lack of industrial clusters, differently from other regions in Italy), and they are scarcely interconnected to the main transport networks and nodes. Moreover, they have to cope with remarkable institutional problems, like the low efficiency of public administration and the presence and the influence of the organized crime.

It is true that there is a remarkable presence of farms and food firms, but it is also true they have a highly fragmented entrepreneurial system and that there is clear lack of technologies and market orientation, in particular as concerns farming (Musolino et al., 2018). Olive oil, citrus fruits, processed fruits and vegetables, bakery products, are the main branches of specialization.

Despite this situation, the data about balance sheets that we could analyse show that it is not impossible to be an highly profitable and performing agri-food firm in such a geographical area; it means that it is possible for them to be competitive and excellent (Musolino et al., 2018). Data about turnover, productivity (value added per employee) and profitability (Ebitda on turnover) in fact show that in the Tyrrhenian side of the province of Reggio Calabria there are firms that have a good economic performance, and that are even able to increase it in the medium run. Furthermore, interestingly, the percentage of highly performing firms (excellent firms with a positive Ebitda margin) is on the increase in the medium run.

Which are the key factors to explain the performance of excellent firms in such a socio-economic and institutional context? The qualitative investigation made of a set of direct interviews with seven entrepreneurs gave us several explanatory elements (Musolino et al., 2018).

The first point underlined by the interviewees is the high quality and the unique identity of their products, based on the high quality and the uniqueness of the local agricultural resources, strongly linked to the territorial vocations. It is interesting to notice that interviewees always point out the high quality of the local raw materials, for example or the local olive oil or the citrus fruits, and the excellent quality, in agronomic terms, of the territory of the case study area. Clearly, the more they suffer additional costs related to their peripherality and marginality (for example, higher transportation costs, as pointed out by many of them), the more they need to create unique, valuable, with high valued added, products, in order to be competitive.

Secondly, in order to produce such high quality products, and then to find their niche market where to get a competitive absolute market advantage, agri-food entrepreneurs, even if small, in many cases make research and innovation. It is rather surprising to learn that small firms, much far from the main urban areas, are able to be part of projects and networks with important universities in order to do R&D in their sector.

Thirdly, another factor that came up from the interviews is the so-called "human factor": that is to say, the family linkages. Family linkages result to be a fundamental factor in the firms' ownership, management and in all business areas. As concerns either the own family of the entrepreneurs or the families of the employees, family linkages are the privileged way to recruit new employees. While generational change fails in other entrepreneurial systems weakening the family linkages, as happens in the industrial districts, in this extremely marginal area family linkages still seem robust, being one of the keys to face cohesively the challenges determined by the unfavourable context.

Fourthly, another important element comes out concerning internationalisation. We would have expected that firms located in such peripheral areas look first at their own regional and internal market; instead, interestingly, many of them look much far from their "own garden", as they are significantly export-oriented. We can even say that some of them they almost disregard it. Some of them sell abroad even more than 90% of their turnover. Moreover, they use a wide range of alternative distribution channels, ranging from the traditional ones (fairs), to the most innovative (highly specialized independent – biological – shops, airport shops, marketplaces like Eataly, etc.).

As a last remark, emerging from the analysis of the interviews, it is interesting to point out their criticism to most of the local institutions, that do not have a clear and coherent development strategy for the local agri-food sector, and that are not able to support firms in their effort to invest, grow and reach the central and foreign markets. Interviewees cast light on the lack of competence and professionalism in many institutions, but they also pointed out that institutions themselves are peripheral and far the main institutional networks. Somehow, the entire institutional and entrepreneurial system also suffers from the very peripheral location.

In conclusion, our quali-quantitative investigation in the province of Reggio Calabria shows that it is possible to be competitive and excellent in highly peripheral and marginal areas. Policy implications of these findings are clear: firms should be better supported and leaded by local institutions in their effort to exploit at their best their absolute advantages (unique local resources). Initiatives of integrated rural and local development, based on bottom-up approaches and collaboration between the private and public sector, can be an innovative and effective tool (Marcianò and Romeo, 2016). Moreover, improving transport accessibility remains a key point for firms placed in marginal areas, but strongly interested in reaching global markets.

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ORGANIC SUPPLY CHAINS: WHICH CONTRIBUTE TO THE TERRIORIAL SOCIAL RESPONSIBILITY

by *Laura Viganò*[*] and *Alberto Sturla*[**]

1. Introduction

Territorial Social responsibility (TSR) defines a collective approach to sustainability issues, where community as a whole is involved in local development, requiring actors' mutual engagement in respect to a common issue (Giunta et al., 2006; Peraro, 2007; Ashley, 2012; Del Baldo & Demartini, 2016).

The adjective "territorial" implies that the development process must be directed towards specific needs to be met through specific measures. This is why there is no TSR without: 1) the pursue of sustainability along its three pillars; 2) a system of governance that coordinates actors around shared values and ensures that every layer of local society benefits from the sustainable development process.

Socio-economic literature provides several evidences of organic farming capacity of spreading social responsibility values along the supply chains, by mean of: higher integration with the territory, increased awareness of farmers and consumers, greater closeness to consumers and more attention to consumers' education and sharing of values (Goldberger, 2001; Stagl, 2002; Marsden & Smith, 2005; Shreck et al., 2006; Shermer & Kirchengast, 2008; Lobley et al., 2011; Sheth et al., 2011). Therefore, it would be of a certain interest to explore whether, in territories with a strong concentration of organic farms, such a set of values can be moved from an organic supply chain to a community as a whole, thus acting as a common cultural platform

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 ISBN 9788891786883

providing the basis for the institutionalization of a participatory model and, at the same time, ensuring its efficiency.

In the present study the processes activated by the supply chains – context interactions are discussed as a necessary steps toward the acquisition of a stage of maturity where TSR is formalized by mean of a territorial subject, namely the Biodistretto of the Val di Vara.

2. The methodological framework

The research has been carried out in Varese Ligure, a municipality of Italian North-eastern Apennines whose administrators have been showing a long term commitment to sustainable development that has brought to the conversion to organic farming of most of the farms and the complete renewal of the structures of the two local cooperatives (dairy and meat). The presence of two structured and viable supply chains has prompted the spreading of organic farming in nearby municipalities at the point that, in 2013, the organic district "Alta Val di Vara" could establish, having reached territorial requirements provided by regional legislation.

The study is based on a qualitative analysis, carried out by gathering the information retrieved both from direct and indirect sources into a model that takes into account the mutual influence between the local context and the supply chain. According to this approach, local context and supply chains influence each other along a series of directions that represent indispensable conditions for the development process to be truly sustainable.

The main assumption that underlies the construction of such an analytical scheme is that TSR ensures compliance with three principles, without which there's no sustainability.

GLOBALITY: Sustainability must be pursued along its three pillars by activating all the components of context and supply chains (Franceschetti, 1995).

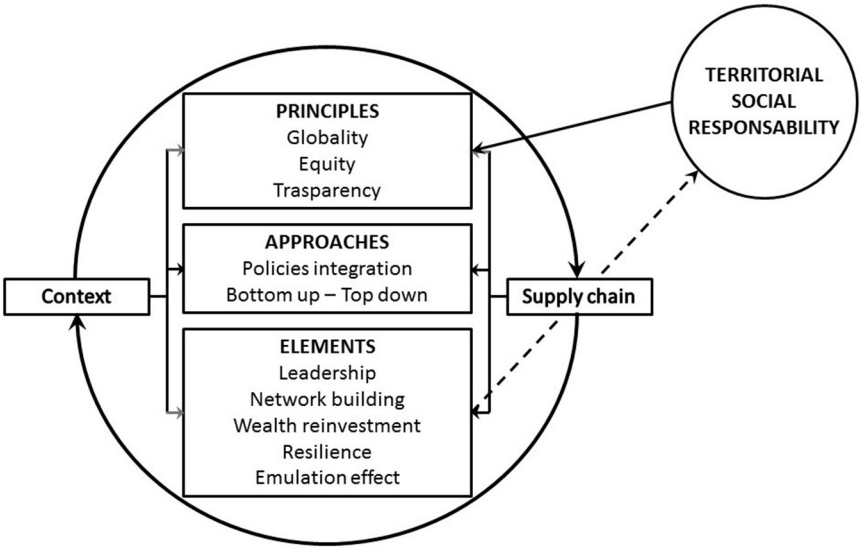
EQUITY: It is satisfied when all parties benefit from the development process (win-win approach) and the inevitable trade-offs are minimized and balanced among different social, economic and environmental components (Franceschetti, 1995).

TRANSPARENCY: implies the voluntary subordination of personal interests to public ones by each of the actors involved, thus excluding any kind of opportunistic behaviour.

Compliance with the principles of globality, equity and transparency implies the adoption of specific approaches and the presence of some key ele-

ments to ensure that development processes move towards levels of increasing sustainability, thus giving solidity to TSR itself (figure 1).

Fig. 1 – Supply chains and context sustainability: principles approaches and elements



Source: our processing

3. Results and conclusions

In figure 2 are shown in a glance the main steps of the development process that brought to the organic district; those that entirely developed inside the two supply chains are highlighted with a box in a continuous line, while those while those that have arisen outside them are pinpointed with a dotted line

Fig. 2 – Steps toward sustainable local development in Varese Ligure

	Context	Supply chains
1990	Restoration of the historical center	
1994		The milk cooperative is equipped with a dairy and a sale point
1997	Establishment of environmental education center	The meat cooperative joins the organic certification scheme
1999	Varese Ligure obtains the Certification UNI EN ISO 14001 & EMAS certification	The milk cooperative joins the organic certification scheme
2000	First two wind turbines are installed	
2003	Photovoltaic panels are installed on the rooftop of the local school and town hall	The Consortuim «Valle del Biologico» is constituted
2004		Restoration of the slaughterhouse
2005	Upgrading of the wind farm (7 mil. Kwh/year)	
2006	Varese Ligure joins Green public procurement schemes for municipal expenditure	
2007	Establishment of an in house society for waterworks management	
2008	Installation of U.V. purifiers in the aqueduct	
2009	In house management of the municipal landfill	The meat cooperative is equipped with a packaging workroom
2009	Broadband reaches hamlets of Varese Ligure	
2010	A call for a solar purchasing group is issued	The meat cooperative is equipped with sale point
2011	The cultural association «Biological» is constituted	
2012		A supply chain for the local hen (gallo nero) is set up
2013	Establishment of the Organic District «Alta Val di Vara»	The «organic help desk» opens in the local library

The results have shown that processes undertaken in Varese Ligure almost thirty years ago has routed local development along the three pillars of sustainability, at the same time identifying in the strengthening of supply chains by including the transformation of raw materials as the only viable

way to guarantee the economic feasibility of the agricultural activities and the maintenance of the rural territory. A complex virtuous cycle of reciprocal influences between the context and supply chains, originated by the primeval urgency of counteracting depopulation, today has come to feed a system devoted to the preservation of a solid reputation based on the conservation of the specificity of the territory through its supply chains.

Interviews have shown that equity principle has been affected by incomplete participation to choices taken by the administrators, limited to stakeholders without reaching community at large. Likewise, proper awareness of civil society about the development processes activated in the area and, therefore, about the role of organic farming for the sustainability of the territory, has never been fostered, in a way that transparency principle appears to be neglected. Transparency at the supply chain level goes beyond the guarantees of the organic certification, especially in the meat sector, where farmer's are constantly motivated by being involved in decision making at the point that they feel part of a common project that is not limited to the sole provision of quality food but involves conservation and economic viability of the territory, as well.

The introduction of organic farming acted as an element of innovation that favored the creations of networks that go beyond the mere economic sphere of the supply chains up to involve sectors of local community outside agriculture. For their part, the actions of the two cooperatives are now rooted in a dense web of relations (with the farmers, clients, distributors, consumers), that have the relevance of contributing to the creation of a collective responsibility for the territory, that, although has not still reached population at large, is the basis for TSR. On the other hand, the organic district is a product of a territory socially mature enough to produce by its own forces a new organizational model. The path towards the construction of a widespread TSR in Varese Ligure as well as in other territories with a strong presence of organic farming must focus on two fundamental aspects, such as the strengthening of social capital and the development of a training system. The first one is possible through: 1) the mapping of all the stakeholder and organizing them directly or through representatives, in advisory or decision-making bodies, such as committees, partnerships, working groups, etc.; 2) the continuing check of the results and their dissemination by social reports or similar tools; 3) the implementation of an efficient evaluation and monitoring system.

The second one must be able to meet the local demand for training and to provide technical support and assistance, not just for organic farms but extended to other activities, also in order to stimulate their diversification. Organic districts, once established and recognized by hierarchically superior subjects (e.g. the Regions), could be able to organize training activities,

providing for the necessary financial resources and meeting local demand more precisely. Organic districts are multiplying fast all over Italy, further steps of research should therefore provide for a comparative analysis of these experiences in order to classify them on the basis of their capability of activating social responsible territories, in accordance with their peculiar development path, their economy and societal features.

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CORPORATE SOCIAL RESPONSIBILITY IN ITALIAN AGRI-FOOD FIRMS: THE RELATIONSHIP BETWEEN CSR ACTIONS AND FIRM'S PERFORMANCE

by *Adele Coppola*[*] and *Sara Ianuario*[*]

1. Objectives

In the agri-food sector Corporate Social Responsibility (CSR) involves different fields of action, from the use of natural resources such as water and energy, to waste management, animal welfare, food safety and quality, fair trade, labour conditions (Maloni and Brown, 2006). The choice of specific CSR actions depends on the sustainability vision of firm's managers, the firm's objectives and external pressures of stakeholders (Maloni and Brown, 2006; Briamonte et al., 2008, Briamonte, 2010; Hartmann, 2011; Rankin et al., 2011; Coppola and Ianuario, 2015; 2017).

The present work aimed at understanding the relationship between CSR and firm's economic performance. In particular, the main objective is to verify whether there is a relationship between CSR strategies of agri-food firms and their economic and financial performance (CFP). A second objective of the work is to verify whether there is a direct link between CSR and CFP or rather this relationship is mediated by some variables, innovation as an example. Moreover, as co-operatives are often deemed more adequate to pursue sustainability goals with respect to other business models, we wanted to test differences in CSR strategies and financial performance between cooperatives and for-profit firms.

In particular, assuming a stakeholder theory perspective and taking into account the CSP–CFP multilevel framework of Perrini et al. (2011), the model we wanted to test is shown in figure 1.

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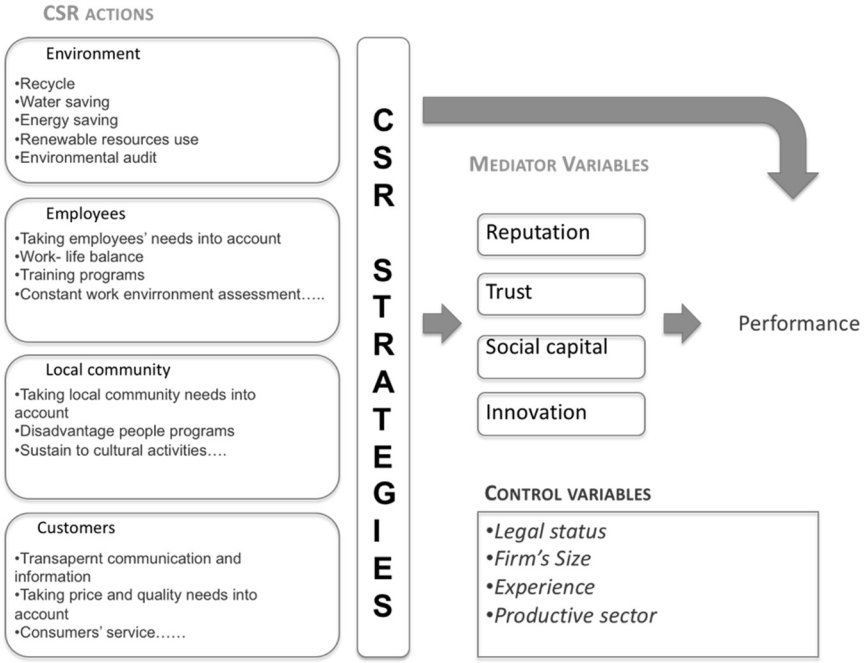
 ISBN 9788891786883

Fig. 1 – CSR- Firm's Performance Model



Source: authors' elaboration

2. Data and Methods

Data collection was carried out in two steps.

First, agri-food firms have been selected from the database AIDA that includes detailed information on Italian companies, such as financial data, legal entity details and corporate structures. In this step data were extracted with reference to processing and handling vegetables and fruit, and milk. The list included 2.483 firms. Starting from this list, in a second step companies were reached by phone and were asked to fill a questionnaire that was send by mail. The questionnaire was distinguished in three sections:

- Management's sustainability view and the relevance given to the sustainability issue;
- CSR actions undertaken by the firm and their relevance in the business strategy;
- Main structural, production and market characteristics of the firm.

Almost 300 firms have been reached by phone and at the moment 40 questionnaires have been filled. Given the small sample, the present work has only a descriptive nature and aims at understanding the relationship among variables and at clarifying the role of different variables in the model. First, we carried out an explorative PCA on CSR actions undertaken by the firms in order to verify the first part of the model, that is the kind of components that are relevant to define the CSR strategy. Secondly, based on factor loadings, by means of a hierarchical cluster analysis we identified groups of firms to which different CSR strategies can be associated. Finally, to verify the relationship between CSR actions, innovations and performance we analyzed correlations indexes between actions and performance (direct relationship), between actions and innovations, between innovations and performance indicators (indirect relationship). As control variables are concerned, by means of ANOVA or Kruskal Wallis test, we tested differences of CSR components and performance indicators taking into account groups of firms by size, legal form, experience.

3. Results

Two main results of PCA ca be underlined. Firstly, 5 components were extracted instead of 4 as we expected according to the stakeholder theory. In particular, two different components refer to the environmental dimension, one related to protection actions and the other one to resource saving, mainly linked to economic objectives and to costs reduction strategies. Secondly, the social involvement characterizes the firm's behaviour as a whole, with no distinction according to the stakeholder category (community or employees). Measures focused on employees represent a different group of actions when they deal with firm-employees relationship (training and attention to stable job link).

By means of a hierarchical cluster analysis we identified 3 groups of firms characterized by different behaviour with respect to CSR component results. The groups mainly differ as actions focused on customers' need, environmental protection and resources' use reduction are concerned. On the contrary, CSR actions related to the social field and actions focused on the employees-firm relationship are very largely distributed in each group without any statistically significant difference among them.

Group 1 is mainly characterized by the relevance of measures aimed at environmental protection and share with group 3 the attention to customers' needs. The main difference between group 1 and 3 concerns the type of environmental measures they implemented: more focused on environmental

protection (group 1) and on resources' saving (group 3). Group 2 shows a very different behaviour and, generally speaking, is less oriented to CSR actions.

The adoption of innovations is a multiplier process: product innovations require a change in the firm organization or processes, and process innovations require a change in the organization and so on. That is highlighted by the correlation indexes among innovation categories.

Looking at the link between CSR actions and innovations we found few significant correlations and, generally speaking, these links are rather weak. Eventually, very few are the links between CSR actions and performance and between innovations and performance and co-operative and for profit firms don't show any significant difference in CSR strategies and financial performance.

Even if the results are not supporting the hypothesis of a strong relationship between CSR and firm's performance, this preliminary analysis can help to draw some first concluding remarks and give insight for the development of further research steps. In particular:

- CSR actions should be better specified with reference to the firm's objective and strategies;
- Innovations relevant to CSR strategy should be better identified;
- The direction of the innovation-CSR relationship should be verified;
- Profitability indicators aren't able to catch the effects of CSR actions. Non- market components should be included in the analysis and the value creation chain should be investigated as a whole.

There is the need to furtherly distinguish within the co-operatives sample according to real operating organization and objectives.

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A SOCIAL ACCOUNTING MATRIX FOR A STRUCTURAL ANALYSIS OF THE BASILICATA'S AGRIFOOD SECTOR

by *Mauro Viccaro*[*], *Benedetto Rocchi*[**], *Mario Cozzi*[***] and *Severino Romano*[***]

1. Introduction

Local agri-food products are increasingly perceived as a form of cultural capital, representing potentially fruitful resources for rural development (Brunori and Rossi, 2000; Marsden et al., 2000). Italy and its regions offer a rich and diverse agricultural and food heritage that has led to the creation of several quality agri-food systems (Platania et al., 2015) scattered across the whole Italian territory that could create new opportunities for rural development. Despite their ability to absorb disturbances and maintain their functions (Conway, 2007; Thompson and Scoones, 2009), it is important to develop economic models to analyse the relationships among the components of food systems, in order to identify their strengths and weaknesses and drive the implementation of sectoral policies (Jarosz, 2000). In this framework, it is important to point out that any strategy of sectoral development should be based on top-down multi-sector approaches, which take into account the dynamics of the agri-food sector within the wider regional economic system.

Based on that, the aim of this work is to analyse the structure of the Basilicata's agri-food system using a multi-sector model based on a Social Accounting Matrix (SAM) (Rocchi et al., 2015; Viccaro et al., 2017, 2018), specifically developed for Basilicata, an Italian region characterised by a highly specialised agri-food sector (Platania et al., 2015).

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 ISBN 9788891786883

2. Materials and methods

The SAM used in this study is a two-region (Basilicata vs. Rest of Italy) matrix referring to 2011. The structure of the matrix includes a total of 347 accounts; the account concerning the food industry activities has been broken down into ten sub-sectors, while agriculture has been broken down into 5 production activities.

Starting from the SAM, the structural analysis of Basilicata's agri-food system was carried out using the sub-system approach proposed by Momigliano and Siniscalco (Momigliano and Siniscalco 1982; Viccaro et al., 2018). The input-output approach is based on the representation of the interdependencies existing between different economic sectors. In the sub-system approach the production system is divided into blocks, constituted by the shares of the production sectors represented in the I-O table that are directly and indirectly committed to satisfying the final demand towards different categories of goods. Although the reclassification by subsystems (based only on the matrix of coefficients representing the interdependencies existing among different production sector) does not consider the feedback through the consumption, the application of the sub-system approach to a two-region model, like that used in this study, makes it possible to extend the analysis to the participation of each region's sectors in the fulfilment of the demand addressed to the production sectors of the other region.

3. Results

The results of the subsystem-analysis in Table 1, show the contribution of each sector of Basilicata's agri-food industry to four different subsystems of the Italian economic system (Basilicata and Rest of Italy) satisfying certain "blocks" of final demand. Comparing the data classified as "sector", it is possible to see how industrial activities tend to meet the sectoral specific demand more than the agricultural activities (except only those of the farms specialised in horticulture that represent, however, a negligible component of Basilicata's agriculture). The participation in the subsystems associated with the demand of the other sectors of Basilicata's agri-food industry is quite variable in the case of the regional food industry, ranging from 15% of the activity of grains and starch products to 2.2% of the meat-processing industry. The value is more homogeneous in the case of agricultural sectors, which commit, on average, around 11% of their activity to the participation in other subsystems. The datum shows the degree of integration between the

components of the agri-food system and could be an interesting indicator of possible areas for innovation to promote its competitiveness, also to fulfil the final demand for accommodation and food services.

Considering the participation in subsystems oriented to the final demand of the other regions (Rest of Italy), the higher percentage in agricultural branches may represent an interesting opportunity for the economy in so far as it expresses the capacity of "attracting" (either directly or indirectly) a higher share of final demand towards the regional production system.

Tab. 1 – Share of Basilicata's agri-food sectors to the various "blocks" of the production area

Agri-food sectors	Blocks of final demand			
	Sector	Other agri-food sectors	Other regional sectors	Rest of Italy
Cereal grains	46.5%	11.8%	3.2%	38.5%
Horticulture	76.0%	3.3%	7.3%	13.3%
Permanent crops	45.9%	12.5%	3.3%	38.3%
Livestock	46.5%	11.6%	3.2%	38.7%
Mixed	46.2%	11.9%	3.2%	38.7%
Meat	81.2%	2.2%	3.8%	12.8%
Fish	42.1%	11.5%	22.6%	23.8%
Olive oil	70.7%	5.9%	6.9%	16.5%
Vegetable oils, sugar, pasta	76.3%	2.6%	6.3%	14.8%
Vegetables and fruits	67.3%	6.2%	8.5%	18.0%
Dairy products	77.3%	2.2%	4.5%	16.0%
Cereals	47.9%	15.2%	2.9%	34.1%
Animal feed	54.4%	12.2%	1.1%	32.3%
Wine	61.4%	5.6%	5.5%	27.5%
Water and other beverage	70.6%	1.9%	10.0%	17.6%

To enhance the positive impact of agri-food production activities on the regional economic development, two basic strategies may be followed.

The first consists in attracting increasing shares of non-regional demand towards Basilicata's products: if the participation in the market of agricultural commodities (like in the case of cereals for the pasta industry) is an important business segment in Basilicata's agri-food system, it can and must be made stable by innovation processes aimed at increasing the qualitative differentiation of products. The second strategy could be described as the

strengthening of interdependencies within the regional production system aimed at increasing the share of the multiplier effect remaining within the regional economic system. The analysis has shown that in Basilicata the integration between food production and restaurant and accommodation services is lower than in other Italian regions. But there also is much room for intensifying the interdependencies of the regional agri-food system with elements of the public administration (such as, for instance, public providing activities in school canteens or in hospitals). These market opportunities would be useful to improve final consumers' awareness of regional production peculiarities and might have long-term additional effects on the growth of demand addressed towards the regional production system.

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IMMIGRANTS IN AGRICULTURAL SECTOR IN SICILY: THE EXPERIENCE OF "SICILIA INTEGRA" PROJECT

by *Giuseppe Timpanaro*[*], *Paolo Guarnaccia*[**], *Giovanni Dara Guccione*[***], *Dario Macaluso*[***] and *Gabriella Ricciardi*[***]

1. Introduction

Survey of CREA – PB on migrant workers in agriculture shows that in 2015, 47,038 foreign (non-EU and new EU) workers were employed in agricultural activities provided a total of approximately 4,750,000 working days, equal to a total of 37,675 equivalent workforce. The working days of non-EU workers, net of those lent by Community workers (about 2,110,000), totaled approximately 2,640,000.

In general, the migratory flow in the island is incessant; the consistency of immigrants that arrive on the Italian and especially Sicilian coasts is growing. The phenomenon has repercussions on the territory and diversified typology (competition on origin rights and fund utilization, rising irregular immigrants, "caporalato" and working, etc.).

Contrary to this, there is a welcome system and specific project initiatives are also being studied to counteract the emergence of phenomena of discrimination, racism, protest or civil indifference with the aim of finding solutions that contribute to the sustainable development of the territory. There is essentially a territorial vision and shared view of opportunities related to the presence of migrants that could be training in Sicily.

In this context, "Sicilia Integra" project proposal is developed, with a very deep humanitarian value that carries the principles of solidarity, democracy and pluralism; it focusing on training courses specifically targeted at young immigrants and at the same time young Sicilian unemployed people with

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training in agricultural sciences. The goal of the project is to prevent discomfort and to encourage the encounter, listening to each other, sharing and integrating through respect for cultural diversity and individual creativity. In this sense, this initiative constitutes a true "social innovation" in accordance with European policies aimed at protecting and promoting human rights and communities.

At the core of "Sicilia Integra" training course, organized through a participatory design process, the sustainability of organic and regenerative agrofood systems and agriculture as an integral part of the territory. This confirms the role that this sector plays in the economy and society in terms of positive externalities, that is, benefits to the industries and the community as a whole. Within the project, a methodology has been developed for problem solving and "cooperative learning", emphasizing the active involvement of immigrant students in group work and group success, methods widely used to improve preparation and education; furthermore the project will support the students in the acquisition of cognitive skills with the creation of an urban social garden.

The paper analyzes the activity carried out by the case study "Sicilia Integra", with the aim of assessing its ability to promote political and cultural changes towards the growth of a place of consciousness and active citizenship and the care of the rural area. Also the project will create a partnerships between students association and Sicilian organic companies.

2. Research objectives

The objectives of the paper are to evaluate the capacity of the "Sicilia Integra" model to produce on the territory:

- professional integration of migrants in urban agriculture;
- some short-medium term solutions to the economic and social problems of these subjects;
- an evolution of local food systems in a sustainable and supportive key, in line with the current principles of the civil economy and short-branch networks;
- the creation of inclusive communities, following the formation and implementation of local groups.

3. Research methodology

The evaluation of the performance of Sicilia Integra project was carried out with the help of the SWOT methodology, which, as is well known, is a widely used technique for territorial analyzes, the evaluation of regional programs (such as those developed in the EU Rural Development Policy) and strategic and operational marketing. Operatively, we first proceeded to collect all the information available about Sicilia Integra project through a specially prepared a general survey. Based on this information, a number of factors have been defined to describe the phenomenon investigated in a unitary manner both from the internal and external point of view and as a possible constituent factor. These exogenous and endogenous variables were collected within a new survey submitted to various public and private subjects involved in the participatory design process, followed by Sicilia Integra and similar initiatives, invited to participate in a focus group, in which they have met with great attention on the problems of the general political climate, the participatory design process, the project's operational performance, the project results, etc.

The invited experts were also asked to assign a score for each variable, ranging from 1 (= insignificant) to 5 (= very important), preceded by a + sign (= strength/opportunity), - (= weakness/Threat) and 0 (no weakness/no threat). To this end, a set of indicators contained within a questionnaire was provided to various stakeholders involved in the course design process, with the aim of collecting judgments and evaluations of the project, effects on the territory and about its future prospects.

4. Expected results

Sicily continues to be the target of an ever-growing flow of political and economic immigration, representing the Italian and European shores of the main Mediterranean destination. It results in political, economic and social problems that with modest means and resources the EU tries to deal with an immigration policy not yet fully defined in its content and purpose.

For these reasons it is important to promote legal employment as the most significant mechanism of integration in the local socio-economic system. In this context, Sicilia Integra's initiative tries to build, together with other similarities, an integration model at the center of which is the creation of a training process aimed at the creation of entrepreneurial skills, which are considered useful and prerequisites for an effective return policy. This initiative,

coming to the second implementation cycle, is well within the framework of the "social" role recognized in advanced agriculture countries in building a more inclusive, innovative and reflective Europe.

In the perspective, the relationship between social farming models and cross-border cooperation measures needs to be assessed in order to borrow positive experiences and effectively counteract the widespread illegality that revolves around this system. The results show, in fact, that farmers are positive as regards the contribution of immigrants to agriculture, albeit with "defensive" points of view towards a local multicultural society. Instead, immigrants denote a positive perception of their integration in host societies.

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DO RETAILERS' SPECIAL OFFERS INCREASE HOUSEHOLD FOOD WASTE?

by *Claudia Giordano*[*], *Luca Falasconi*[**], *Fabrizio Alboni*[***], *Matteo Boschini*[**] and *Andrea Segrè*[**]

1. Aim of the study

It is widely accepted that the largest proportion of food waste across the food supply chain occurs at the household level (Gustavsson et al., 2011; Bio Intelligence Service, 2010; FUSIONS, 2015). In addition, the recoverability of food waste appears to be lowest at the household level when compared to all other stages in the chain (Garrone et al., 2014), thus making the prevention of food waste especially necessary when this stage is considered (Magnussen & Refsgaard, 2009). For this reason, numerous studies have explored the relationships between several household behaviours and food waste production, with the goal of identifying the most important drivers of food waste.

In the existing scientific literature, there has been a major focus on the role of consumers in the production of food waste. Only recently has the idea of shared responsibility among producers, distributors and consumers been investigated; for example, the possible role of special offers at supermarkets, which may push consumers to over shop and hence result in food waste. A recent study conducted by Aschemann-Witzel et al. (2017) found that consumers who are more price-conscious while shopping exhibited lower levels of food waste at home, (Mallison, Russel and Barker, 2016), while WRAP (2012) suggested that price promotions are triggers of food waste.

The goal of the present preliminary analysis is to investigate the possible influence of special offers on consumer food waste production. If a positive relationship is confirmed, this would suggest that food stores (supermarkets,

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 ISBN 9788891786883

in this case), by attempting to get rid of food that likely would end up in their bins, move the food into householders' bins through the use of special offers.

2. Methodology

2.1. Definition, sampling and data analysis

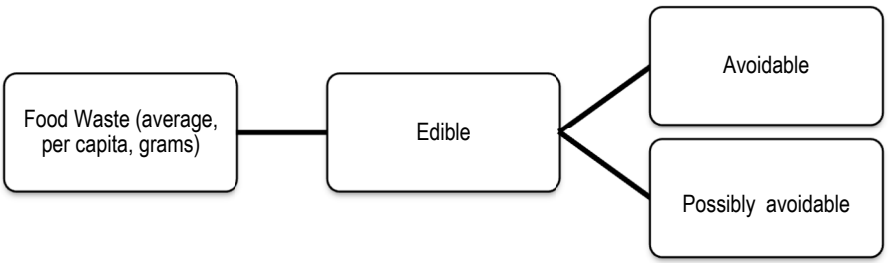
The present work outlines a preliminary analysis that was conducted on 75 out of 400 household units. The sample was randomly selected at the national level by SGW, a survey company with expertise on food waste. Data was collected through the use of diaries, to estimate quantities, and a questionnaire that comprised of two specific questions on participants' attitudes towards Discounted Food Products (DFP).

The finalized data set compared information collected through diaries and questionnaires based on the definitions of food waste outlined by FUSIONS and WRAP (for a detailed report on the differences between the two definitions, see Ostergen et al., 2014 and Stenmarck & Östergren, 2015). Below are important terms applicable to both definitions (WRAP, 2013):

- *Avoidable* food waste refers to food and drink thrown away because they are no longer wanted, for example because they rotted or exceeded their expiration date.
- *Possibly avoidable* food waste refers to food and drink that some people eat while others do not (e.g. apple peels), or that can be eaten when prepared in one way but not in another (e.g. potato or pumpkin skins).
- *Unavoidable* food waste comprises of waste created during food and drink preparation that is not and has never been edible under normal circumstances.

In the present paper, only the edible fraction of food waste, comprising of both avoidable and possibly avoidable food waste, was considered.

Fig. 1 – Definition of food waste chosen for the present study (starting from WRAP's definition, 2013).



Source: authors' elaboration.

Respondents were divided into two groups: Sub-sample A was made up of participants who indicated that they regularly purchase DFP, while Sub-sample B was made up of participants who indicated that they do not. Average per capita food waste for the two sub samples was compared. Statistical tests were conducted to test for significant differences in food waste between the two groups.

2.2. Tools

2.2.1. Diaries

Participants filled out diaries for one week, reporting on their grocery shopping as well as their food waste per meal per day. A page of the diary was reserved for an inspection of the fridge and pantry at the end of the week, in which participants were to record food that was bought during the week but not consumed, and that was no longer intended to be consumed. As in the pilot experiment (Giordano et al., 2016) and in previous studies that used the diary method (WRAP, 2012; Koivupuro, 2015) the food diary followed the structure below:

- What did you throw away?
- Why did you throw it away?
- How much of it did you throw away? (With estimation methods provided in the instructions).

The above open-ended questions were succeeded by two closed ended ones inquiring into:

- Method of disposal (mixed garbage, organic waste, sewer, given to pets, other) and;
- Type of product (frozen, canned, fresh, take away, home-made).

Food consumed away from home (e.g. in canteens, restaurants, etc.) was not considered, while food purchased and then consumed at home was. The latter included take away meals consumed at home. Food thrown away during the week and during the inspection of the fridge and pantry at the end of the week formed the two components of the average per capita food waste.

2.2.2. Questionnaire

In order to answer the study's main question, the average amount of edible household food waste on a per capita basis was compared based on responses provided to the following questions:

- Question 13: "Do you usually buy DFP?" (*Possible response*: *Yes or No*)
- Question 14A: "In the last three weeks, how often did you buy discounted food products that you ended up throwing away?" (*Possible responses* : *Always, Often, Sometimes, Never, or "Do not remember"*)

3. Expected Results

We expect a significant difference in food waste averages between the two sub samples, that is, those who indicated that they frequently purchase discounted products and those who indicated that they do not. Based on extant literature, the purchase of discounted food products can predict either of two opposing behaviours. On the one hand, the purchase of discounted food products can suggest higher price consciousness and shopping efficiency, resulting in less food waste. On the other hand, such purchases could simply represent impulsive responses to marketing tactics, which would result in increased food waste at home. The most recent study on this subject, specifically the study conducted by Aschemann-Witzel et al (2017), found support for the first hypothesis.

Finally, there is also the possibility that the purchase of DFP would be found to have no significant influence on household food waste quantities. Such a result would suggest that special offers cannot be considered as contributors to household food waste.

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OVER-NUTRITION: REVEALING THE DARK SIDE OF FOOD WASTE

by *Silvio Franco*[*] and *Clara Cicatiello*[**]

1. Background and objectives

In this study we address over-nutrition, i.e. the food consumed beyond an individual's needs, as a previously unexplored type of food waste. Although some authors (Smil, 2004 and Blair & Sobal, 2006 among the first ones) have argued this correspondence, the extent of over-nutrition as a form of food waste has never been assessed.

The aim of the paper is to attempt estimating the food waste embedded in the over-nutrition of the Italian populace.

To describe the connections between over-nutrition and food waste, we conducted a meta-analysis of the papers addressing the two issues together. Namely, we selected a set of articles where the terms "over-nutrition" (or similar, i.e. "overeating", "overconsumption") and "food waste" (or similar, i.e. "food loss") both appeared in the title, abstract or keywords, and/or the main references on the link between food waste and over-nutrition (Blair and Sobal, 2006; Smil, 2004) were cited.

The research was conducted using the Web of Science, Scopus and Google Scholar databases. The abstracts of the resulting articles were screened in order to select only those that actually addressed both the topics of over-nutrition and food waste. This selection produced a set of 19 articles that were carefully read and analysed.

The review suggested that if overeating is not classified as a type of food waste, it might be regarded as a possible way to reduce food waste (Ponis et al., 2017), therefore over-nutrition should be considered as a form of food waste.

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 ISBN 9788891786883

Following the results of the literature review, we set a methodology to estimate the extent of food waste due to over-nutrition in Italy.

2. Methodology

The methodological approach is based on the assumption that over-nutrition is the excess caloric intake required to keep overweight and obese people in their current condition. So, for our purpose, over-nutrition is not interpreted as the cause of excess weight, but rather as a consequence of it.

The object of the evaluation is, according with the definition of over-nutrition, the positive difference between the number of calories ingested and the recommended calorie intake (Lettenmeier et al., 2012; Chaboud & Daviron, 2017).

The evaluation process is divided into the four steps.

1. Estimation of the number of overweight (25<BMI<30) and obese (BMI>30) Italian people by gender and age class (ISTAT, 2015).
2. Calculation of the individual daily energy requirement (ER) by gender, age class and BMI level (normal weight, overweight, obese). The ER value is the product of the basal metabolic rate (BMR) and the physical activity level (PAL) (Bender, 1994; FAO/WHO/UNU, 2004). BMR is the minimum amount of energy required to maintain life functions, which depends on weight, age, and gender (FAO/WHO/UNU, 2004; Schofield, 1984). The Harris-Benedict equation (Harris e Benedict, 1919; Garrel et al., 1996) was used to predict BMR in terms of kcal/day.
3. Comparison of the ER of overweight and obese individuals with the corresponding ER of normal-weight individuals to estimate the individual daily caloric surplus required by overweight and obese people. The results were used to estimate the total over-nutrition of overweight and obese people in Italy.
4. Conversion of the excess calories intake required by overweight and obese people into a quantity of food. To this purpose, a typical Italian diet has been defined. The ratio between the weight of the food ingested in a day (1,867 g) and its caloric content (2,185 kcal) defines a coefficient that allows us to convert the over-nutrition into food quantities (0.85 g/kcal).

3. Results

ISTAT data were used to assess the condition of the adult Italian overweight and obese population. To calculate the daily ER for normal weight, overweight and obese individuals by gender and age category, we estimated the coefficients of the BMR equation, basing on two assumptions: (i) BMI distribution curves were supposed to be normally distributed; (ii) the average height and weight for each age category were obtained using the inverse BMI formula, on the basis of data on the average height of Italians over the last century (NCD-RisC, 2017):

The BMR values were corrected applying a PAL coefficient based on a progressive reduction in the level of lifestyle activity from younger (moderate/light) to older (sedentary) age groups.

Then, the daily caloric excess for males and females was calculated by age category for overweight and obese individuals, and these data were aggregated to assess the total number of calories representing the over-nutrition of the Italian populace in a year (Table 1).

Table 1 – Total over-nutrition of overweight and obese Italians (million kcal/year)

	Males	Females	Total
Obese	573,088	351,166	924,254
Overweight	1,198,921	547,003	1,745,924
Total	1,772,009	898,169	2,670,178

Source: our elaboration

The results show that the total number of calories wasted due to the over-nutrition of overweight and obese Italians is about 2.67 trillion kcal per year. This figure, translated into food quantity by means of the conversion coefficient (0.85 g/kcal), corresponds to about 2.3 million tons of wasted food per year. If we downscale this figure to the individual level, the amount of food wasted on average by each Italian due to over-nutrition can be estimated as 37.7 kg/person/year.

This last value is comparable with the figure of household food waste as estimated in literature as a benchmark. Indeed, considering three recent studies, household food waste per capita has been assessed as, 75 kg/year (WRAP, 2013), 32 kg/year (Edjabou et al., 2015), and 23 kg/year (Silvennoinen et al., 2014). So, as stated by Alexander et al. (2017): "*system losses from overconsumption of food are at least as substantial as the losses from*

food discarded by consumers and therefore have comparable food security and sustainability implications".

4. Conclusions

In this study, we argue that food waste and obesity are closely linked, by calculating the waste of food corresponding to over-nutrition.

Through a meta-analysis of the relevant literature, we have shown that scholars are increasingly recognizing over-nutrition as a form of food waste that, just as the other forms of food waste, has significant environmental and social impacts. Including over-nutrition in the definition and estimation of food waste affects the whole concept of food waste. Indeed, food waste is no longer considered as "food that is not eaten", but rather as food that does not contribute to proper nutrition and, therefore, to the well-being of individuals and the community as a whole.

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FOOD WASTE: A SURVEY ABOUT CONSUMERS AND THEIR ATTITUDES

by *Emilio De Meo*[*], *Fabrizio Baldassarre*[**] and *Raffaele Campo*[***]

1. Objectives and literature

This study is aimed at highlighting the phenomenon of food waste. The objectives of this study are, in particular, to describe (through a literature review) the data of this phenomenon and its consequences in the whole food chain. Secondly, we want to highlight the role of consumers, in order to have also a marketing perspective.

The first part of this research has been focused on a review of scientific literature. Ponis et al. (2017) investigated the effects of the business habits of 500 Greek families, They found no link between shopping habits and food waste, showing on the contrary an association between eating preferences and wasting; moreover according to their research people who shop in a more frivolous way tend to throw away more food. Campoy-Munoz et al. (2017) recently assessed the economic impact of reducing food waste in Germany, Spain and Poland through social accounting matrices., showing how food waste reduction has a different impact considering the different economic structure of a country. Eriksson et al. (2017) focused on Sweden: they have quantified food waste in public catering services in a Swedish municipality. Tostivint C. et al. (2017) measured, in the milk sector in Pakistan, the main methodological principles of the Global Food Loss & Waste (FLW) protocol, highlighting a waste of 1.4 % in the whole chain. Another study focused on consumers and waste is that of Stefan et al. (2013), who found that

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planning and shopping routines predict food waste, for example moral attitudes are important to avoid this negative phenomenon; Graham Rowe, Jessop and Sparks (2014) showed four categories of barriers which minimize food waste, that are: 1) a good provider identity, 2) minimizing inconvenience, 3) lack of priority and 4) exemption from responsibility. It is important, furthermore, to cite Segrè as one of the most productive authors in Italy on this issue. In one of his book, published in 2010, he discusses about the social initiative "Last Minute Market".

2. Methodology

In the second part of this research we analyzed empirically this issue. In order to better comprehend the way consumers approach to the food waste issue, a survey has been organized. From this point of view a questionnaire has been administered via online to a sample of consumers (127). It is necessary to underline that this is an ongoing research, for this reason data have to be considered partial, especially because the sample needs to be enlarged. This questionnaire is mainly composed by closed-ended and Likert scale questions (from 1 to 5), and it is organized in way of understanding the consumers' conception of food waste and their daily habits in terms of food use and eventually its storage/waste. As regards the composition of the sample, 75.6% are females, 24.4% males; the prevalent age group is that of 51-60 years old consumers, followed by 41-50 (26.8 %), 21-30 (17.3%), 31-40 (15.7%) and finally 18-20 and 61-70, both of which with a percentage of 6.3%. Most of the sample (57.5%) owns a Master of Science, 18.9% a PhD, 15.7% a high school diploma, 7.1% a Bachelor of Science and, finally, 0.8% a middle school diploma. Professionally 63% is employee, 14.2 % student, 10.2% freelance, 5.5% does not have a permanent employment, 4.7% is unemployed and 2.4% is retired. Finally the family income: 37.8% belongs to the 15,000-30,000 euros bracket; 19.7% to the 30,001-45,000 one; 18.1% has an income between 0 and 15,000 euros; 12.6% between 45,001 and 60,000 euros; 6.3% between 60,001 and 75,000 and 5.5% has an income higher than 75,000 euros.

3. Findings

This analysis highlights that consumers tend to pay enough attention to avoid food waste, at least considering what they declare. Generally age and income influence little their attitudes, except for some behaviours such as throwing away fruits which are slightly damaged, throwing away opened

food packages even if correctly stored, avoiding to consume food whose expiration day is the current day, which are more common to 61-70 aged group as well as the richest one (family income higher than 75,000 euros /year): the same result has been found by McCarthy and Bo Liu (2017), according to which higher income consumer waste more food.People with lower income tend to rationalise their consumption because probably perceive better the scarcity of resources on this planet. Observing the concrete attitudes of the participants, it is evident that sometimes food is wasted, bread and fruit and vegetables, while they pay more attention to avoid pasta and rice waste. On average, however, all kind of food, from sweets to marine products are thrown away, even if sporadically. Finally this analysis plays up the positive correlation, even if often weak, among those variables considered for the study in particular between the attitude to correctly store food and the attention to consume what expires before; similarly a quite strong positive association has been observed between the items "I consume what expires before" and "I re use leftovers" as well as "I consume also recently expired food if they are acceptable in smell and taste" and "I would purchase food in damaged package only with a high discount". In the last question, moreover, participants were asked to choose between a package of pasta (price: 1 euro) and the same product in a damaged package (price: 0.20 cents): 76.4% of the sample declared to be open to prefer the low-cost version.

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COMBINING LIFE CYCLE ASSESSMENT AND COSTING FOR FOOD WASTE PREVENTION AND VALORIZATION

by *Fabio De Menna*[*], *Jennifer Davis*[**], *Karin Östergren*[***], *Nicole Unger*[***], *Marion Loubiere*[****] and *Matteo Vittuari*[*****]

1. Introduction

Global estimates (FAO 2011) suggest that about one third of edible food produced is lost or wasted along the supply chain. This inefficiency implies the wastage of natural resources as well as economic ones (e.g. FAO 2013, 2014, Kummu et al., 2012, Vittuari et al. 2016). Thus, food waste prevention and valorization routes are needed to reduce environmental and economic costs of food systems. However, to implement these strategies, the different outcomes and tradeoff need to be properly evaluated. Life cycle methodologies can be applied to analyze both the economic and environmental impacts of waste prevention, valorization, and management (ISO, 2006, Hunkeler et al., 2008, Corrado et al., 2017; Gruber et al., 2016; Notarnicola et al., 2016; Unger et al., 2016, De Menna et al. 2016). However, no systemic approach has been developed so far, the goal and scoping phase (e.g. problem assessed or system function) can be characterized by a large flexibility, and the comparability between FW scenarios could be not ensured. Therefore, a consistent and integrated life cycle approach is needed to generate reliable information for both individual stakeholders and policy makers. Within the H2020 project REFRESH (Resource Efficient Food and dRink for the Entire Supply cHain), this study aimed to provide practitioners with guidance on

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 ISBN 9788891786883

how to combine Life Cycle Assessment (LCA) and environmental Life Cycle Costing (E-LCC) in the context of food waste.

2. Materials and methods

Recent literature was reviewed to identify relevant methodological aspects related to LCA (Unger et al., 2016) and LCC (De Menna et al., 2016), possible commonly adopted approaches, main differences among studies and standards and protocols, main challenges and knowledge gaps. Basing on this review, an analytical framework and a set of recommendations were developed for different assessment situations. A specific framework was developed with the aim of providing a step by step assessment framework and guidance for food waste practitioners (Davis et al., 2017). The framework is composed of a preliminary section on study purpose definition, three decision trees - respectively on assessment situation(s), costing approach, and type of study (footprint vs. intervention) - and two sets of recommendations.

3. Results

Recommendations should apply to all levels of the food waste hierarchy stating a generic order of preference for handling food chain side flows, as suggested also by the EC directive on waste (EC, 2008, paragraph 4). The combined use of LCA and E-LCC approaches should ensure a better understanding of the impact of specific interventions, thus supporting informed decision making and promoting the design of sustainable and cost-efficient interventions and more resource efficient food supply chains. Finally, food loss and waste reduction present also relevant social (e.g. availability of food) and political implications that should be considered together with the results obtained from any LCA and E-LCC.

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USE OF THE ORGANIC FRACTION OF MUNICIPAL SOLID WASTE FOR THE PRODUCTION OF BIOPLASTICS FOR AGRICULTURAL USE: A SUPPLY CHAIN STUDY

by *Maurizio Prosperi*[*], *Roberta Sisto*[**] and *Mariarosaria Lombardi*[**]

1. Objectives

The amount of municipal solid waste and, consequently, its organic fraction, is continuously on the rise and increasing pressures exist to reduce the negative environmental impact deriving from its disposal. Therefore, the management of the Organic Fraction of Municipal Solid Waste (OFMSW) represents a relevant problem due to the serious consequences that its uncontrolled decomposition can cause to the environment and human health.

Currently, this fraction, if treated through a process of aerobic or anaerobic digestion, may produce a number of valuable commodities. Precisely, compost after the aerobic process and biogas (biofuels for heat and electricity generation and/or for the automotive sector) and digestate (soil amendment) after the anaerobic digestion.

The ongoing research is moving towards the usability of the organic fraction from municipal waste in order to produce biodegradable materials. For instance, in recent years, researchers at the University of Torino have shown that urban and agricultural wastes are sources of soluble bio-based substances (SBOs) (Scaringelli et al., 2016). Plastic materials containing SBOs are particularly suitable for the manufacture of films for agricultural soil mulching (Montoneri et al., 2011; Franzoso et al., 2015a).

Although the allocation of mulching films from SBOs is attractive for both commercial and sustainability issues, the supply chain structure is still undefined. As this represents an innovative semi-product, the aim of this

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 ISBN 9788891786883

study is to investigate its hypothetical supply chain, and to focus on obstacles and opportunities related to its development.

Through the theoretical framework of the supply chain analysis, the potential actors, their role and their relations will be identified.

2. Methodology

We set the investigation unit as the chain on its whole, defined through a downstream material flow approach, starting from the organic fraction of urban waste, to the production and use of biodegradable mulching film for agriculture. The domain of the analysis is constrained at national level, where the most relevant actors of the plastic industry operate.

We identify a supply chain made of six steps, namely: i) organic fraction of municipal waste, obtained from the separated collection of urban waste, ii) SBOs, obtained from the alkaline hydrolisis of digestate and/or compost, iii) bioplastic, produced by mixing SBOs with organic substances of the oil refinery, iv) biodegradable mulching films, obtained from the plastic extrusion, v) reels of mulching film, to be distributed to final users, vi) mulching practice (service) to farmer. At current time, the technology maturity varies along the chain, and this is the main cause of difficulty for the creation and the coordination of the value chain. As follows, we briefly provide an estimate of the technology maturity of the 6 steps, according to the Technology Readiness Level (TRL) method, which has been adopted by the NASA since 1974, and formally defined in 1989 (Mankins et al., 1995). According to this classification, TRL=1 mens that the innovation is still at the very early stage, while TRL=9 means that it is technologically mature, and already commercialized. In the case of the SBOs value chain there are the following differences in terms of TRL:

Step 1: the separation of municipal waste is currently operated widely at national level. TRL=9;

Step 2: the production of SBOs is still under development. There is a lot of literature on experimental methods (Montoneri et al., 2011; Franzoso et al., 2015a; Franzoso et al., 2015b), and the chemical characterization, therefore the knowledge is available to further proceed at demonstration level. TRL=6-7;

Step 3: the knowledge is still at laboratory level, while a lot of research is still to be done to find the methods to confer some specific properties to SBO bioplastics, which are needed by farmers (e.g. colour, resistance, elasticity, etc.). TRL=1;

Step 4: the same technology which is currently used to obtain conventional or biodegradable films. TRL=9;

Step 5: the distribution channels and methods are the same of conventional or biodegradable films. TRL=9;

Step 6: the service needed to spread the film over fields is currently available. TRL=9.

It is worth mentioning that the production of SBOs is still a not completely developed innovation, classifiable at TRL=6-7. This means that there are currently only projects running at demonstration level and not profitable for a private entrepreneur, facing all costs at price market. Therefore, further subsidies will still be needed. In addition, the use of SBOs during the polymerization of bioplastics is an innovation which is even less mature, with a TRL=1, requiring additional validation in a laboratory environment.

3. Expected results

The value chain analysis is aimed at the identification of relevant actors of the hypothetical chain. From this chain analysis, it is possible to identify the obstacles and opportunities related to the development of the agricultural mulching films using the organic fractions of the municipal solid wastes. This makes an important contribution to the sustainable waste management in the context of circular economy.

We are aware that it is a very ambitious study for many reasons. First, it is a very innovative research and, to the best of our knowledge, there are no other studies on this same topic. Second, if present, the supply chain of SBO from the organic fraction of Municipal Solid Waste could represent a pattern of sustainable economic development. Finally, the bio-plastics use in agriculture is a very relevant topic. In fact, analysts forecast global bioplastics market to grow at a Compound Annual Growth Rate (CAGR) of 29.3% during the period 2016-2020 (Sandler Research, 2016).

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UNDERSTANDING BIOMASS SUPPLY FOR A TERRITORIAL BIOREFINERY

by *Oriana Gava*[*], *Daniele Vergamini*[**], *Elena Favilli*[**], *Fabio Bartolini*[**] and *Gianluca Brunori*[**]

1. Introduction

Biorefineries are central in EU's strategy towards 2020. Biorefinery operators are willing to stipulate biomass procurement contracts with farmers, for securing continuous and optimal operations. Contract agreements are risk management tools (MacDonald et al., 2004), providing farmers with a fixed price for a given number of years. This study aims at identifying key contractual provisions that may encourage farmers to introduce some biomass cropping on farm, to support decision-makers when deciding on setting-up a territorial biorefinery. Those provisions are meant to be the elements of a menu of contracts (Moxey et al.,1999) that are attractive for arable farmers within 70 km from the prospected biorefinery's headquarter (Italian law DM 18-12-2008). The case study is the introduction of hemp cropping in Tuscany, a region that features large enough arable farming systems to sustain a biorefinery, via the introduction of a multi-purpose industrial crop, such as hemp. Hemp can be included in traditional rotations with cereal and fodder crops, thus offering farmers the opportunity to diversify their crop mix, raise farming profitability, and reduce uncertainty.

2. Methodology

The present research uses a principal-agent model to mitigate the inefficiencies of incentive design. Contractual agreements involve the principal

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 ISBN 9788891786883

delegating biomass cropping to as set of agents over a geographical area, to satisfy plant processing constraints. Adverse selection problems arise typically during contract negotiation, as the principal offers a contract to farmers of whom she cannot observe preferences, notably towards risk, opportunity cost, or minimum demand for compensation (Salanié, 2005). Farmers have informational advantage about farm's pedo-climatic conditions and in terms of agronomic knowledge (Alexander et al, 2012), which they can strategically use (Endres et al., 2013). Information advantage allows agents to get higher payments than the minimum that would be necessary for them to accept the contract (Ferraro, 2008), with obvious implications in terms of cost-effective planning of biomass supply. In case the principal can access information about farmers' production costs, she can use that information to design a menu of contract that matches the features of different cost-profile farmers, thereby reducing farmers' information rent and attracting more farmers over a wider area (first-best). When the principal cannot access that information, agents have an advantage, which they can use to extract information rents and participating to a contract tailored for different cost-profile farmers (second-best). Isolation strategies exist to let agents reveal their true cost profile, thus preventing the principal from paying them excessive information rents (Salanié, 2005). Screening, i.e. matching agents' profiles with a menu of targeted contracts, is probably the most efficient of those strategies (Endres et al., 2013). The menu of contracts (different payment levels over different cultivated areas for different agents' profiles) should allow agents' participation (incentive rationality constraint), while satisfying guaranteeing that an agent profile cannot be better off by choosing a contract designed for another profile (incentive compatibility constraint) (Laffont and Tirole, 1993; Ferraro, 2008).

Agents' profiles are approximated by representative farm types in the case study area. Farm types are built via cluster analysis over official data from the last Italian census of agriculture (2010). Agents' marginal costs for adopting biomass cropping are estimated using real world data, originating from an ongoing research project funded by the Rural Development Program of Tuscany 2014-2020. The project aims at creating a farm-to-gate supply chain for hemp-based products in Tuscany, including the construction of a territorial biorefinery.

Mathematical programming is used for finding a practical solution to the principal-agent problem (Viaggi et al., 2009). We assume that agents (farm types) can choose to allocate a minimum (δ) of 500 ha or 1000 ha UAA to biomass cropping. We also assume the existence of three levels of transaction costs, i.e. no (€0/ha), low (€25/ha), and high (50/ha) costs. The solution

of the principal-agent problem would help the principal to identify the incentive mechanism that maximises farmers' participation into the contract while minimizing principal's costs (Bartolini et al., 2005).

3. Results

Results a very sensitive to price changes, especially in the range €1.5-3/L hemp oil, where the utilised agricultural area converted to hemp cropping steeply increases from 90 to 3000 ha. The area under contract differs between first and second-best conditions, due to existing information asymmetry between the principal and the agents. Rent extraction by agents reduces the area and the number of farms involved into the contractual agreement. Under this condition, the principal would design a menu of contract to screen farms types and reduce their information rents. While the menu of contracts cannot completely avoid rent extraction by agents, it can reduce the extent of the rent that agents can extract by making a false statement about their cost-profile. The difference between cost curves under first and second-best conditions graphically exemplify that observation. First-best conditions allow the principal to have a larger procurement area to meet industry's demand. A risk averse principal would design the menu of contracts to secure the plant with a minimum procurement area to allow continuous and profitable plant operations or, like here, to allow biorefinery's start-up. This way the principal tries and reduce investment-risk. Contract design would then involve considering the transaction costs that are expected to arise from the negotiation. Just few farmers would find it profitable to introduce hemp within their crop mix, given the difference in production costs. Transaction cost turn to be a significant component of principal's profit function, thereby reducing the number of contracts that can potentially be stipulated. Larger farmer types seem to benefit more from contract participation, in terms of increased profit, by taking advantage of economies of scale and perhaps investing in additional facilities to pre-treat biomass, which would raise products' value added at the farm gate. Pre-treatment facilities would greatly improve seed loss and nutritional quality and carry out fibre first-step processing that facilitate the second step at the biorefinery level.

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THE CIRCULAR ECONOMY: A BROADER PERSPECTIVE FOR RURAL AREAS

by *Rosanna Salvia*[*], *Zacharoula S. Andreopoulou*[**] and *Giovanni Quaranta*[***]

1. Introduction

The concept of the circular economy came out of a growing economic and political consensus on the need to efficiently manage the finite resources that productive processes depend on in order to guarantee their long-term sustainability. The transition to a more circular economy is widely considered an important priority; it has garnered the attention of many international organisations and has also been included as an objective under the EU's regulatory framework (Murray, Skene and Haynes, 2017). The circular economy refers to an economic system, which breaks from the linearity of the "take-make-dispose" traditional growth model and, instead, promotes a regenerative system, which supports solutions designed to allow the flow of biological materials to be reintegrated into the bio-sphere, and technical materials to be recirculated without entering the bio-sphere. The circular economy, therefore, outlines a development strategy, which allows economic growth by optimising the use of natural resources, minimising environmental pressures, transforming supply chains and consumption patterns and redesigning production systems so that they are restorative or regenerative by intention and design (Ellen MacArthur Foundation, 2013) and is based on closing "resource-loops" in all economic activities (Hislop and Hill, 2011).

However, a real transition to a more circular economy requires systemic change and a holistic and integrated approach that takes into account the myriad of interconnections that exist within and between sectors and value

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 ISBN 9788891786883

chains and between local institutions and local economic and social actors. A systemic approach should, in fact, incorporate the social dimension, inherent to models of sustainable development, in the vision of a circular economy (Murray, Skene and Haynes, 2017).

Focusing on rural areas, we see that rural systems are facing a number of challenges to their long-term sustainability and they are showing contradictory pathways. Many rural areas of the world are facing the abandonment of agricultural activities while others are experiencing intensification of production (Keesde et al., 2017; Knickel et al., 2017; Salvia and Quaranta, 2015).

The aim of the paper is to reflect on the characteristics of a successful territorial model for a circular rural economy. The broader circular approach proposed requires a different interpretation of the "waste" products created by linear production processes; these could include abandoned rural areas and marginalised communities. Multi-level innovations aimed at redefining the processes and instruments for collective actions at a community level through rebuilding trust and strengthening community ties (Quaranta, Citro and Salvia, 2016) and at reshaping and implementing policies that are firmly place-based (Salvia and Quaranta, 2017) are required to build such a model. In this model, information systems can help in connecting the different parts of the system and also help in better connecting rural communities with the outside world (Andreopoulou, 2017, Misso and Andreopoulou, 2017, Quaranta and Salvia, 2017).

2. Methodology

The principle of resource circulation at the core of the circular economy concept can improve approaches to rural development, especially in its broader interpretation, and serve as a framework to build new policies or new policy instruments that are aimed at supporting innovative forms of development in rural areas.

Particular attention should be devoted to identify "wasted resources" in rural areas in order to regenerate and revalorize them.

In fact, processes of marginalisation in many rural areas are associated with a reduction in the quality and quantity of economic, social and environmental capital and, in many cases, with the loss, or "waste", of these capitals in valorisation processes. Taking natural capital as an example, we can see how in many rural areas the progressive process of marginalisation has led to land abandonment, with, among others, serious implications for biodiversity and ecosystem function; reduction of landscape heterogeneity and pro-

motion of vegetation homogenisation, loss of cultural and aesthetic values (Leal Filho et al., 2016).

In terms of human and social capital, the incapacity of many rural systems to generate adequate job opportunities results in the production of more "waste", by fuelling higher rates of outmigration, especially among the younger generation who are often the most highly educated and economically and socially active members of the population (Bock, 2016). Reduced human capital also risks weakening communities' political and socio economic power when out-migration flows are accompanied by a loss of cultural capital and an erosion of community ties which, in the long term, can prohibit the community's ability to act and regenerate (Bock, 2016; Quaranta, Citro and Salvia, 2016).

In terms of economic capital, the current model of development and the restructuring measures put in place post the 2007 financial crisis, have resulted in a loss of competitiveness and, consequently, have forced small firms, typically labour-intensive craft businesses, out of the market (Bock, 2016).

3. Expected results

In recent years there have been encouraging signs that Italy is moving towards a more "circular" vision of rural development. Among them are the National Strategy for Inland Areas, promoted by the Ministry of Territorial Cohesion, the establishment of law to set-up land banks, and, finally, the creation of innovation hubs in rural areas. In all of these schemes technology plays a fundamental role but, equally important, is the fact that they all start from the premise that the "waste" products from the previous linear approach to rural development must be re-introduced to form an integral part of the new "circular" economy model. This paper proposes that a greater focus on applying the concepts of circularity could hold the key to restructuring, rethinking and operationalising rural areas. Especially if the two "revolutionary" elements of the circular economy are given centre stage; regeneration and the transformation of production and consumption patterns. The paper also highlights the crucial role of technology in these processes.

However, to prevent this new approach from simply being accommodated inside the already consolidated regime, it is essential that the objectives of the circularity concept be clearly set out as the driving force behind all approaches to the rural economy, and that the introduction of innovation be entirely embraced so as to allow for real system change and not just efficiency savings for the processes and structures of the existing system.

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OPPORTUNITIES FOR AGRICULTURE TO MEET THE ENERGY NEEDS OF RURAL COMMUNITY: A PRELIMINARY STUDY ON THE FEASIBILITY OF SMALL-SCALE BIOMASS HEATING SYSTEMS IN THE MONTI DAUNI SETTENTRIONALI AREA

by *Maurizio Prosperi*[*], *Tommaso Albano*[**]
and *Antonio Lopolito*[***]

1. Objectives

The proposal provides a preliminary ex-ante assessment of the economic relevance of a small-scale bioenergy system aimed at satisfying the thermal energy needs of rural communities, through the valorisation of agricultural residues, such as cereal straws and tree pruning. The assessment is referred to the adoption of a circular economic approach, called bio-energy village, consisting in the modelling of a short-value chain, formed by three players: *i*) farmers (providing the residual biomass), *ii*) a cooperative formed by farmers and residents (running the energy converting facility), and *iii*) consumers (purchasing the thermal energy).

Apparently, the expected outcomes of a single bio-energy system are limited, either in terms of economic profitability (e.g. value added per inhabitant) or in terms of social impacts (e.g. new jobs) (Bonari et al., 2009). However, the relative simplicity of small-scale plants may favourite its rapid diffusion on a group of municipalities in rural areas, leading to a highly relevant impact.

The basic idea behind the present paper is that the replication of small-scale energy plants may determine a relevant impact in large areas, enabling the engagement of the local communities since the early beginning of the project definition, through the realisation and management at regime (Lopolito et al., 2015).

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2. Methodology

The reference model is represented by the German bioenergy village (Bohnet, 2013), which is founded on the following four concepts: *a*) small distance among farmers and local households; *b*) energy production devoted to local consumption; *c*) local community ownership of the energy facility; *d*) high site-specificity of the project (i.e. idiosyncrasy). The model is applied to 13 municipalities located in the *Monti Dauni Settentrionali* area (Province of Foggia, southern of Italy) for a comparative purpose (Albano, 2016). The assumption underlying this study is that each municipality operates an independent supply chain enabling the exploitation of the local agricultural biomass to fulfil the needs of the community (Prosperi and Scaringelli, 2015). The analysis consists of the following steps:

I. design of the small scale bioenergy system, with the specification of biomass source, technology for energy conversion, energy distribution;

II. identification of the potential biomass availability (by using data of the 2010 Agricultural Census - ISTAT, 2010);

III. identification of the potential thermal energy needs (by using demographic and economic data);

IV. optimization of the bioenergy system, for each municipality (by using a linear programming model, designed for the GAMS software);

V. calculation of socio-economic benefits.

The formal specification of the model is the following:

$$Max\ VA = \Sigma_m \{\Sigma_i\ (\Sigma_j\ x_{i,j,m})\ q_i\ p_i - \Sigma_z (\ c_{i,z}\ v_{i,z}\ )\} \quad (1)$$

s.t.:

$\Sigma_i\ (x_{i,j,m}\ \ t_{m,i}\ ) \leq T_{m,j}$: biomass availability necessary to the energy conversion of the x_i type of energy, constrained by the overall quantity provided by farmland T in each municipality m;

$\Sigma_i\ (x_{i,j,m}\ \ k_{m,i}\ ) \leq K_{m,j}$: financial capital necessary to collection, storage, convert the x_i type of energy, constrained by the overall availability K in each municipality m;

$\Sigma_i\ (x_{i,j,m}\ \ l_{m,i}\ ) \leq L_{m,j}$: labour necessary to collection, storage, convert the x_i type of energy, constrained by the overall availability K in each municipality m;

$(\Sigma_j\ \ x_{i,j,m}\ \ q_i\ ) \leq D_{m,i}$: quantity of energy produced and sold to local market, should be lower than the energy needs of the community in each municipality m;

where:
$x_{i,j,m}$: energy produced from the biomass i and technology j at municipality m;
$t_{s,i}$: biomass quantity to be converted;
$T_{s,j}$: total farmland availability (hectares), for the biomass i ;
q_i , p_i : yield (tons) and market price (Eur), of the produce of the i type of energy;
$c_{i,z}$, $v_{i,z}$: amount of the z variable technical input (or services) purchased in the market, its related market price (Eur), excluded those provided by the actors included in the bioenergy village.

3. Expected results

The study provides preliminary information on the potential benefits from the application of the circular economy to satisfy the thermal energy needs of rural communities, through the valorisation of agricultural residues. The impacts of the hypothetical energy supply chain are evaluated in terms of: value added produced, new job creation, and fossil fuel replacement.

This information is aimed at supporting and stimulating the political debate needed to favourite the social acceptance of the novel approach of bioenergy village at community level (i.e. to prevent the NIMBY syndrome), and to promote the convergence of expectations among the relevant players, actively committed in the creation of the supply chain (Lopolito et al., 2015).

The preliminary results obtained demonstrated that the bioenergy village model has a great potential for the development of the area analysed. A striking result is the potential for the added value increase, that is around 3 million EUR. These figures are meant to convey the important message to ground debates among residents and stakeholders that a mutual collaboration may be beneficial for both parties.

The study confirms that the shift from fossil fuel economy to green economy is feasible, it is coherent with the the bio-based economy, and it may couple environmental objectives with rural development challenges. This is in line with the major policy stream at local and supranational level, such as the current "Europe 2020" EU strategy, which focuses on employment and sustainable growth goals, while pursuing the development of a green, competitive, and resource-efficient economy.

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"ENHANCED" CERTIFICATION FOR ORGANIC PRODUCTS

by *Sabrina Giuca*[*]

1. Introduction

The increasing organic products demand is linked to the new trends and food consumption behavior with an higher orientation towards sustainability (Batte et al., 2007; Tait et al., 2011; Abitabile et al., 2015) and with the demand of additional features in terms of environmental, economic and social assets (Madau and Viganò, 2016).

Several European organic farmers are moving towards the adoption of techniques and practices in line with the agro-ecological approach (crop diversification, mixed farming systems, ecological infrastructures) and parameters related to product quality and the environment. This is achieved through the adherence to collective brands of private associations representing producers, processors of products, organic distributors with production standards codified in their regulations which have a minimal impact on the ecosystem and through the attention on ethical and social aspects.

As known, organic foods have a high degree of informational asymmetry (Akerlof, 1970) as they are "credence" product, with specific production and of processing requirements that the consumer can not verify during the buying process or after consumption (Jahn et. al., 2005).

The success of organic products "enhanced" by the collective trademarks also depends, and above all, on the level of consumer confidence in the trademark certification system by a third body, which can significantly reduce the asymmetry of producer-consumer (Albersmeier et al., 2010).

This paper illustrates the characteristics of four private collective trademarks born, in chronological order, and respectively in Switzerland, Sweden,

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Italy and France, according to a technical analysis which can be translated into a cognitive tool of these initiatives[1].

This cases, although not exhaustive of "enhanced" certification of organic products initiatives, can offer interesting reflections on the topic, in terms of creating economic and cognitive relationships all along the chain to the market.

They ensure on the one hand an adequate level of income for producers and of an environmentally friendly production-processing-distribution methods and socially equitable and sustainable processes, and, on the other hand, an information flow to communicate to consumers the added value of this kind of certifications.

2. Method

The supply of organic products, especially in mature markets where spreading in conventional trade circuits compromises the value of an alternative production model (Fonte and Agostino, 2008; Abitabile, 2016) is therefore adapting to consumers which tend to be more attentive, sensitive and that decide to choose organic products as they respond to multiple needs.

To this end, organic products operators certified by the control bodies can voluntarily adhere to private collective trademarks with standards that respect environmental sustainability requirements such as the conservation of natural resources (presence in ecological ecosystems) and the reduction of environmental protection, atmospheric, water and soil pollution and/or ethical and social aspects.

An exploratory inquiry was conducted with the aim of understanding the phenomenon, by selecting and studying documentation, that has led to deepening some European best practices of certifications with the concerned added value ("plus"), or collective trademarks of private associations whose specifications provide for additional and restrictive requirements with respect to products certified with the EU organic logo[2], aimed at social welfare and reducing the negative externalities of their activity.

This survey covered the following labels trademark: "Bud" in Switzerland (it has adopted EU organic legislation although is not part of the EU), "Krav" in Sweden, "Garanzia Aiab" in Italy and "Bio Cohérence" in France.

[1] The survey was developed within the project "International Organic Farming Projection (BioFrontiere)" funded by Mipaaf and co-ordinated by CREA-Research Centre for Agricultural Policies and Bioeconomy.

[2] If used on a product, the EU organic logo indicates that this product can be legally qualified organic because it is in full conformity with the conditions and regulations for the organic farming sector established by the EU.

3. Results

The guarantees offered by the analyzed collective trademarks include compliance with commitments that go beyond those established by EU standards and the legislation in their respective countries: conservation of resources and protection of biodiversity, the use of renewable resources, animal welfare, ethics and social responsibility, respectful labor directives and fair trade relations throughout the chain.

Common principles for the four collective trademarks are: farms wholly conducted with organic methods; animals fed with organic fodder produced predominantly in the farm and related to the species, housed in structures meeting their physiological and behavioral needs, with wide open spaces; zero tolerance for genetically modified organisms (against 0.9% for the EU organic label) at any level of the production process; processed products containing only organic ingredients (while the EU organic label admits that 5% of the ingredients are not organic) and only natural substances; eco-friendly packaging; strict checks carried out by third bodies. In addition, the analyzed collective trademarks, often reinforce local-biological equivalence; for example, authorize, in the processing, only the use of raw materials coming from national borders and/or foresee the use of differentiated logos based on the percentage of ingredients of foreign origin used.

The function of the trademarks is to ensure the presence of certain qualitative features linked to additional and restrictive requirements of the organic production method and to transfer such information. This is functional for consumer needs – as it reduces informational asymmetry, costs linked to the choices and protects consumers against fraud by guaranteeing a minimum "quality" (Cooter et al., 1999) – as well as for the competitive strategies of the producers/processors, as they are encouraged to cooperate to increase the quality of the attributes.

4. Conclusions

The strengths of the "enhanced" organic products certification concern the organic products supply chain with a collective trademarks (producers/processors/trademark licensed distributors), in coherence with a shared strategy aiming at a continuous improvement, are linked to the positive impact related to the logo and, therefore, in the positioning of the collective trademark on the market as well as in the benefits on business management on process control plan, safety and quality (Giuca, 2014).

In the internationalization process of companies, enhanced certifications are increasingly becoming an important qualification representing a "business card" for mature markets, responding to the challenges of competitors and address organic products consumers more sensitive. The adoption of these private collective trademarks, based on sustainability elements of the product and process, thus creating added value to the product, is the optimal solution for creating pricing mechanisms for organic products chains more virtuous, both on the side of consumers who would direct their choices by preferring the products they adopt to these trademarks and the institutions, which could recognize a "plus" for these elements and in particular the constraints to resource conservation.

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THE SOPHISTICATION OF IMPORTS AND THE NATURE OF COMPETITION IN THE DESTINATION MARKETS. THE CASE OF AGRI-FOOD TRADE

by *Anna Carbone*[*] and *Roberto Henke*[**]

1. Introduction

The concept of *sophistication* sums up the content of a good in terms of technology, design, quality, branding, scale economies (and consequent market power of the seller) and any other factor affecting its final value (Krugman, 1980; Helpmann, 1981; Schott, 2004; Fabrizio et al., 2007; Rodrik, 2006; Lall et al., 2006; Carbone and Henke, 2012; Carbone et al., 2015). The sophistication level of an imported good describes the kind of competition and the level of remuneration it meets in world markets. (). In this work the analysis of sophistication is focused on imports, assuming there is also a relationship between the level of per-capita income of an importing country and the level of sophistication of its agri-food imports[1]. The measure proposed assumes that the level of sophistication of the destination markets is key in determining the kind of competition engaged by exporters and thus in displaying their competitive advantages. The paper also explores a country-specific measure of sophistication that allows to compare the position of a selected group of countries that export the same item to the international markets and, thus, are potential competitors. The selected items include both agricultural produce and processed food: olive oils, citrus, fresh vegetables, peeled tomatoes and bakery products.

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[1] The idea is not entirely new, since other works have dealt with different versions of the sophistication concept, included a look at the import side (Marvasi, 2012). However, both the indices and the focus of this analysis are different as the focus here is totally put on imports flows.

2. Trade sophistication indices

Recent studies have associated the concept of sophistication to the level of prosperity of the exporting Countries (Lall et al., 2006; Hausmann et al., 2007).

Here we look at the sophistication associated to imports rather than to exports, based on the following considerations: i) destination markets are the actual competitive arena that products are going to meet, so that focusing on these is worth when the interest of the analysis is more on the competitive conditions relevant to the products rather than on the growth effects of exports; ii) focusing on imports narrows the identification of the relevant markets and, thus, allows a more accurate analysis; iii) looking at the destination markets, rather than the markets of origin, reduces significantly the influence of localisation factors other than GDPpc.

The Consy for any imported good i is defined as:

$Consy_i = \Sigma_j GDPpc_j * c_{ij}$

where GDPpc $_j$ is the per-capita income of importing country j and c_{ij} is the share of total world imports of item i imported by country j:

$M_{i,j} / M_i$

where M are imports and I and j are the same as above.

The higher is the role of high-income countries in the imports of a good the more sophisticated is the product. In other words, the income level of the destination markets for a product indicates the kind of competition that the product would likely meet. This index works very well also in order to measure the sophistication level of a sub-group of importing countries (C-$Consy_i$). This version of the index includes only imports realised by the clients of the single country C and allows comparing different countries competing on destination markets for the same category of exports.

3. The sophistication of import markets

Figure 1 shows the values of the Consy index calculated for the agri-food traded items for average years 2003-04 and 2013-14. Imported items are concentrated in the upper right hand of the graph. Consy values span approximately from 16,600 to 43,000 US Dollars (USD) (associated, respectively, to durum wheat and to small berries), with an average of about 34,000 USD and an even higher median of about 35,000 Dollars. The 92 items displayed in the figure have been grouped in 4 categories: 1) agricultural commodities and raw materials purchased by the food industry and utilised as inputs for processing food; 2) semi-processed products, barely differentiated and used

as inputs by the food industry for further processing; 3) fresh agricultural products and perishable goods requiring complex logistics; 4) higher value added, processed and differentiated goods for final consumption. All the items displayed in Figure 1 have been labelled according to the group they have been assigned. The average Consy values for each group are also displayed (labelled in the figure as M1, M2, M3 and M4).

The graph shows that items in groups 1 and 2 are associated with lower Consy values with respect to group 3 and 4. Also, the average group values confirm the different sophistication level of the groups, with the differences that are statistically significant (as evidenced by the *test-t* at 1%).

Fig. 1 – The sophistication of imports and its changes in time

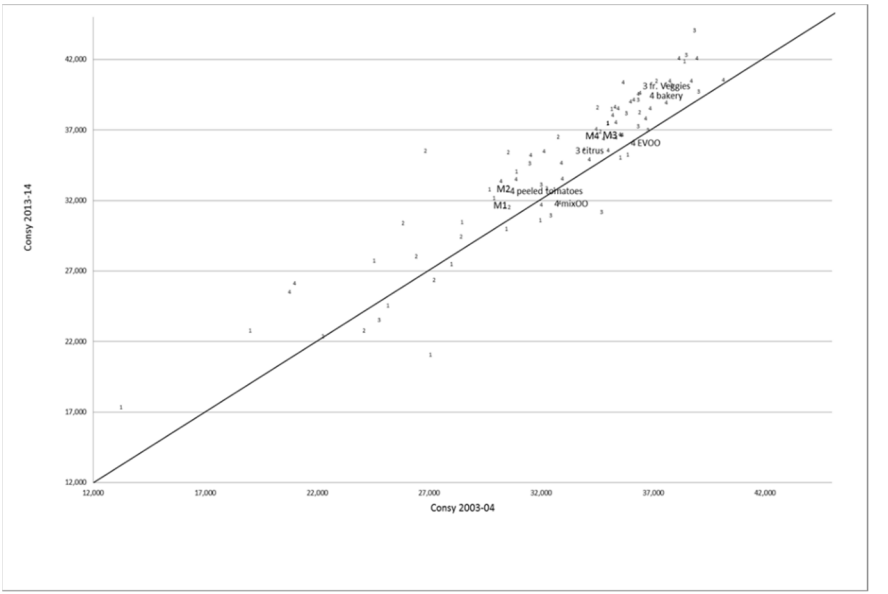


Figure 1 compares the Consy values at 2003-04 with those at 2013-14. Traded items whose Consy falls under the bisector faces a reduction in the sophistication level of their imports (i.e. less reach countries increase their role as importers and/or more reach countries become less important importers), and vice-versa. the sophistication of imports has not changed much in the period considered: only few imported items lie far from the bisector, indicating that the majority of the agri-food products has not incurred in relevant changes in the index values (R^2=0.8525). However, a general upward shift can be observed, indicating that richer countries are gaining role as importers of agri-

food products and, thus, that we shall expect a move towards higher sophistication level in demanded goods in international markets.

Figure 1 also focuses on few selected items that are relevant for the Italian agri-food trade and on which the analysis will pay further attention in the following pages. These are: *peeled and preserved tomatoes*, *fresh vegetables*, *citrus*, *extra-virgin olive oil* (*Evoo*), *mixed olive oils* (*Mixoo*) and *bakery products*. Among these, *fresh vegetables* and *bakery products* are the most sophisticated and the ones whose sophistication increase more. *Citrus* and *Evoo* imports are less sophisticated that the previous, however, while the Consy index for *citrus* slightly increases, the one associated to *Evoo* slightly worsen in the period. A similar result holds for *Mixoo* that is, however, located below in the graph. Canned tomatoes have a similar Consy value than *Mixoo* but their dynamics is opposite as there is a small increase in the sophistication value of their imports.

Moving to the C-Consy, this is referred only to the imports made by the clients of a group of exporting countries and for the selected traded items. In figure 2 each of the product-specific graphs shows the C-Consy associated to one traded item. The selected countries are all Mediterranean and are commonly considered as potential competitors for Italian agri-food exports.

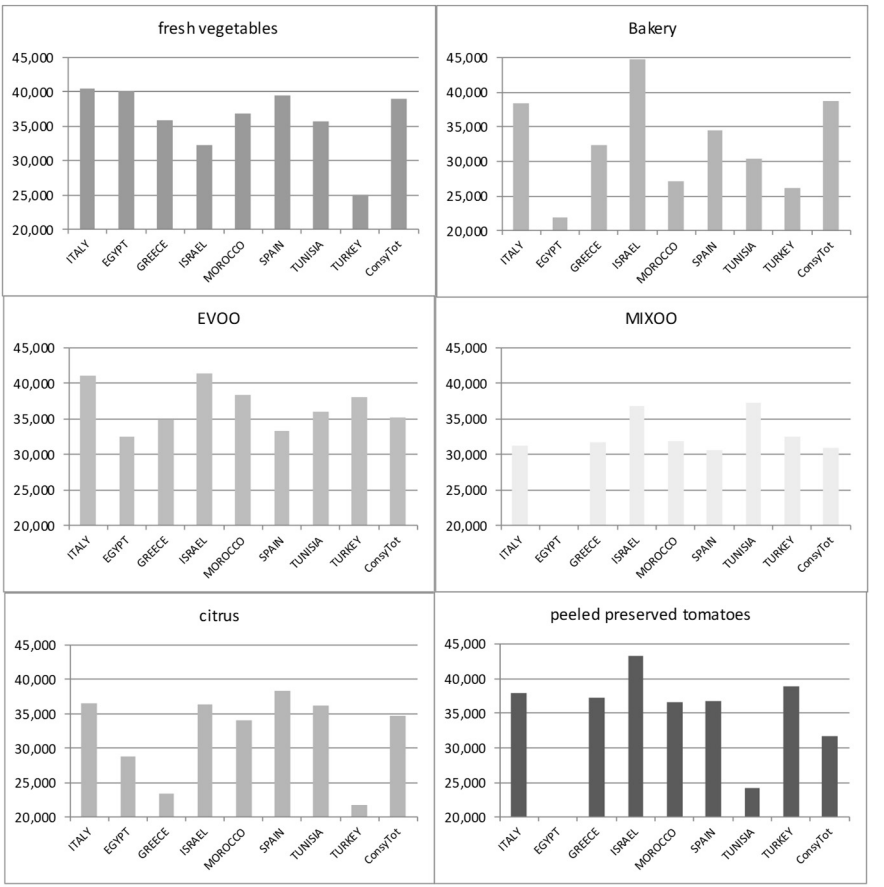
With regards to *fresh vegetables*, the graph shows that Italy, Egypt and Spain are leading the ranking with values of C-Consy that are higher than both those of the other exporting countries in the area and the aggregate Consy. In other words, these countries are able to sell their fresh vegetables to richer clients and, thus, potentially enjoying both higher willingness to pay from consumers and higher value added. Turkey is at the bottom of the ranking with rather lower values of its C-Consy, indicating that its exports are sold in much poorer and less rewarding markets.

Quite different is the case of *bakery products*. For these items the focus countries are competing in relative poorer markets. Italy and Israel are the only exporters able to engage a more sophisticated kind of competition, following global trends. Spain and Greece occupy intermediate positions, while all the North African countries are selling on markets where the competition is likely to be basically price competition.

The C-Consy analysis highlights the role of the Mediterranean countries in the international trade of olive oils. In this case many of them are able to compete on the sophistication ground as they are selling their exports to rich countries. In the *Evoo* markets many countries in the group - Italy, Israel, Morocco, Turkey and Tunisia - are selling to countries whose sophistication is above the world market average. Almost all the C-Consy for the *Mixoo*

are, not surprisingly, lower than those of the *Evoo* with the only exception of Tunisia that sells its *Mixoo* to richer countries that those who buy its *Evoo*.

Fig. 2 – C-Consy 2013-14: comparing client markets of different exporters on selected



Coming to the case of *citrus*, the graph shows a significant overall variability in the sophistication levels of the destination markets for the different exporters. Spain sells its citrus to more sophisticated clients than any other Mediterranean competitor. Among these, Italy, Tunisia and Israel are still above the world average value, while Morocco is slightly below the average and Egypt, Greece and Turkey have much lower C-Consy values for *citrus*, indicating that the kind of competition the face in their clients markets is radically different.

Lastly, looking at the case of *peeled and preserved tomatoes* we find that the Mediterranean countries are positioned well above the world average sophistication level with the only exceptions of Tunisia and Egypt that are far below. Israel is leading the ranking while Turkey, Italy Spain, Greece and Morocco are following, all very close one to the others.

4. Concluding Remarks

This paper introduces a new index in the literature called Consy. Here, the Consy is applied to agri-food imports. The analysis of the sophistication of agro-food imports contribute to understanding and interpreting the kind of competition that countries engage on international markets.

The analysis confirms that richer countries play a major role as importers of agri-food products. In particular, their role increases when importing high value sophisticated goods.

Moreover, the distribution of the Consy index for the whole set of agri-food trade shows that agricultural commodities and semi-processed inputs are basically bought by poorer countries, while goods for final consumption – both fresh and processed – with complex logistics, highly differentiated technology, quality, branding and so forth, are mainly bought by richer countries.

The trend of the Consy index reveals no huge changes in the analysed period (2003/04-2013/14), except for a few specific goods. However, for goods with a low Consy it is more frequent to observe reductions in the values, while goods associated to higher Consy values manage to improve their ranking over the decade. This seems to indicate that there are two opposite development patterns in international agri-food markets: one where sophistication is increasingly important and that reveals interesting remuneration to those exporters that can compete on this ground; the other basically featured by increasing price competition, with lower willingness to pay of poorer consumers and lower margins for exporters.

The C-Consy index was used in order to compare the destination markets of a number of potentially competing countries. Results showed that for *citrus*, *peeled tomatoes* and *Mixoo* there, actually, is space for direct competition as destination markets are similar and possibly overlapping. On the contrary, for the other products the destination markets are at different levels of sophistication and seem not to pose in direct competition imports from the focus countries.

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VALUE FORMATION IN ORGANIC SUPPLY CHAINS: RESULTS FROM CASE STUDIES FOR APPLES AND PASTA IN ITALY

by *Francesco Solfanelli*[*], *Danilo Gambelli*[**], *Daniela Vairo*[**] and *Raffaele Zanoli*[**]

1. Introduction

Organic farming in Italy has been growing steadily over the last decades (Willer and Lernoud 2016), with about 1,5 millions of hectares in 2015 and nearly 60.000 operators (SINAB, 2016). On the demand side, data available from ASSOBIO (2016) confirm the constant and positive trend of the sales of organic products in the supermarket, that are worth about 1 million of euros in 2016. However, the Italian organic sector is faced today with a challenging issue, which stands in the capability of the supply chain actors to increase their added value along the chain (Sanders et al., 2016). While some studies consider supply chains for organic products in terms of type of sale channel, or relationships among supply chain actors (see Ilbery and Maye, 2006; Naspetti et al, 2011; Sonnino and Marsden, 2006), no study provides a comparative measurement of added value for specific organic products in different supply chains. The present study aims at providing an insight on the creation and distribution of added value for organic products in Italy, considering two products with an established Italian leadership in the organic market both at national and international level: organic pasta from durum wheat and fresh apples. For both products, we consider price formation and added value distribution along the supply chain.

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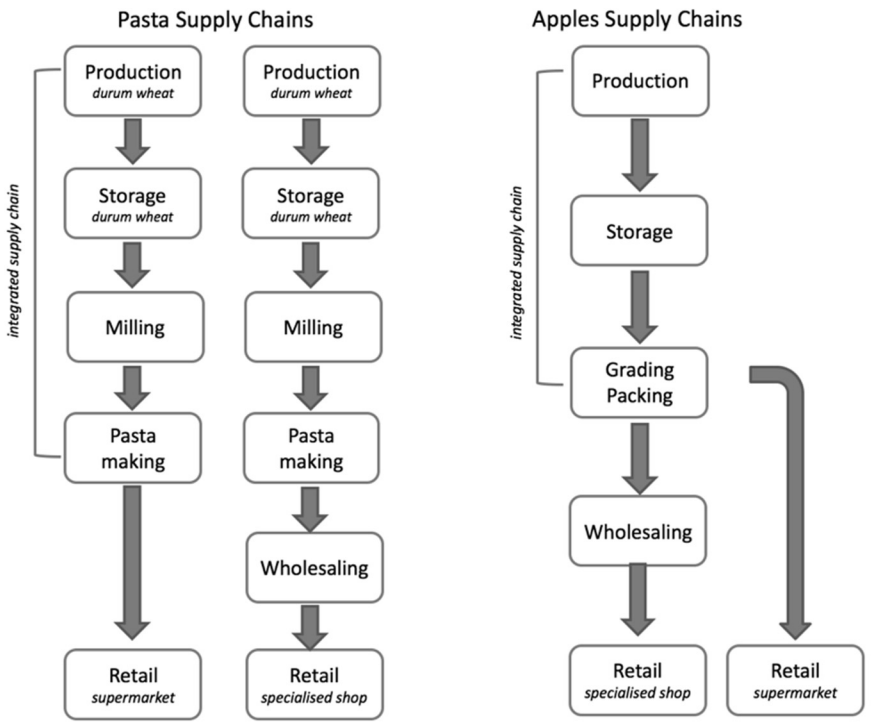
 ISBN 9788891786883

2. Data and methods

We base our analysis on case studies involving relevant actors in the supply chain of pasta and apples. The structure of the supply chains is described according to the supply chain actor involved, from farmers to retailers (see Figure 1.1). For what concerns organic pasta, the supply chain including specialized food shops refers to durum wheat organic pasta with an ordinary organic high quality standard. The second supply chain refers to premium organic pasta from durum wheat produced by a cooperative including farmers, brokers and processors. For what concerns organic apples, the supply chain including supermarkets comprises a consortium of cooperatives, which encompasses almost the entire supply chain, including distribution to large-scale retail trade. In the case of specialized food shop chain, distribution of apples to the retailers is carried out by a distributor specialized in organic products. (see Figure 1).

Fig. 1 – Selected organic pasta supply chains (SC) for organic Pasta and Apples



A specific spreadsheet tool has been developed to recover data about added value from farm gate to the retail, while data for added value at farmer

level has been elaborated from FADN data (all data refer to 2016). The tool follows a "unitary added value" approach, referring to a common functional output unit (i.e. 1 kg of pasta, or 1 kg of apples). For each stage of the supply chains we calculated both the price component and the gross added value (GAV). The first was defined as the difference between the output price and the purchase price, while the second was defined as the difference between output price and the sum of purchase price plus intermediate costs (i.e. gross added value does not include fixed costs and profits). The spreadsheet tool includes an automatic procedure for checking the consistency and plausibility of the elicited data, which allowed an immediate check for the information provided by the interviewee. The interviews were conducted as parof a larger European project that involved the collection and analysis of data of pasta and apple supply chain in several EU countries (Sanders et al., 2016).

3. Results

Table 1 shows the price formation and the gross added value distribution of the selected supply chains for organic pasta and apples.

Tab. 1 – Price components and gross added value (GAV) distribution in the se-lected supply chains (€/kg)

	PASTA (spec. shop)		**PASTA premium (supermarket)**		**APPLES (spec. shop)**		**APPLES (supermarket)**	
	€/kg	**% on retail price**	**€/kg**	**% on retail price**	**€/kg**	**% on retail price**	**€/kg**	**% on retail price**
Farmer price comp.	0,37	15%	0,43	13%	0,61	21%	0,61	24%
of which GAV	*0,13*	*5%*	*0,15*	*5%*	*0,52*	*18%*	*0,52*	*21%*
Broker price comp.	0,03	1%	0,03	1%	-	-	-	-
of which GAV	*0,02*	*1%*	*0,01*	*0%*	-	-	-	-
Miller price comp.	0,23	9%	0,26	8%	-	-	-	-
of which GAV	*0,05*	*2%*	*0,05*	*2%*	-	-	-	-
Processor price comp.	0,77	31%	1,50	47%	-	-	-	-
of which GAV	*0,50*	*20%*	*1,24*	*39%*	-	-	-	-
Wholesaler price comp.	0,58	23%	-	-	1,19	41%	0,84	34%
of which GAV	*0,51*	*20%*	-	-	*0,99*	*34%*	*0,55*	*22%*
Retailer price comp.	0,54	21%	0,98	31%	1,10	38%	1,05	42%
of which GAV	*0,44*	*17%*	*0,82*	*26%*	*1,02*	*35%*	*0,90*	*36%*
Total retail price (excl. VAT)	2,52		3,20		2,90		2,50	

Concerning pasta, in terms of price components and added value the difference between the two-supply chain is mainly concentrated at the processor and retail level. The processor, in the case of pasta sold at supermarket, is also responsible for the distribution of the product to the supermarket, hence capturing the corresponding share of added value of the wholesaler. Nevertheless, the total unitary added value for the processor (1.24 €/kg) is higher than the sum of unitary added value for wholesalers and processors in the specialised shop supply chain (1.01 €/kg) (see Table 1 for more details). The increase in price and added value in the premium pasta supply chain is also remarkable for the retailer, that almost doubles the unitary gross added value if compared to the standard organic pasta sold in the specialised shop. For what concerns the initial supply chain actors, namely farmers, brokers and millers, the gap in price and added value for the premium pasta sold in the supermarket is less evident, but it is relevant to note that farmers and millers obtain price premiums of about 16% and 13% respectively.

The two supply chains for organic fresh apples show a less differentiated situation, also due to a more simple structure with respect to the pasta supply chain. Farm gate price and added value are the same in the two supply chains, as the same product is sold in both (see table 1 for more details). The main difference is at the wholesale-distribution level, mainly due to the different kind of packaging and more complex distribution issues involved in the case of the specialised shop. This situation leads to a retail price that is higher for the specialised shop, particularly due to the highest unitary price component and added value at the wholesale level. The relative share of added value is almost similar for the two supply chains, while the absolute value of the price component in the specialised shop is 0.12 €/kg higher than in the supermarket (see Table 1).

4. Discussion and conclusion

The present study contributes to shed light on the complex and controversial issue of added value formation in organic supply chain. We cannot, however, generalize our results for other supply chains or products. Concerning the distribution of added value among market player in the supply chain, our analysis is consistent with the literature on the subject (Cacchiarelli et al., 2016; Lobley et al., 2009), which shows that farmers' share of the total added value created in supply chain is relatively low if compared to the share of added value of other actors at downstream level. Nevertheless, farmers' share of added value is higher when they are members of large cooperatives

with high efficiency standards and selling, such as the case of Apple supply chain. This result confirms the findings of some previous studies (Naspetti et al., 2011; Pirazzoli et al., 2010), which show that the performance and distribution of added value strongly depends on the structure and characteristics of the specific supply chain. Particularly relevant aspects are: the level of integration and product innovation, and the collaborative planning and decision making among supply chain actors. According to previous studies (Baker and Russel, 2017; Hingley et al., 2008), an improvement in the cooperation and integration along the chain, together with strategies addressed to meet the consumer demand for locally- grown food, represent a real opportunity for small actors to increase their share of added value. In the pasta supply chain including supermarket, supply chain actors were able to form strategic and innovative business partnerships to take advantage of the increasing consumer willingness to pay premium prices for artisanal pasta made from locally – grown durum wheat. Furthermore, in this supply chain, the reduction of the number of stages derives benefits in terms of transaction, logistical and transport costs.

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COOPERATING FOR SUSTAINABILITY: THE ROLE OF FARMERS' NETWORKS IN SPREADING CONSERVATION AGRICULTURE PRACTICES BEYOND NO-TILL IN ITALY

by *Angelo Belliggiano*[*], *Corrado Ievoli*[**], *Danilo Marandola*[***] and *Luca Romagnoli*[***]

1. Introduction

Conservation Agriculture (CA) is an approach to managing agro-ecosystems for improved and sustained productivity, increased profits and food security while preserving and enhancing the resource base and the environment (FAO, 2011).

No-tillage (NT) is one of the main pillars of CA. It is considered a new farming paradigm, ecologically sustainable as profitable for farmers, that leads to the reorganization of labour and investments at farm level.

CA and NT are not the same thing; NT plays a key role in CA systems, but it is also emphasised that NT is just one of the requirements (principles) of CA.

Several authors have explored the role of social mechanisms in the generation of a specific knowledge connected to CA and in its adoption.

Change in tillage and cropping practices requires cooperation between farm and non-farm knowledge (Chougenour & Chamala, 2000), and the spread of CA is often the result of specific social networks (Chougenour, 2003). The role of social networks, in particular, seems significant in the mentioned "transition" to a full membership to CA (Dsouza & Mishra, 2016). Cooperation among farmers and other actors, actually, always plays a key role in promoting the necessary mind-set and to adapt CA principles to specific environments.

Literature emphasizes the importance of (social and environmental) context specificities (Anderson & Dsouza, 2014) and the difficulties to find

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general determinants (education, profitability, etc.) to explain the adoption of CA (Knowler & Bradshaw, 2007).

In this contexts, the aim of this work has been to explore and analyse data from the last Italy's Agricultural Census (2010) concerning the adoption of NT practices among farmers in order to identify the spread and dimension of "real" CA farming systems in Italy and provide knowledge for decision-making processes related to Common agricultural policy tools promoting sustainable use of soil.

2. Methodology and data sources

The assumption underlying the work is that the spread of "real" CA farming systems relies on the creation of social (formal and informal) networks among farmers experienced in NT.

In this sense, the presence of clusters of NT farmers in a certain territory has been considered by the work as a proxy indicator of the adoption of NT as a part of "real" CA systems more than as a mere simplified tillage technique as it is considered by the Agricultural Census.

Census data concerning the adoption of NT practices have been filtered with a heuristic procedure obtaining two statistical collectives of NT farms supposed to be characterised by different degrees of engagement with CA.

Secondly, on the two above-mentioned NT farm collectives, spatial autocorrelation has been determined and analysed. This process led to the identification of clusters of NT farms and brought to the light spill-over effects mainly ascribable to cooperation processes among NT farmers and "other" actors.

The work has been based on the elementary data provided by the Census for the 52.218 agricultural holdings (population "P-NT" from now on) declaring an area greater than 0 ha to q.24.3.

A sequence of filtering operations has been implemented on the data made available by the Census for P-NT in order to exclude from the initial P-NT all the farms adopting NT practice as an occasional choice (in a conventionally managed farming system) instead of a permanent practice within a CA scheme[1].

[1] Special thanks go to Giampaolo Sarno (Agriculture department of Emilia Romagna region) for providing useful suggestions to identify the filtering criteria.

The filtering procedures returned two interesting statistical collectives of NT farms supposed to be characterised by different degrees of engagement with CA principles. These are the P-NT100% and the P-CA farm collectives.

P-NT100% represents the family of agricultural holdings practising NT on the 100% of the A-UAA (but we have no indications on how and why they do so). P-CA represents a (very) restricted collective of holdings that, in consideration of the combination variables described above, we assume to be more probably practicing NT under "real" CA schemes in Italy.

On these two NT farm collectives, spatial autocorrelation has been determined and analysed.

The spatial distribution of NT agricultural holdings (P-NT100% and P-CA) has been a central issue for the purpose of this paper, since it allows to identify possible phenomena of cooperation and networking among NT holdings. These phenomena can be somehow described by how NT holdings tend to cluster within the municipalities.

The existence of significant clusters of similarly-behaving municipalities (i.e. clusters of municipalities with similar number of holdings practising NT techniques) has been obtained by means of spatial statistics tools relying on the concept of *global and local spatial autocorrelation*.

3. Expected results

P-NT100% represents a model of NT holding where cultural and know-how barriers seem to be not so relevant. It actually recalls a farm model typical of mid-Apennine rural areas. The existence of spatial clusters of P-NT100% holdings suggests that the spread of this farm model has been facilitated by the growth of social networks among farmers and also other stakeholders within the landscape of extensive animal husbandry typical of Apennine areas (i.e. the Mid-Apennine White Steer value chain).

P-CA farm model seems also to be very contextualized, but the characteristics of the productive processes of P-CA holdings and their distribution at landscape scale suggest that the adoption of NT practices somehow represents for these farms a strong choice in alternative with conventionally practiced farming operations and with what the majority of farmers do. This (strong) choice seems to be mainly influenced by other economic factors (or limits) (i.e. farm size). The existence of clusters of P-CA holdings suggests the existence of (formal and in-formal) networks devoted to adapt CA practices to the local contexts and to share information and know-how among farmers to generate value.

The identification of clusters of different types NT farm collectives, as presented here, require further in depth qualitative investigation (focus groups, brainstorming, interviews with farmers) in order to demonstrate the existence of the hypothesized networks and to identify the main driving forces of their aggregation processes. This investigation would contribute to fill the evident knowledge gap of the Census in relation with NT and CA.

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THE USE OF EDIBLE COATING AND FILMS IN SWEET CHERRY MARKET: AN OPPORTUNITY FOR ENTERPRISE

by *Angela Mariuccia Andriano*[*], *Roberto Rana*[*] and *Caterina Tricase*[*]

1. Objectives

In the last twenty years, consumers have increased awareness of the importance of healthy nutrition and the environmental impact deriving from food production. Their requests have encouraged producers to research a valid packaging system more sustainability that extends the shelf life of food.

Fresh fruit deteriorated rapidly after harvest and lost their quality in a short period. To satisfy the consumer's demand, edible coating based on biopolymers principally deriving from agricultural by-products (eg polysaccharides, protein or lipids) have been proposed. Edible coating could contribute to improving the environmental and economic sustainability of food sectors since it prevents waste disposal in landfill and promotes their reuse and to carry out the circular economy policy proposed by European Union since 2014. In this way the companies move from linear to circular economy implementing innovative business models that preventing by-products becoming wastes and improving environmental performance of the agro-food sector. According to the components used for producing, edible films and coatings can be classified into following categories: polysaccharides, protein, lipid and composite. They can be used individually or combined. In particular this technology has also been studied for fresh sweet cherry (*Prunus avium* L.), a fruit highly appreciated by consumers, thanks to its organoleptic, nutritional and functional properties (Tricase et al., 2017) and which quickly degrades during transport and storage. Therefore, edible coating and film can extending the shelf life of sweet cherries allows to improve

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 ISBN 9788891786883

their yield and to accelerate market expansion and increase the revenue of farmers.

The present study aims to provide a comprehensive overview of edible coatings and films of fruit and in particular of sweet cherries that show the opportunity for the food industry, environmental protection and customer protection.

2. Methodology

The present study intends to develop an accurate and updated analysis of the literature on this topic through the present in international database of acknowledged scientific relevance such as Scopus and Web of Science.

3. Results and discussions

The study discuss the recent progress of edible coating to maintain the fruit quality for the fresh market.

Fresh fruit deteriorate rapidly after harvest and lose their quality in a short period of time ranging from several days to 1–2 weeks, depending on plant species and cultivar (Valero and Serrano, 2010). In particular, sweet cherry is highly perishable fruit with a short shelf life and high respiration rates. These aspects lead to quality loss of these fruits before reaching consumers. So to prevent losses of harvest and avoid that the fruit quality declines below market standards sweet cherries must be commercialised expedite and sold at a low price (Aday and Caner, 2010). Therefore strategies need to be developed to overcome these hurdles. A possible solution is represented by the edible coating a technology that can contribute to preserve the quality of sweet cherries, to extend their shelf life and to make more attractive for consumers (Mahfoudhi and Hamdi, 2015). Currently edible coating is in experimental phase and researchers are studying the effectiveness of various biopolymers tested during the post-harvest ripening phase of sweet cherry. For instance sodium alginate coating delay its browning, softening, acidity and reduces the respiration rate. Moreover, it is effective in to keep unchanged the total amount of phenolic compounds and the antioxidant activity maintaining unaltered quality of the coated fruits for more time than the conventional packaging. (Díaz-Mula et al., 2012). Also proteins, chitosan, shellac, gum arabic and almond gum, used as edible coatings, show positive effects on the reduction of respiration rate and the ethylene production extending the

shelf life (Aday and Caner, 2010; Dang et al., 2010, Mahfoudhi et. al., 2014, Mahfoudhi and Hamdi, 2015).

In addition, the use of biopolymers obtained from agricultural commodities and/or food-waste products that could create a more circular economy, creating a virtuous cycle. Indeed, this new technology that uses principally biopolymers obtained also from agriculture by-products (e.g. polysaccharides, protein or lipids) contributes to improve environmental and economic sustainability of food sector since it prevents waste disposal in landfill and promote their reuse (Borrello et al., 2016). In this way, the companies move from a linear to circular economy system. In fact, former system is related to negative environmental consequences: reserves depletion, climate change, loss of biodiversity and natural capital, land degradation. These negative aspects contribute to higher resource price volatility, decreasing the economic growth and increasing uncertainty that can be overcome thought the circular economy where waste form valueless products turn into a resource.

According to the European Commission (2014), the circular economy policy could be reached creating a network of enterprises in which by-products are used as inputs in a new production instead of disposal in land filled or directly in soil. In this way, it is possible to implement innovative business models (industrial symbiosis) that facilitate the clustering of activities, prevent that by-products becoming wastes (European Commission, 2014) and improves environmental performances of agro-food sector. Therefore, the development of new business opportunities to tackle environmental challenges (such as waste management) represents an important tool to get firms working together in mutually beneficial ways.

The application of this edible packaging could help in many case to reduce the cost of producing, processing and packaging.

4. Conclusion

The present study has analyzed a new technology that could enhance the use of agricultural by-product and replace synthetic and non-biodegradable packaging. In this way, it is possible to reduce the use of natural resources by promoting the circular economy policy because they are produced using agricultural by-products involving both consumers and supply chain actors. Indeed, edible coatings can satisfy the consumers' demand since are a low environmental impact product. In addition they also increase the income of farmers since the extension of shelf-life of fresh fruit can improve the yield and expand the sweet cherry market. However, the use of this edible-based

coating requires further studies since some problems are still unsolved such as flavour alteration of fruit, scarce protection against external agents (e.g. bacteria, fungi, oxygen, etc.) and the presence of potential allergens.

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SUSTAINABILITY OF PRECISION VITICULTURE: AN ECONOMIC ASSESSMENT OF THE ADOPTION OF UAV TECHNOLOGY IN VINEYARD MANAGEMENT

by *Ruggiero Sardaro*[*], *Vincenzo Fucilli*[**], *Bernardo de Gennaro*[**], *Francesco Bozzo*[**] and *Luigi Roselli*[**]

1. Introduction

Precision viticulture is an innovative approach aimed to support the management of vineyards, raising the efficiency and quality of production and reducing the environmental impact (Whelan and McBratney, 2000; Rouse et al., 1973).

Over the last years, precision viticulture is implementing improved instruments and methodologies for remote monitoring and data acquisition and analysis, such as Unmanned Aerial Vehicles (UAV) (Matese e Di Gennaro, 2015). This approach enables the optimization of Decision Support System (DSS) through the production of prescription maps for variable-rate applications and allowing the implementation of rapid and specific intervention strategies.

The aim of this study is to assess the economic sustainability of the UAV technology on the wine-growing sector of Apulia.

2. Materials and Methods

2.1. Experimental site and remote sensing analysis

The study was implemented on a 4.5-hectare wine farm located in the territory of Cerignola, province of Foggia, Apulia, Italy. The vineyard was based on a 9-year espalier plant of Uva di Troia (Vitis Vinifera L.) vines. The farm was managed by the ordinary wine growing practices of the area,

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based on deficit irrigation, winter fertilization and weekly pest control. Pruning and harvesting were manual, while tillage was mechanized. The experimental design of this study was based on the two adjacent land plots of the same area, which were respectively managed with and without the UAV technology. Three indices were used in this study: the Normalized Difference Vegetation Index (NDVI) (Rouse, 1972), the Soil-Adjusted Vegetation Index (SAVI) (Huete, 1988), and the enhanced NDVI (ENDVI).

2.2. Economic analysis

The economic analysis focused on two main issues: i) the assessment of the potential economic impact of the UAV technology on vineyard management practices; ii) the estimation of the minimum farming area for an efficient adoption of the UAV technology. The economic impact of this innovation was assessed through a budget analysis and the net margin index, this last equal to revenues minus total management costs, defined as specific costs (fertilizers, pesticides, irrigation water) and other non-specific operating costs (upkeep of machinery, energy, contract work, etc.) (De Gennaro et al., 2012; Sardaro et al., 2017).

The budget analysis was based on the following assumptions:

- management costs were assessed considering the current hourly wage of workers for the manual operations and current tariffs charged by agricultural service providers for the mechanical operations;
- revenues included the selling of grapes, but excluded the direct CAP aids;
- revenues were calculated considering the same price of production.

The budget analysis compared the annual net margin between the "ordinary management scenario" (OMS) and the "innovative management scenario" (IMS).

The estimation of the minimum farming area for the adoption of the UAV technology was based on Cash Flow Analysis and the OMS and IMS scenarios were compared through Net Present Value (NPV). To this aim, the following assumptions were defined:

- UAV technology could be used by wine growers of the area through a cooperative management approach, and projections were carried out varying the vineyard size (i.e. the number of farmers involved);
- costs' and revenues' flows were set constant and equal to the average values from the budget analysis of the two scenarios (excluding the UAV costs);

- costs of UAV use by farms were estimated considering instrumental and maintenance costs, as well as operative costs for the phases of acquisition, georeferencing, orthorectification and image processing, calculated as man-hour cost;
- technical lifespan of UAV technology was set equal to 7 years;
- discount rate was initially set equal to 5% (r5), and then to 2% (r2) and 8% (r8) in order to assess the sensitivity of results.

3. Results

The results (Table 1) highlighted that the UAV technology may have a very high potential impact on economic sustainability of wine growing sector. In details, this innovative management system allowed a significant reduction of vineyard management costs (-16%), a slight increase of yields (+8%) and revenues (+8%) and a sensible raising of net margin (+34%). In particular, the implementation of the innovative technology allowed the reduction of costs related to fertilization (-22%), irrigation (-65%), and weed and pest control (-31%). On the contrary, the higher yield caused an increase in the harvesting (+12%) and transportation (+8%) phases.

Supposing an on farm use of such a technology, the costs in the table 2 were collected through a market survey.

Tab. 1 – Economic comparison of the two scenarios.

Management practices	OMS			IMS			Aver. diff. (%)
	2014	2015	Aver.	2014	2015	Aver.	
Soil tillage	*443.42*	*447.67*	*445.54*	*446.42*	*448.47*	*447.45*	*+0.4*
Hoeing	*171.00*	*171.00*	*171.00*	*171.00*	*171.00*	*171.00*	*0.0*
Fertilization	*131.24*	*138.10*	*134.67*	*102.78*	*105.93*	*104.35*	*-22.5*
Irrigation	*583.63*	*617.35*	*600.49*	*210.48*	*213.71*	*212.10*	*-64.7*
Weed and pest control	*599.95*	*621.93*	*610.94*	*414.65*	*433.65*	*424.15*	*-30.6*
Green pruning	*171.00*	*171.00*	*171.00*	*171.00*	*171.00*	*171.00*	*0.0*
Pruning	*342.00*	*342.00*	*342.00*	*342.00*	*342.00*	*342.00*	*0.0*
Harvesting and transport	*788.56*	*791.75*	*790.16*	*874.60*	*876.26*	*875.43*	*+10.79*
Total management costs (€/ha)	**3,230.79**	**3,300.80**	**3,265.80**	**2,732.93**	**2,762.02**	**2,747.48**	**-15.9**
Grapes production (ton/ha)	15.70	16.60	16.15	16.80	18.10	17.45	+8.0
Price (€/ton)	383.60	388.70	386.15	383.60	388.70	386.15	0.0
Revenues (€/ha)	**6,022.52**	**6,452.42**	**6,237.47**	**6,444.48**	**7,035.47**	**6,739.98**	**+8.1**
Net Margin (€/ha)	**2,791.73**	**3,151.62**	**2,971.68**	**3,711.55**	**4,273.45**	**3,992.50**	**+34.40**

Tab. 2 – Costs of the UAV technology.

Items	Amount
Instrumental costs (UAV + Camera + Personal computer + software + patent) + administrative costs	€ 14,500.00
Maintenance costs (UAV + insurance + hardware + processing software)	€ 750.00
Operating costs (power, rent, taxes)	€ 1,000.00
Specialized operator costs (acquisition, georeferencing, orthorectification and image processing)*	€ 16,800.00
Restoration costs	€ 2,115.00
Total costs	**€ 37,465.00**

* Equal to six months' (April - September) wage for one specialized operator.

Given the small average area of the wine farms in the considered territory (2.4 hectares – Istat, 2010), and assuming a cooperative management of this technology among farmers, the trend of NPV for adoption of UAV technology is heavily affected by vineyard size (figure 1).

The estimated minimum farming area was equal to 36.7 hectares (figure 2), i.e. the minimum threshold for which the UAV costs per hectare equalled the gain in net margin per hectare, switching from the OMS to the IMS.

Fig. 1 – Net Present Value of the UAV technology

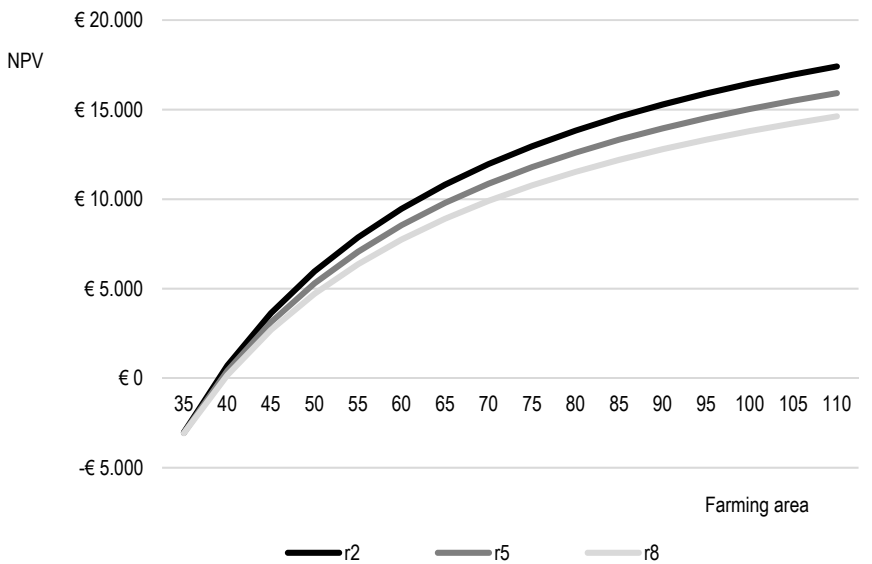
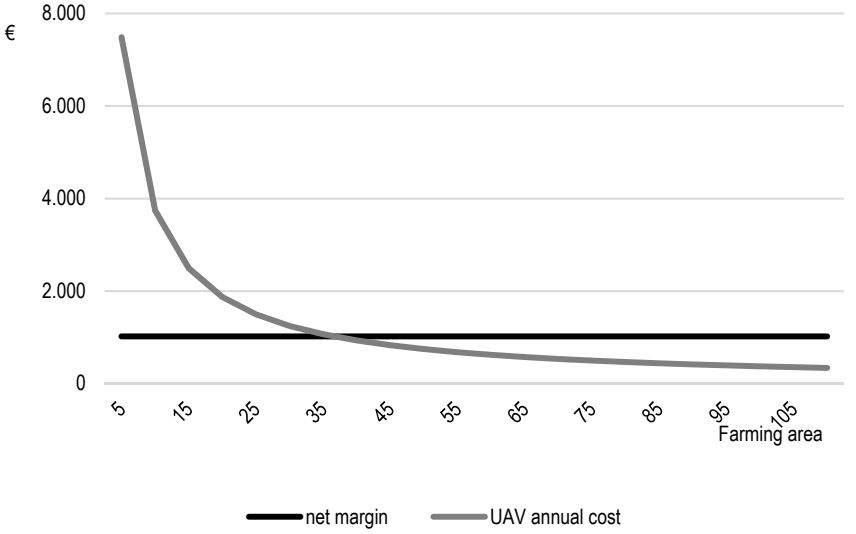


Fig. 2 – Minimum farming area for the UAV technology.



4. Conclusions

The results of this study pointed out that the use of UAV technology in the wine growing of the northern Apulia was profitable only for large vineyards, i.e. higher than 40 hectares. In this regional area, due to the high fragmentation of farms, the reliable adoption of this innovation maybe fostered only if cooperative solution is promoted. This strategy could represent a source of added value and a strategic development tool for territories, fostering social cohesion, economic development, environmental protection and territorial identity. Cooperation in wine growing could favour the definition of new horizons of development and the building of new organizational models in the sector, according to a sustainable approach referred to the totality of farmers.

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COMPARING ORGANIC AND CONVENTIONAL OLIVE GROWING. A SOCIO-ECONOMIC EVALUATION IN A LIFE CYCLE PERSPECTIVE

by *Anna Irene De Luca*[*], *Teodora Stillitano*[*], *Nathalie Iofrida*[**], *Giacomo Falcone*[*], *Giovanni Gulisano*[*] and *Alfio Strano*[*]

1. Introduction

In Mediterranean regions, olive growing and maintenance of rural economies are strictly connected (Bernardi et al., 2016, 2018; Stillitano et al., 2017, 2018). Small and medium-scale farms have to face market challenges by balancing profitability, quality, and new consumer's needs oriented toward more sustainable requirements in terms of healthy and socially responsible production. In this study, organic and conventional olive production systems have been analysed and compared in order to assess their social and economic impacts considering the agricultural phases of the product life cycle.

Life Cycle Thinking (LCT) tools are widely accepted for their ability to prevent burden shifts by assessing the impacts of the life cycle of a product, from planning to disposal or recycle (De Luca et al., 2015a, 2015b, 2018a, 2018b).

2. Materials and methods

For the purpose of this study, socio-economic impacts are evaluated by applying the Life Cycle Costing (LCC) and the Social Life Cycle Assessment (SLCA) methodologies. The study area is the "Lamezia Terme Plain", in Calabria region (South Italy), a renowned area for the Protected Designations of Origin (PDO) "Lamezia". Territorial surveys and interviews with privileged stakeholders (olive growers, wholesalers and trade associations) highlighted two main management systems, i.e., conventional and organic ones,

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 ISBN 9788891786883

mainly widespread in plain areas, that were chosen as production scenarios to be analysed: "conventional-plain" (CP) and "organic-plain" (OP). A lifetime of 60 years was taken into account, 1 ha of olive orchard was the functional unit (FU), and the system boundary is "from cradle to farm gate".

The olive life cycle was divided into six main stages: (1) planting, (2) unproductive, (3) increasing production, (4) constant production, (5) decreasing production, (6) end of life. Costs and revenues of each scenario were inventoried (initial investment costs, operating costs of each production stage and disposal costs). Total revenues were evaluated multiplying the olive yield by its market price referred to the 2011/2012 harvesting season, including EU direct subsidies. Then, all costs and revenues were discounted by using a discount rate equal to 1.8% (Stillitano et al., 2016). Net Present Value (NPV) and Internal Rate of Return (IRR) were chosen as indicators of investment feasibility (De Luca et al., 2014). Finally, a sensitivity analysis was performed by assessing the NPV and IRR as a function of the olives selling price and by excluding public subsidies, in order to reflect the market price dynamics in a free market (Stillitano et al., 2016).

Concerning the SLCA, a Psychosocial Risk Factors (PRF) pathway (Gasnier, 2012; Silveri et al., 2014; Iofrida et al., 2018) was applied, to predict damages on health on the workers directly involved in the life cycle of a product. The PRF impact pathway consisted in four steps. The inventory consisted in accounting the hours of work per each agricultural task and per each life cycle phase (quantitative data), surveying also the typology of task (qualitative data). Each task was characterized in terms of typology of working condition, such as pesticide exposure, noise, vibrations, temperature, work under pressure, etc. A literature review among published scientific studies was conducted to gather associations between these working conditions with psychosocial health risks, in terms of odds ratios (OR), a statistical measure of the intensity of association between two variables. A PRF Matrix has been constructed putting in relation every working condition with one or more psychosocial risk.

3. Results

The results of the economic analysis showed that, in terms of cost per life cycle stage, the OP scenario achieves the better performance compared to CP scenario. Focusing on constant production stage, harvesting and pruning operations had the highest share of operating costs with values ranging from 27% to 29% for conventional system and 25% to 27% for organic one,

respectively. These results were mainly due to the high human labour cost despite the medium-high level of farm mechanization. Findings of the investment feasibility analysis by including public subsidies revealed that the OP scenario was the most economically feasible alternative, by recording a NPV of 47,456.58 € ha^{-1} and an IRR of 4.9%. The profitability of the organic systems was positively affected by the higher market price, lower production costs, as well as the access to more subsidy to organic farms. A sensitivity analysis was performed by assuming diverse olives sale prices, which range from 0.50 to 0.80 € kg^{-1} for the conventional scenario and 0.60 to 0.90 € kg^{-1} for organic one, and by excluding European subsides. The simulations demonstrated that, at the current market prices, investments in olive production systems were not economically sustainable. To generate positive NPV and IRR values, olives price must raise up to 0.60 € kg^{-1} for CP scenario and 0.65 € kg^{-1} for OP.

Concerning the social impacts, the conventional scenario showed to be worse than the organic one, both in terms of hours of particular working conditions and of typology of psychosocial risks. In fact, the CP scenario shows the highest risk for the impact category "back pain" with 81.938 hours of risk, followed by 33.067 hours of risk for osteoarthritis and 31.763 hours of "neck and shoulder pain". The OP scenario is the best also in qualitative terms. In fact, the CP scenario exposes workers to the risks of potentially mortal diseases, such as cutaneous melanoma (421 hours), Parkinson disease (907 hours) and Non-Hodgking's lymphoma (1.004 hours) (Fritschi et al., 2005; Elbaz et al., 2009; Fortes et al., 2016). These results are mainly due to the use of pesticides (copper-based pesticides, organophosphate insecticides, and glyphosate).

Concluding, the organic scenario demonstrated to be more economically performant than the conventional one, due to the higher market prices and the lower production costs, as well as the access to the European subsidies for organic farming. However, at the current market conditions and by excluding public subsidies, investments in both scenarios were not economically sustainable. The organic production showed the best results also in terms of psychosocial working health conditions, especially because of the reduced use of chemicals and pesticides, but further research should be necessary to investigate social impacts on other stakeholders groups, such as supply chain actors and consumers.

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EXPLORING ITALIAN OLIVE OIL CONSUMERS' PURCHASING BEHAVIOUR: INTERACTIONS BETWEEN GEOGRAPHICAL INDICATION AND ORGANIC LABELS

by *Luigi Roselli*[*], *Giacomo Giannoccaro*[**], *Domenico Carlucci*[**] and *Bernardo De Gennaro*[**]

1. Introduction

Since the first years of 90s, the European Union established two main quality schemes: geographical indications (GIs) and organic production (OP). Although, these two product categories still represent a small share of food market, quality certification schemes seems to sustain the food consumption pattern during the current economic crisis (ISMEA, 2014; ISMEA-Qualivita, 2017). There is a vast literature focusing on EU quality schemes applied to many food categories, including extra-virgin olive oil (EVOO) (e.g.: Scarpa & Del Giudice 2004; Aprile et al., 2012; Cicia et al., 2013; Di Vita et al., 2013; Carlucci et al., 2014; Panico et al. 2014; Del Giudice et al., 2015; Chinnici et al., 2016; Roselli et al., 2016; Boncinelli et al., 2017; Cavallo & Piqueras-Fiszman, 2017). However, in most of these studies GIs and OP have been separately analysed, under the assumption of independence. This paper aims to prove if there are some synergies between GIs and OP labels on olive oil products. Differently from previous studies, in this research the two certifications (GIs and OP) for olive oil products are simultaneously analysed while the independence from each other is checked. To reach this objective, the Italian olive oil consumers' purchasing behaviour has been investigated through a survey involving a national representative sample of primary olive oil purchaser for household members.

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 ISBN 9788891786883

2. Data and methodology

2.1. Data collection and data set

The survey was conducted during the period of January-February 2017 through a web-questionnaire administered by an agency specialised in market surveys. The target population was represented by household responsible for purchasing food and olive oil. The recruited sample was representative of the Italian population by age, gender, and geographical area. The collected information concerned socio-demographic characteristics, olive oil buying habits, purchasing motivations, attitudes and beliefs about food consumption and environmental issues.

We collected a data set containing 1,061 completed questionnaires. The sample was quite balanced with minor deviation respect to the Italian population. With reference to the gender, the sample was well adjusted around the fifty. The average age of respondents was 44-year-old, lower than the adult Italian population (51 years), in line with other on-line surveying to Italian food consumers. The average family size was of 3.2 members, a bit larger than the Italian statistics (2.4). The household with younger (< 18-year-old) members were 43% with an average of 1.5 young people. The educational level showed an unfair pattern with the primary level being underrated.

2.2. Empirical model

The main factors explaining the purchase of olive oil with GIs or/and OP were investigated through a bivariate probit model. The bivariate probit model is a joint estimation for two binary outcomes. That is, two binary choice models where the final observed outcome (to be buyer of olive oil with GIs or/and with OP) reflects a choice of two decisions instead of a single decision. These decisions may be correlated, with correlation ρ. This is a natural extension of probit model, which allows for handling more than one equation, with correlate disturbances. The Lagrange multiplier statistic is implemented for testing the absence of correlation in this model. Under the null hypothesis that ρ equals zero, the model consists of independent probit equations, which can be estimated separately.

The variables used in the model are shown and defined in Table 1. The two decision variables of the model are dichotomous variables. The first one, called GEOGRAPHIC, takes value one if the respondent states that she/he buys EVOO with Geographical Indications and zero otherwise. Similarly,

the second decision variable, called ORGANIC, takes value one if the respondent states that she/he buys organic EVOO and zero otherwise.

Tab. 1 – Variables coding in the bivariate model

Variable name	Type	Variable coding	Sample value (Std. dev.)
Dependent variables			
GEOGRAPHIC	dummy	1= respondent buys EVOO GIs; 0= otherwise.	0.89 (0.31)
ORGANIC	dummy	1 = respondent buys EVOO OP; 0= otherwise.	0.68 (0.46)
Independent variables			
area	categorical	1= North-West of Italy; 2= North-East of Italy; 3= Centre of Italy; 4= South of Italy.	26% 19% 23% 32%
retail channel	categorical	1= large retailer; 2= gourmet food store; 3= farm&mill gate; 4= on line & others.	69% 5% 23% 3%
frequency	ordinal	EVOO purchase frequency: 5= more times a month; 4= once a month; 3= once over three months; 2= once over six months; 1=once a year.	 35% 33% 17% 8% 7%
age	continuous	Age of respondent	44 (14)
education	categorical	1= primary; 2= secondary; 3= tertiary.	11% 51% 38%
low income	dummy	Household monthly income: 1= if < 1,000 €; 0= otherwise.	0.11 (0.31)
household size	continuous	Number of household members	3.19 (1.17)
young	dummy	1= presence of young members; 0= otherwise.	0.40 (0.49)
donation	dummy	1= donation to environmental associations; 0= otherwise.	0.40 (0.49)
bitter taste	ordinal*	Importance of bitter taste in EVOO oil purchase.	4.12 (1.76)
green behaviour	ordinal*	Importance of environmental issues in food purchase.	5.87 (1.18)
health motivation	ordinal*	Importance of consuming EVOO for health enhancement.	5.97 (1.18)

**Likert scale from 1 to 7 where 7 means higher level of importance.*

3. Results

The bivariate probit model was estimated in the STATA 14 computer program. Table 2 reports the estimated parameters.

The first result of econometric regression refers to the independence between GIs and OP. The ancillary parameter rho, which measures the correlation of the residuals from the two models, turns out significant. It means that errors for both equations are highly correlated. Consequently, the simultaneous estimation of both equations in the model is the appropriate approach to obtain consistent parameter estimates. Moreover, according to this finding the independence of both certifications in the purchase behaviour of EVOO is rejected.

Tab. 2 – Estimate parameters of the bivariate probit model

Variable	Coef.	SE	p-value	Coef.	SE	p-value
	Eq. (1): GEOGRAPHIC			Eq. (2): ORGANIC		
area (South):						
North-West	0.396	0.171	0.020	0.213	0.125	0.086
North-East						
Centre						
retail channel (large retailer):						
gourmet store				0.793	0.283	0.005
farm&mill gate	-0.461	0.165	0.005	0.467	0.141	0.001
on line & others						
frequency	0.125	0.058	0.031	0.291	0.049	0.000
age				-0.009	0.003	0.009
education (secondary)						
primary						
tertiary	0.279	0.131	0.034			
low income	-0.406	0.170	0.017	-0.259	0.148	0.080
household size				-0.095	0.045	0.035
young						
donation	0.292	0.132	0.028	0.385	0.096	0.000
bitter taste	0.072	0.034	0.038	0.085	0.026	0.001
green behaviour	0.114	0.057	0.047			
health motivation				0.109	0.047	0.022
Constant				-0.682	0.324	0.045
Number of obs. = 927						
Log likelihood = -788.55						
Wald chi^2 test (32) = 191.94 Prob > chi^2 = 0.000						
Wald chi^2 of rho = 0; chi^2 (1) 26.54 Prob > chi^2 = 0.000						

The purchase of EVOO with GIs is not neutral across Italian areas. EVOOs with OP are mostly purchased at gourmet food stores and to a lesser extent at farm or mill gates.

As a whole, as the frequency of EVOO purchasing increases, the likelihood of being a buyer of EVOOs with two quality labels also increases. With reference to socio-demographic features, major likelihood of purchasing has been found for those who attained tertiary education level and are living with young people. Moreover, those who have donated to environmental associations and have pro-environmental food purchasing behaviour show higher likelihood of being a purchaser of EVOO with both certifications. By contrast, those with low income and living in family with large number of household members show lower probability. Also the respondent' age shows negative sign.

4. Conclusions

The results of the study confirm that there are significant synergistic effects between European quality labels in the olive oil market. This outcome has some practical implications for firms' competitive strategies. In fact, olive oil industry can use these insights to better tailor marketing strategies in order to meet the needs of consumers interested in both quality labels. For instance, according to our results it seems that the two labels satisfy the preferences of an emerging consumer segment of EVO oils, namely those of the demanding consumer. These are consumers who are positively attracted by experience attributes, such as taste and, at the same time, are sensitive to health and environmental concerns. Another important implication of our results concerns the methodological approach. Given the existence of dependence between the two food quality cues, should be taken into account when analysing olive oil consumers' purchasing behaviour. Finally, the main limits of this study are those typical of studies based on consumers' stated purchasing behaviour.

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ASSESSING THE EFFICIENCY OF THE ITALIAN AQUACULTURE COOPERATIVES

by *Maria Bonaventura Forleo*[*], *Luca Romagnoli*[**], *Nadia Palmieri*[**] and *Angela Di Nocera*[**]

1. Introduction

The seafood sector contributes to global food supply and provides an important source of animal proteins (Kobayashi et al., 2015). In 2014, 50% of the world fish harvests came from aquaculture (FAO, 2016). World production of aquaculture is dominated by Asian countries, while the EU28 contribution has decreased significantly in both volume and value terms (EUMOFA, 2016). In Italy, the fish harvested from aquaculture amounted to 140 thousand tons in 2014 (MiPAAF, 2014). Over the past decades, the consumption of fish has risen and future demand is expected to increase, as such providing a unique opportunity to expand the aquaculture production, while counting for production methods and environmental impacts (Castellini et al., 2012).

Some researches gave insights about the economics of aquaculture in the EU, by analysing data of productions and sales, structures, employment, and economic performance (Guillen et al. 2015; STECF 2016). Similar studies about the Italian sector focused on aggregated economic and financial results of (MiPAAF, 2014; Santulli & Modica, 2009); other Authors (Di Trapani et al., 2014) proposed a study of the economic profitability of two firms with different aquaculture production systems, offshore and inshore, by means of a cost-benefit analysis.

In order to move forward the aquaculture sector, it is important to deepen the knowledge about firms' characteristics and their performances.

Despite the growing importance of aquaculture products and policies in Europe, little attention has been given to study the economic performance at

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firms' level (Asche & Sikveland, 2015) and to investigate their efficiency and profitability by focusing on single units and on different types of organizations (Iotti & Bonazzi, 2015).

Iliyasu A. et al. (2014) highlighted that most of the efficiency studies related to the aquaculture firms focused on the analysis of technical efficiency and devoted a limited attention towards cooperatives.

Finally, studies dealing with the efficiency and productivity of the Italian aquaculture firms are rather limited, apart from that of Furesi et al. (2016) -dealing with Italian fishing firms-, and some studies on aquaculture cooperatives (Ismea, 2009; Panunzi, 2014) -that analysed the profitability and economic sustainability of firms by applying a balance sheet analysis-.

This study aims at contributing to the above literature by focusing on the Italian cooperatives operating in the aquaculture sector in order to investigate their budget performance and economic efficiency.

2. Materials and methods

Data of aquaculture cooperatives (192 units) for the years 2015-2016 were collected from the Register of the Companies of the Italian Chambers of Commerce. Descriptive statistics for the whole population of Italian cooperatives were reported. Successively, an efficiency analysis was applied to a sample of cooperatives (87 units) by applying a conventional output oriented Data Envelopment Analysis (DEA). Charnes et al. (1978), based on Farrell's model (1957), firstly proposed DEA technique. DEA identifies a firm as efficient when no other firm is capable of producing a higher output from the same input (output-oriented) or, alternatively, of producing the same output from less input (input-oriented) (Sellers & Alampi Sottini, 2016; Emrouznejad, et. al, 2008). The efficiency analysis was based on four cost's indicators used as input variables –raw materials costs, staff costs, cost for capital endowment, and other services and operating costs-, and on the production value as the output variable. The analysis was first applied to the entire sample; then, a significance test was applied to investigate differences in efficiency scores based on the location and size of cooperatives.

3. Results

Results show a great variability of firms' performances in terms of budget and efficiency indicators.

As far as the budget analysis, the descriptive statistics support the well-known characteristic of cooperatives that, unlike capitalist companies, are not aimed at maximizing returns on capital investments. The main findings can be summarized as follows: the difference between the value and the costs of production is negative in the first quartile of firms and reaches only a slightly positive value in the 50% of units; the turnover index reaches an average value of parity; the percentage of short-term assets versus total assets has an average value of 0.65; finally, the current test ratio shows a value of 1.6, but the median is 1.2 and ¼ of units has a value below 1, as such risking a short-term solvency problem.

As far as the efficiency analysis, the average score shows that efficiency improvements are possible by increasing the output value, both under constant and variable return to scale (CRS and VRS) hypotheses. Considering the distribution of the VRS efficiency scores, the first quartile of cooperatives shows a global efficiency score (equal to 1). Half of the sample reaches a threshold of (in-)efficiency of 1.06 and 1.22, respectively under variable and constant return to scale. Around 40% of units is efficient under VRS and about 21% under the CRS hypothesis.

Looking at the VRS average scores by subgroups based on the location of cooperatives, it appears that firms located in the Southern part or in the Islands are more efficient than those located in the Northern-Central Italian regions, even though the scores are not so much different (respectively, 1.2 and 1.9); when referring only to inefficient units, the average inefficient score is almost the same (1.33 *versus* 1.34). Anyway, the median threshold reports that the first half of the sample is more efficient (or lower inefficient) in the Northern located units (1.03 *versus* 1.08) than in the others. Inefficient units in the sample are quite equally distributed between Northern (48%) and Southern (52%) units. In relation to the respective sub-samples, the 64% of the Northern cooperatives and the 56% of the Southern units are inefficient under a VRS hypothesis.

Considering the size of the firms, all scores have a higher value in the smallest group than in the biggest one, showing on average a worst performance of the smallest aquaculture cooperatives. Indeed, the average score of the smallest units is higher (1.25) than the score of the biggest firms (1.04); in terms of inefficient units, the scores are respectively 1.38 and 1.11. Furthermore, the maximum inefficiency score of the smallest firms is much greater than that of the biggest units. Both the standard deviation and the gap between VRS scores are higher for the smallest cooperatives. Based on the variable return to scale hypothesis, inefficient units were mainly (85%) of a

small size; on the other side, the two third of the smallest units appeared inefficient compared with the 40% of the biggest ones.

Testing the differences of scores by location and size, size is more important than location in relation to the efficiency performance of cooperatives.

Study findings cannot be further analysed by pointing out efficiency drivers and obstacles, so as the non-homogeneity of aquaculture systems and products, due to the lack of firms' data at national scale. Anyway, efficiency scores about aquaculture cooperatives may be compared with the values derived in Idda et al. (2009) and focused on the small-scale fisheries, that measured the potential output increase in 24% (under CRS) and 16% (under VRS). Finally, our results appear in line with those summarized in the review of Iliasu et al. (2014) that estimated a potential efficiency increase around the 30% by averaging the coefficients reported from several studies and related to different countries, aquaculture systems and technologies.

Results suggest that there is a room for improving the efficiency performance of the Italian aquaculture cooperatives. On the other side, study findings reveal their limitations and suggest the need for more detailed and harmonized data -both quantitative data and information about rearing techniques, fish species, and aquaculture systems- that are not available at national scale, in order to get a deeper picture of the efficiency of aquaculture firms and to support public policy intervention.

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STOCK PRICES TRANSMISSION TO AGRICULTURAL MARKETS IN ITALY

by *Samuele Trestini*[*] and *Carlotta Penone*[**]

1. Introduction

World food prices, since the beginning of the 20th century, increased both in value and in volatility, leading to a period of instability for global and national food prices. Although, nowadays prices are lower than in 2011 peaks, extreme price movements had a lasting effect on public perception (Baffes and Haniotis, 2016).

For Italian and European farmers, price risk management (PRM) instruments are becoming increasingly important due to the growing risk of agricultural activity and the high degree of volatility that agricultural markets have shown in the recent past (Tangermann, 2014). Domestic stabilization policies, protecting European farmers from the volatility of international prices and reducing income risk (Trestini et. al, 2017), decoupled domestic prices from stock markets, making price risk management instruments useless (Larson et al, 1998). The gradual abandoning of price support policies transferred the volatility of international prices to EU farmers (Enjolras et al., 2014).

Future contracts are the most common price risk management instruments among foreign farmers; they are based on international stock markets, like in the US (Chicago Board of Trade or CBOT) or in some EU countries (EURONEXT). Even if Italian farmers cannot benefit directly from a domestic futures and options market, the stronger is the link between the Italian spot prices and international stock markets the better would a financial instrument hedge price risk for farmers.

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 ISBN 9788891786883

Within the context of agricultural commodity, research on price transmission focus on the relationship between domestic and international prices for a wide number of commodities (Conforti, 2004; Mundlak and Larson, 1992; Baffes, 2003), or on the transmission of a single commodity between different counties (Machado e Marigrado, 2001; Li and Zhang, 2011; Esposti and Listorti, 2013; Penone and Trestini, 2018), or, lastly, on the relationship between two countries among different commodities (Rhichardson, 1978).

The aim of this article is to broaden the knowledge on the relation between soybeans Italian markets and CBOT futures market. To this context, it has been investigated how CBOT soybean futures prices influence national soybean spot prices of AGER (*Associazione Granaria Emiliana Romagnola*) market in Bologna. This paper analyse soybeans weekly prices from January 2006 to December 2016. Moreover, the international prices analysed were converted in Euro using the corresponding Euro/USD weekly currency rate.

2. Materials and methods

According with the law of one price (Mundlak and Larson, 1992), within efficient markets, the price of a domestic commodity could be expressed as a product of world prices for the nominal exchange rate, once transaction and transportations costs are accounted for. Nevertheless, examining historical dataset with linear regression could lead to bias results when the hypothesis of stationarity is not respected (Baffes and Gardner, 2003). Time series stationary has been tested, with and without trend, with an Augmented Dickey-Fuller (ADF) test. This allows us to accept the hypothesis of stationarity for the time series without trend

The series without trend, proven stationary, has been studied according to the following model:

$$Pd_t = \alpha + \beta_1 Pw_t + \beta_2 E_t + \varepsilon$$

Where:

- Pd_t = Bologna price for soybeans €/ton, without trend, to a given time t;
- Pw_t = CBOT nearby futures price for soybeans €/ton, without trend, to a given time t;
- E_t = exchange rate euro/USD, without trend, to a given time t.

The model was also estimated with the addition of monthly dummy variables, inserted by a forward approach, to be able to assess the effect of each month on the definition of the domestic price.

3. Results

The independent variables of the model are able to explain most part of domestic price; the Adj-R^2 values, for the model without and with monthly dummy variables are respectively 0.854 and 0.865. It is also interesting to note that the estimated β_1 coefficients (0.99 with dummies, 1.01 without dummies) are close to the unit and highly significant in both regressions. β_2 value (125.53 with dummies, 117.56 without dummies), is the main variable able to modify the magnitude of domestic price compared to CBOT. Based on an average values of E_t and Pw_t in 2016, the price premium for the domestic market is 138.91 €/ton without dummy and it is 130.09 €/ton with dummy.

Regarding the second model, it is possible to appreciate some seasonal variation in the price transmission. In fact, June has a negative coefficient (-7.74), that indicates that the Bologna premium is lower than the CBOT futures price. Instead, from August to November, the monthly variables are characterised by significant positive coefficients (August 12.45, September 11.07, October 9.23, November 6.22). We can interpret these estimates by considering that June represent the month in which national stock of imported product is higher: this abundance brings down domestic prices compared to CBOT. Instead, from August, Italian stock starts to be low supporting Bologna price compared to futures price. With the progress of the months, this values decrease due to the new soybeans crop closing up on harvest time.

Overall, the two model well describe Bologna variable with respect to CBOT and the currency values.

By applying this model, it will be possible to evaluate the feasibility of price risk management instruments for Italian farmers in the arable crop sector, forecasting domestic prices on CBOT futures markets. Futures contract could be an opportunity for hedge price risk and improve in the organization of the supply chain. These results allow the possible development of a hedging strategy for farmers, but there are still some unknown factors that need to be analysed. Further studies would be aiming to improve the understanding of farm hedging strategies.

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HAVE THE EATING HABITS OF EU CONSUMERS UNDERGONE STRUCTURAL CHANGES? A NEW MODEL FOR TRACKING LONG-TERM TURNING POINTS (1961-2013)

by *M. Antonietta Lepellere*[*], *T.F. Margherita Chang*[**], *Luca Iseppi*[**] and *Maurizio Droli*[**]

1. Introduction and objectives

The ratio between the energy derived from the foods that characterize the *Mediterranean Diet* (MD) (Alberti-Fidanza, 2004) and those that don't characterizing it (Mediterranean Adequacy Index or MAI), has been assumed as one of the most important public health predictor for Coronary Heart Disease (CHD) (Alberti-Fidanza et al., 1999). Its long-term trend can be used to establish public health targets. Nevertheless, a recent article (Chang et al., 2017), using FAO data, evidenced that eating habits of most European countries have reduced the adherence to MD (1961-2011). The aim is to develop a model/method (a solver) able to detect the presence/absence of a turning point in the MAI trends of 22 countries in that period. The basic hypothesis is that, in the long term, the evolution of the MAI can be divided into two lines whose point of intersection can be a turning point. The ultimate goal is to establish the classes of food styles that have characterized these changes.

2. Method

Different methods are available (Piccini et al., 2017, 2016). Given a series of FAO (CIHEAM/FAO. 2015) data, the adopted method consists in operating at the same time two linear regressions left and right. For the left regressions, the first two points of the series are taken into consideration, the first three and so on until all are considered, one of them is similar to the right, taking the last

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 ISBN 9788891786883

two, the last three and so on. Let a and b be the angular coefficient and the intercept of these lines respectively and E the quadratic errors, i.e.

$$a = \frac{\sum_{i=1}^{n} y_i \sum_{i=1}^{n} x_i^2 - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} x_i y_i}{n \sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2}$$

$$b = \frac{n \sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{n \sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2}$$

$$E = \sum_{i=1}^{n} (a x_i + b - y_i)^2$$

For the right regressions the index n varies from 2 to the total number of data indicated with T. To obtain the right regression lines the index i varies instead from T-1 to T for the first line, from T-2 to T for the second and so on. The turning point will be identified by that index such that the sum of the errors of the respective left and right regression lines is the minimum. The test of coincidence between the experimental point of intersection of the two regression lines and the theoretical one is performed.

3. Results

In all cases studied, the two-segment regression have a smaller error compared to that obtained with a single regression line. There are only three countries, Denmark, the Netherlands and Portugal, for which the quadratic regression is better. The test of coincidence is not validated for Sweden, Ireland, United Kingdom, USA, and Denmark. Eleven out of fifteen countries (included the EU and Japan) have undergone a valid turning point in the 70s of the last century, three in the 80s and one in the 90s. The most timely were Spain, Japan, Finland, France and Malta, and 10 years later Italy, followed by Austria, Hungary and Cyprus.

Let the level of MAI be defined as: High if MAI≥1.8, Medium if 1.5≤MAI<1.8, Low if 1≤MAI<1.5 and Very low if MAI<1. Currently 11 countries (EU included) remain after the turning year in the Low category of MAI, and 2 in the Very Low category (Finland and Denmark). According to epidemiological studies, these countries are at high risk for health e.g. cardiovascular diseases. Although the health policies of some of these countries have led to a slight increase in the MAI, their efforts are not enough to improve life expectancy and permanent disability. Only 4 countries reported an Highness

of MAI (Japan, Greece, Romania, and Italy), and 3 a Medium level (Spain, Bulgaria, and Portugal), notwithstanding the decreasing of their MAI.

The four countries which did not pass the coincidence test of the turning point, Sweden, Ireland, the United Kingdom and the USA, have seen increasing the MAI. Also Denmark did not passed the tests, but the level of MAI remained Very low. The most significant declines after the turning year are observed for Japan followed by Spain, Romania, Greece and Bulgaria. All these countries maintained their MAI in the long-run at the top, except Spain and Bulgaria, whose MAI dropped from High level to Medium one. The MAI of the other countries has a very slow growth (angular coefficient near 0 but positive), and Hungary is the country with the highest grow in the second period, although the long-term MAI remained the same. Italy, on the contrary, after the turning point, has a declining MAI but that remains very high: about 1.91 (2013). Countries that also improve the level of the MAI from Very low to Low are 4: Sweden, Ireland, the UK and the USA, while France, Hungary, the Netherlands, Austria, Germany, and the EU average, maintained the previous Low level.

In EU-27 countries four food styles have emerged: Mediterranean, Balkan, Mittel-European, and Eastern European (Chang et al. 2017). The application of the method for detecting turning points succeeded for Mediterranean, Balkan countries and Japan; after a drop their MAI stabilizes at High/Medium levels ($\geq$1.5). Also for the majority of the Mittel-European countries the model succeeded, and the MAI double trend is weakly shaped as bowl around Low levels of stabilization ($1 \leq MAI < 1.5$). Therefore, the eating habits of surveyed countries generally converge towards a higher protein, animal-like food style than in the past, typical of societies with mechanical mentality and industrial lifestyle. Trends towards reduction of animal protein's content begin to develop (veganism), and as a consequence of animal welfare, but the mass of the population is far from taking this course. Much of the effect of animal-intensive diet can be traced back to the ongoing globalization process of food and life styles, not yet affected by the increasing sensitivity to a healthier lifestyle. The economic crisis didn't help to evolve towards more advanced food systems, based on consumer sovereignty that takes into account the agro-food cultural heritage, and a return to traditional agro-food chain management. On the contrary, the depletion of the less well-offed bands of the population led back to the junk food path. Healthy food policies taking into account structural changes occurred aim at modifying food industry and eating habits are expected (Chang et al, 2014, 2015).

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THE IMPACT OF THE CAP ON ORGANIZATIONAL ARRANGEMENTS IN ITALY

by *Gabriele Chiodini*[*], *Stefano Ciliberti*[**]
and *Angelo Frascarelli*[*]

1. Introduction

Over the last decade the European authorities have provided new regulatory solutions (so-called indirect market tools) to improve the coordination and increase transparency along the supply chain, such as Interbranch organization (IBO), extension of rules and Regulation of supply for PDO products and so on (Frascarelli, 2012).

According to the transaction costs theory (TC), these tools may be approached as institutionally embedded hybrid forms of governance that establish a centralized and compulsory negotiation between partners and impose various conditions regarding product distribution and supply management (Royer et al., 2012; 2016). Three main characteristics play a key role in hybrids: first, parties pool part of their resources, while keeping their property rights and their associated decision rights distinct, which makes crucial the selection of partners; second, the main mechanism implemented for coordinating parties who keep their rights of decisions separate is contractual and third, competition persists among partners to hybrid arrangements (Menard and Valceschini, 2005).

These organizational solutions adopted in the agro-food sector could allow reducing opportunistic behaviour, enforce contractual arrangements and improve coordination so that economic agents can better adapt supply to demand in the long run (Williamson and Klein, 2004). Literature on hybrids is quite unanimous about the role played by uncertainty in decisions regarding the level at which partners will pool resource. If we assume competitive markets, problems with inputs are often connected to issues of quality, quality

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 ISBN 9788891786883

control and the risk of free-riding. Of course, uncertainty may also result from factors exogenous to the arrangement such as the institutional environment (e.g., the new CAP reform) that influences the choice to prefer a hybrid mode of organization rather than markets or integration, as well as the choice of a specific form of hybrid (Menard, 2004). However, among the determinants of hybrid arrangements, uncertainty is secondary to the existence of specific investments. Indeed, without at least a minimal degree of mutual dependence in assets, there would be no hybrid arrangement properly speaking. It follows that the more specific mutual investments are for both parties, the higher are the risks of opportunistic behavior and the tighter are the forms of control implemented.

2. Aim and methodology

Under the lens of the TC, the present work aims to analyse how the CAP affect the adoption of organizational solutions in some Italian agro-food chains characterized by high value added and high level of employment (Ciliberti and Frascarelli, 2016; Chiodini and Frascarelli, 2017). In more details, attention is paid on two specific policy tools that gained momentum thanks to the Reg. (EU) 1308/2013 (e.g. CMO regulation): the extension of rules in the context of IBO (and similar) agreements and the regulation of supply of PDO/PGI cheese implemented by Protection Consortia.

In order to investigate the impact of these collective arrangements on the main determinants of hybrids forms of governance a multiple holistic case study design is adopted. It follows that design entails three case studies (related to three different sectors: tobacco, cheese and wine) that deal with single units of analysis. More in details, the units of analyses are:

- the IBO "Tabacco Italia" for the tobacco sector,
- the Protection Consortium of Grana Padano PDO for the cheese sector,
- the Protection Consortium of the "Vino Nobile di Montepulciano" for the wine sector.

With respect to materials, the reliability of the case studies is substantiated by means of the well-known triangulation of evidence. The information gathering was conducted from April 2015 to July 2017 using three main sources of evidence: documents, multiple (direct and participant) observations and open-ended interviews.

3. Main findings

Results show that there are significant differences related to the level of products differentiations and the diversification of commercial channels. This is due to the fact that whereas on the one hand PDO/PGI cheese and high-quality wines are highly differentiated products, on the other hand tobacco is an international commodity. As a consequence, market is more fragmented for cheese and wine than for tobacco. As regards similarities, it must be noted that the level of asset specificity however is very high for all the considered sectors as well as these latter are all characterized by a medium (cheese and wine) or high (tobacco) degree of uncertainty surrounding the transactions related to market trends, consumers attitude and the regulatory framework (e.g. CAP) as well.

In more details, the paper shed lights on the only three sectors where extension of rules (and fees) is applied (with the only exception of the kiwi sector in 2014. This fact confirms that the use of such a policy tool remains still an exception in the Italy. However, results highlights that the application of extension of fees allows long-term funding of the IBOs or Protection Consortia, whereas in absence of such an extension activities are limited to the point that these hybrid forms of governance have no impact in the supply chain.

In both case studies of PDO Grana Padano and Nobile di Montepulciano wine, production management activities are fostered by the presence of a certification of quality (based on Reg. EU 1151/2012). Therefore, in these cases the Protection Consortia establishes rules for farmers that own the right to use the PDO/PGI marks in order to regulating the supply. As for enforcement, the Consortia has the power to provide or not the producers with the PDO/PGI mark. On the other hand, in the tobacco sector the extension of rules has been adopted by the IBO, in presence of a commodity crop without (or with low) possibility of differentiation for the final product. In absence of specific marks the enforcement of the IBO agreement, extended to non-members, is guaranteed by means of financial penalties and sanctions.

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SMALL FARMING ROLE TO FOOD AND NUTRITION SECURITY IN FOOD SYSTEMS: A CASE STUDY IN TUSCANY

by *Francesca Galli*[*], *Laura Fastelli*[**], *Lucia Palmioli*[**], *Francesco Di Iacovo*[***] and *Gianluca Brunori*[**]

1. Introduction

The debate on structural change in farming and the implications for the competitiveness and sustainability of the agri-food sector and the rural areas has revived in recent years (DG Agri, 2015). Notably, the "International Year of Family and Smallholder Farming" was aimed at "focusing attention on family and smallholder farming worldwide, and their significant role in eradicating hunger and poverty, providing food security and nutrition, improving livelihoods, managing natural resources, protecting the environment, and achieving sustainable development, especially in rural areas" (FAO, 2014).

Despite European agriculture being characterized by a declining number of agricultural holdings and an increase in farm size, the agricultural sector is largely composed by farms with less than 5 ha of agricultural land and a standard output below 4 000 euro per year (Eurostat, 2015). A commonly agreed definition of small farms does not exist (EC, 2011), as different criteria can be referred to, including economic size, value of production, labor units and family involvement (Hubbard, 2009). Smaller farms are often operated as family-run businesses, passed through generations, and most labor input in agriculture derives from members of the family. Often, small family farms turn to off-farm employment, and many more receive social welfare transfers (i.e. pensions). There is recognition that small farms make up an important share of total agricultural employment and play an important role in many rural economies particularly in more fragile and disadvantaged regions (EC, 2014).

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 ISBN 9788891786883

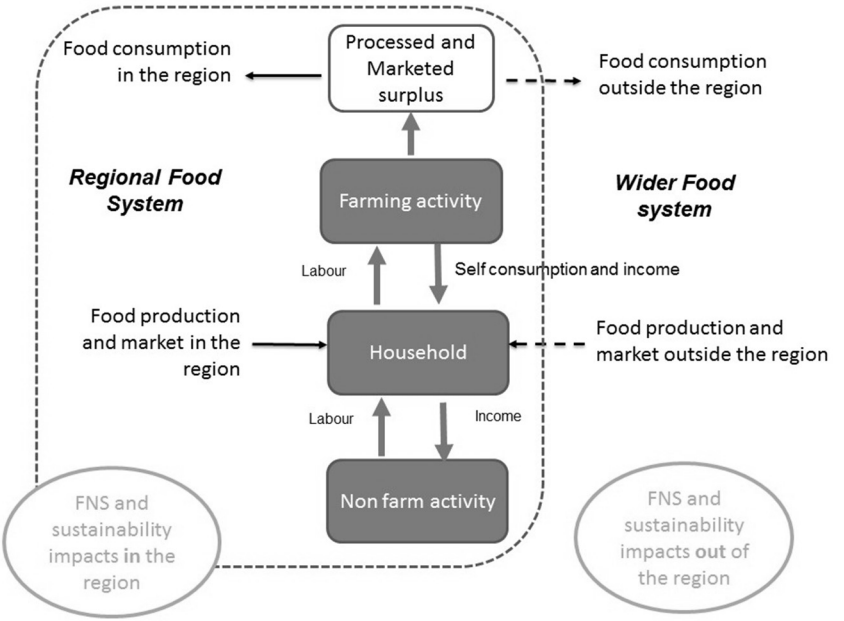
There is a call for research aimed at improving the understanding on the role of small farms and food businesses in food and nutrition security and their resilience to shocks in an increasingly complex and uncertain world (HLPE, 2013; FAO, 2006). The connections between family farming, small farms and food and nutrition security – in the dimensions of availability, access, utilization and stability – fairly documented in developing countries (Riesgo et al. 2016), and in new member states (Davidova, 2012), are recognized also by the European Commission (EC, 2014). This contribution develops within the H2020 research project SALSA, "Small farms, small food businesses and sustainable food and nutrition security", which addresses the question: what is the distinctive role of small(er) farms in relation to food and nutrition security in different regions? This paper presents the conceptual framework adopted in the project and an illustration in one of the regions covered by the research.

2. Materials and methods

The project adopts a systemic conceptual framework and approach to explore the contribution of small farms and small food businesses to food system outcomes in a range of 30 reference areas, at NUTS 3 level, both in Europe and Africa, as synthetized in Fig. 1 (see Grando et al. 2016).

The methodology comprises two main steps: an exploratory phase, in which 30 selected territorial food systems (NUTS 3 level) are characterized in terms of self-sufficiency or dependency, by developing a "balance sheet" on production and consumption sides. Within a situation of surplus/deficit, the relevance of small farming is assessed (drawing upon secondary statistics). This is complemented by in-depth interviews with key informants on food system dynamics at regional level (NUT 3). In a second step, a participatory mapping is developed to represent structures, relations and processes of territorial food systems (for selected food products). This exercise is followed by in-depth interviews with small farmers and focus groups with stakeholders to get in-depth insights at product level. A final workshop is organized at regional level to discuss and validate the findings. Following, we illustrate a preliminary study within one of the 30 reference regions selected in the project (Lucca province in Tuscany region, Italy).

Fig. 1 – A territorial food system view



3. Results

The balance sheet shows that across all farming sectors, local production is insufficient to satisfy the estimated consumption and secondly, that small farms contribute relatively more to producing some products than others (Figure 2). Based on this preliminary analysis, smaller farms contribution is very diversified across different types of production. For example, in the fresh vegetable supply, in the territory at stake, their contribution is prevalent, while for fruit or meat (for which there is a lack of supply) they play a much more limited role. The staple foods selected for Lucca are olive oil, fruits, wine and vegetables.

Fig. 2 – Synthesis of regional food balance sheet and role of small farms in food staples production

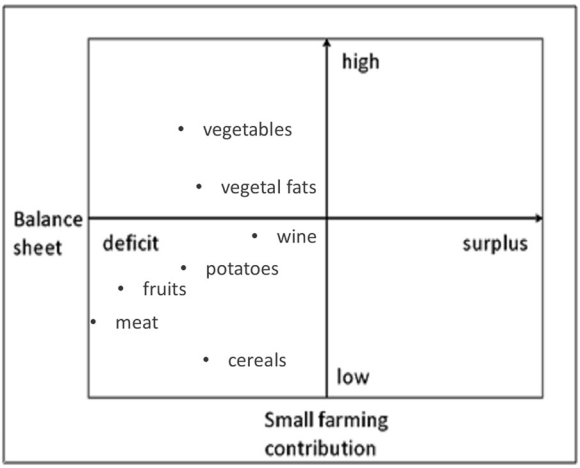
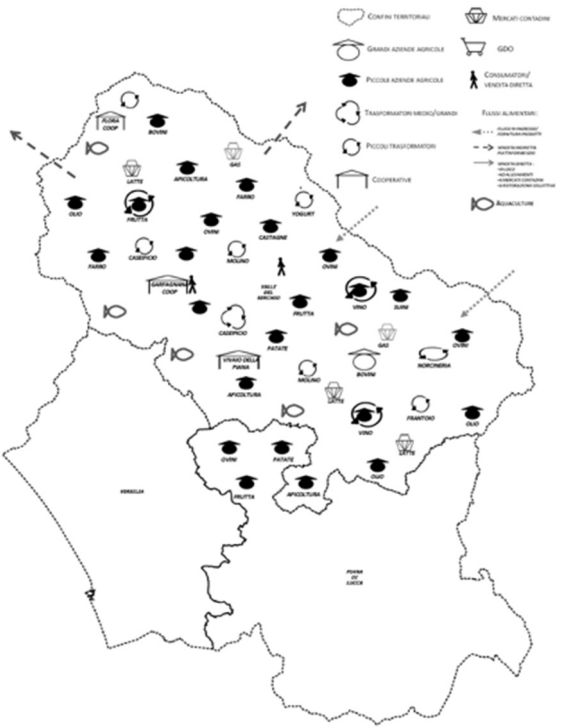


Figure 3 illustrates a mapping exercise output developed for a sub-area of Lucca province (i.e. in Garfagnana, remote and mountainous area). The mapping reveals some important gaps: for example, the networking relationships among local farmers, especially the ones located in more marginalized and mountainous areas are sometimes hindered by the closure of markets over time and the lack of collective situations that provide a chance of encounter. This is particularly relevant for young farmers that also have a strong need for training and support, when they do not have a professional background in agriculture, but often have a strong passion that has driven them back to the countryside. Other relevant gaps emerge between local farmers and restaurants: sometimes local products are not prioritized due to lack of quantity and convenience. In relation to beer made of spelt, for example, the territorial brand "Garfagnana" is exploited, but the raw material used to produce beer does not come from the territory.

Fig. 3 – Example of participatory food system mapping, Garfagnana area (Lucca).

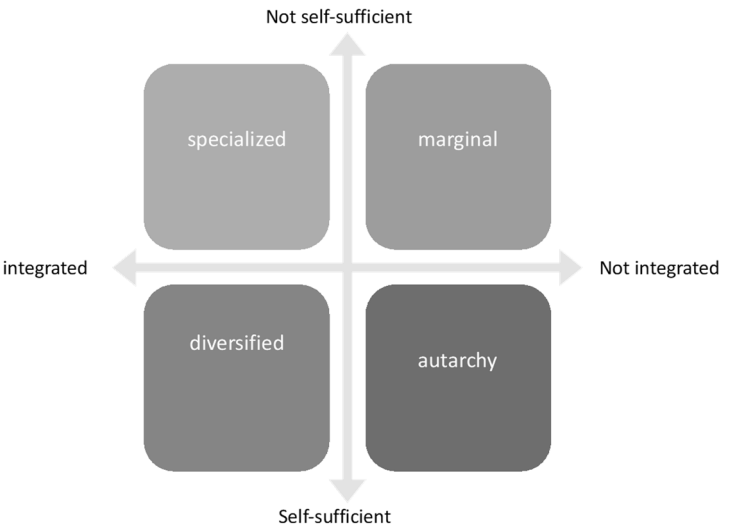


The in-depth interviews aimed to understand the way farmers perceive their contribution to food system outcomes. In-depth interviews with selected farmers, included the more "invisible" cases to account for the different strategies for subsistence and sustainability. Based on the 40 interviews (32 small farms, 8 small food businesses), we developed a typology of small farmers, along two key variables: self-provisioning (the degree to which farming satisfies farm household consumption needs) and market integration (the degree to which farming is oriented to the market), see Fig. 4.

For the "marginal" type, agriculture is a residual activity in the household, characterized by a low self-sufficiency and low market integration. These farmers usually do not process their products and depend on intermediaries for the product that they sell. Having a rather low productivity, usually they are quite specialized into one or a few products and their production is mostly self- consumed. The second type, "autarchic" farmers are self-sufficient but not much market integrated. One or more of the following features can be found: very diversified, oriented to satisfy the household consumption; horticulture usually sided by animal breeding (i.e. poultry, courtyard animals).

The third type is labeled "specialized", with low self-sufficiency but strong market integrated: highly specialized and market oriented, they process products and are integrated in multiple marketing channels. The last type is "diversified": these virtuous farmers are often oriented to quality production and they also self-consume their product but hold enough value-added quantities to succeed on the market.

Fig. 4 – Small farmers typology in Lucca



4. Concluding remarks

This research seeks to explore how small farms bring a distinctive contribution to food systems, food and nutrition security and environmental and socio-economic outcomes. Drawing from the conceptual framework and methodology adopted in the project, this paper provides an illustration on a preliminary case study within one of the reference regions selected. We address Lucca province in Tuscany, combining quantitative and qualitative research. Preliminary results indicate that small farms contribute to food availability by producing food on marginalized land (e.g. in remote and mountainous areas). They can improve access to fresh and products through their involvement in local production and distribution and are a key component of household income generation and stabilization. By connecting directly with

food businesses, establishing local and niche markets they contribute to food utilization by ensuring stability of supply and establishing relationships to urban consumers. The comparative analysis across the 30 reference regions in the project will allow to advance available knowledge and obtain rich insights on cross cutting features, relevance and impacts of small farming across Europe.

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HOW REGIONAL CLUSTERS CAN FOSTER THE INNOVATION? LINKS AND DRIVERS RELATED TO INNOVATIVE OUTPUT IN THE AGRIFOOD SECTOR

by *Adele Finco*[*], *Deborah Bentivoglio*[**] and *Giorgia Bucci*[*]

1. Introduction and objectives

Nowadays innovation is a central driver of economic growth and productivity. The capacity to innovate is a strategic tool for those firms that want to maintain their competitive position in the global market (De Jong et al., 2004; Laforet and Tann 2006). This is especially true for the agrifood sector that is the largest manufacturing sector within the EU (Traill, 1998; Menrad, 2004;) even if it has traditionally been viewed as a low-tech sector with slow rates of innovation compared to other sectors (Christensen et al., 1996; Grunert et al., 1997; Dalla Corte et al, 2015; Bentivoglio et al., 2016). According to OECD, innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. However, in the agro-food domain, innovation is perceived in different aspects as new feeding systems, new types of packaging, new types of conservation, new additives, new consumer products introduced continuously on the market (e.g. functional food), and food chain management. (Nielsen, 2008; Christensen et al., 2008). In this context, Horizon 2020 and new Common Agricultural Policy (CAP) 2014-2020 (Reg. EU 1305/2013; art. 53. 55, 56, 57) emphasized the role of innovation. In details, the new Rural Development Policy introduced new instruments as the European Innovation Partnership (EIP), the Operational Groups (OGs) and different technological clusters to encourage and transfer innovation over the coming decade.

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 ISBN 9788891786883

This research aims to explore some of determinants of innovation among a sample of agrifood SMEs associated with Cluster Agrifood Marche. The analysis is carried out based on information collected through a questionnaire survey. A multiple linear regression was run to assess the link between innovation and the factors influencing the innovative ca-pacity of firms. In particular, this study have evaluated innovation in term of R&D expenditure as a percentage of revenue.

2. Data and Method

A web questionnaire was developed and send by mail to Cluster Agrifood Marche members (ClAM). The questionnaire was divided in two parts. The first part aimed to investigate the propensity of firms to innovate evaluating 3 aspects: participation in research and innovation projects, fields of innovation and R&D expenditure as a percentage of revenue. In the second part we collected all the variables that could influence the level of innovation. In order to identify the determinants of innovation in the agro-food SMEs, a multiple linear regression method was applied with R&D expenditure as the dependent variable and the following factors taken as independents variables: firm's age, firm turnover, number of employees, age of the entrepreneur, entrepreneur gender.

3. Results and discussion

The first step of this research was to gain knowledge on the propensity of innovation of the firms included in the ClAM. ClAM includes different subjects (such as Universities, Research Institutions, local companies, association, service companies and professional associations) in order to connect the local production needs to regional innovation policy. For the purpose of the current analysis, we isolated data only for the agro-food SMEs. The final sample was composed by 23 firms. 39% of the sample has participated in research and innovation projects, mainly at Regional level (52%).

With regard to fields of innovation, the majority of the sample (21%) has found new market opportunities to sell its products. The second most relevant field of innovation is the creation of functional food (18%) follows by the development of new process for optimizing the production (19%). The innovators in the sample dedicate on average a 0.7 percent of their total

turnover to research and development especially in new or improved products to bring to market.

All the variables collected in the second part of the questionnaire are used to implement the multiple linear regression and the result was that the most influential factors which affect innovation are number of employees and firm's turnover. The study of the relationship between firm size and innovation also goes back to Schumpeter. Since then, several theoretical studies have claimed that larger companies have major potential factors such as economies of scale, lower risk, a larger market and greater opportunities for appropriation, which enable them to undertake sophisticated R&D projects and benefit from the innovations stemming from these activities. In addition, the results show that higher turnover is associated with a higher probability of being innovative. Turnover can be an important mechanism for R&D and innovation activities in firms. According to Eriksson, T. et al., (2014) as long as there is not sufficient flow of economic incentives, employee empowerment and involvement, and adoption of new information technologies can do little to radically change the innovation activities within the firm.

4. Conclusion

The results suggest that innovation is not a random process. The propensity for innovation depends on several variables. In particular, variables related to firm size and turnover are significantly related to the propensity to innovate. Although limitations for smaller companies to innovate, innovative behavior will be required to ensure competitiveness. In this context, the participation in a networks, as Clusters, could be seen as a successful way to increase the chances to compete. Regional clusters agglomerate different local stakeholders in a particular-lar geographical area that simultaneously collaborate and create new synergies to spread the innovation and to gain different economic ad-vantages as local development. The participation in cooperation networks can stimulate and reinforce innovative attitudes within firms, as actors access a wider set of information and knowledge. Strategically, networking should be perceived as a permanent activity of a firm and should become an implicit element in its continuous decision-making processes.

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REGIONAL NODES IN EUROPEAN AREAS TO BOOST INNOVATION TRANSFER AND KNOWLEDGE UPTAKE. A SOCIAL NETWORK ANALYSIS OF BUILDING RELATIONSHIPS IN "SHORT FOOD SUPPLY CHAIN KNOWLEDGE AND INNOVATION NETWORK (SKIN)" – H2020 PROJECT

by *Gianluigi De Pascale*[*], *Fedele Colantuono*[**], *Piermichele La Sala*[**] and *Francesco Contò*[**]

1. Introduction

European Commission (EC) has strong commitments in fostering sustainable growth, as proposed within the Europe 2020 program. Going through such program, it emerges that the European areas often present different features and problems to be faced. It occurs the need to piece together efforts in order to build strong infrastructures making capable the food supply chain operators to engage synergies by a system putting in contacts actors from different European areas. SKIN project is an H2020 project already approved by the EC. It focuses on the assessment of good practices in Short Food Supply Chain (SFSC). The main features of such good practices will be spread in as much as possible European areas through strong networks that will be established. SFSC is one of the relevant topics raised within the EIP-AGRI Focus Group. The Focus Group is composed by experts and experienced people that have gathered their contributes and got conclusions inspiring the project ideas. Regional nodes have been arisen as a fundamental part of SKIN project. In fact, after preliminary phases aimed to assess, collect and store data, the emerging information will be grouped and managed by entities mentioned as regional nodes. This study aims at understanding whether the innovative SKIN methodology fits into the scientific evidence of the existing literature.

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2. Materials and methods

SNA is the chosen method to investigate relationship features revealing the interaction intensity among actors operating in SFSC. One of the major question for which scholars have been spending studies, concern the more and more complexity that characterizes the relationships. This article advocates systematic review of the existing article of the domain of Social Network analysis. To do this, articles published on web of science and scopus database were sought. The undertaken study is actually grounded in the assumption of transferring knowledge through network. The literature review is aimed to compare the efficacy of the nodes to the edges.

3. Results and conclusions

A single regional node will deal with maintaining and consolidating the network pursuing to increase density, ties and expansion. In this regard, in long term, the foresights attain to realize that appearing community building will get in contact to existing others, involving operators of different sectors in order to make a robust economic system able to exploit interactions. The building network is an opportunity to exploit benefits from the actor' cooperation and to come up critical points within the relations describing the network. To this extent, the Social Network Analysis (SNA) will investigate territorial existing connections, using three levels of the methodology. The emerging critical points will be managed to improve the value of the linkages. In other words, the systematic review shows that the role of the node is often more relevant than the edge.

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HEALTH INNOVATION: THE DETERMINANTS OF THE ADOPTION OF ACTIVE AND INTELLIGENT PACKAGING IN FRESH-CUT FRUIT AND VEGETABLES

by *Biagia De Devitiis*[*], *Alessandro Muscio*[**], *Gianluca Nardone*[**], *Fabio Santeramo*[**], *Antonio Stasi*[**] and *Rosaria Viscecchia*[**]

1. Introduction

In food industry, where demand-led innovations are so important (Muscio et al., 2010), the ability to face consumers' sophisticated demand results not only in a direction towards more differentiated products but also in a competitive edge in global market (Porter, 1990). While a large body literature about innovation has investigated the drivers of innovation in many sectors, to the knowledge of the authors, not much has been done with respect to the food industry. The importance of firms' adoption of new technologies and innovations could have multiple and positive impacts on firms' operational activities: cost-reduction, product differentiation, process innovation, and improvements in managerial organization. The new shape of competition is pushing towards the application of strict rules and techniques for standardization, processes optimization, certifications and cost reduction in order to increase the international competitiveness. Through the past decades, consumers' awareness towards food safety issues, environment and ethical implications of productions has increased. Lately, the impact of the world economic crisis on purchasing power has been rising as well as the globalization, which is pushing towards an increasing internationalization of Italian food products. Seemingly, the competitive arena, regulation and policy incentives are pushing industry to increase R&D investments. Nonetheless, the adoption of new technologies could be also driven also by internal factors to the industry. Despite having great innovative potential, the food industry is generally based on "redundant technologies". Science and technology offer wide opportunities to change and improve taste of products, preparation and

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 ISBN 9788891786883

nutritional characteristics, but the industrial structure is generally composed of SMEs with low R&D capacity. In fact, the introduction of innovations in the food industry is strongly influenced by demand conditions. Although final consumers are getting every day more interested in food characteristics and are showing greater willingness to pay for new products, they do not change substantially their alimentary regime (Galizzi and Venturini, 1996). It follows that product innovations in the industry are hardly radical and much more often of incremental nature. Health innovation is one of the most recent "demand pull" innovations in food sector (De Devitiis et al., 2018). Based on these preliminary remarks, this paper provides new evidence on the determinants of the adoption of the newer technologies with specific reference to the fresh-cut fruits and vegetables. The fresh-cut sector has been developed as a response to consumers' demand for healthy, fresh-like and easy to prepare products (Baselice et al, 2017). Fresh-cut F&V are "minimally processed products; that is washed, cut, mixed and packed" (IFPA). The fresh-cut sector in Italy, during the 2016, recorded 725 millions of euro in value, growing 1,2% in value and 3% in volume in comparison with the previous year. During the first four mounths of 2017 sales gained about 7% in value and volume (ISMEA, 2017). Technological research on fresh-cut F&V is constantly evolving towards food safety characteristics and quality preservation techniques (Watada, & Qi, 1999; Salinas-Rocaet ,2016). One of the most innovative developments in the area of packaging is the 'active and intelligent' (A&I) packaging, based on deliberate interactions with the food or the food environment. This packaging arise from an idea of quality improvement, food preservation, and communication interface between producer and consumer, with the purpose of responding to the modern consumer needs of safer and healthier food. Active packaging refers to the incorporation of certain agents into packaging systems to improve food quality and safety and therefore extend their shelf-life (Hutton, 2003; Ahvenainen 2003). Intelligent packaging aims at giving indication on, and monitoring the freshness of the food. It gives information to the manufacturer, retailer and consumer based on its ability to sense, detect, or record external or internal changes in the product's environment (Hutton, 2003). The purpose of the study is to understand the determinants of the adoption of the active and intelligent packaging in fresh cut sector.

2. Materials and methods

The identified methodology involves the submission of a closed questionnaire to a sample of 43 fresh cut companies. In addition we interviewed others 59 fruit and vegetables firms largely involved in the packaging process and that are potentially interested in these new technologies. All the companies were located in Central-Southern Italy and were interviewed through the CAWI method. Most companies produce output with a medium to high perishability based on the respiratory rate. The questionnaire gathered general information on the companies, on demand factors, supply factors, technological and organizational capabilities, significance of regulation and standards. The most important applications of active and intelligent packaging in fruit and vegetable sector were investigated: Active Scavenging Systems (Oxygen, Carbon Dioxide, Ethylene Scavengers), Active preservative- releasing Systems, Time-temperature indicators, Freshness indicators, RDFI Technology, Food Sentinel System. We test the research hypothesis by employing a probit regression that estimates the correlation between the drivers of health-innovation and the probability of adopting 6 different applications of Active & Intelligent packaging. This regression is compared, then, to the ordered probit regression that measures the probability that companies will introduce one or more of the six of the technological innovations in packaging discussed above. Statistical data processing has been estimated through the Stata13 software.

3. Results

Results confirm the positive impact of demand factors such as the importance to the health aspect of products. We find evidence in support of the positive impact of percentage of exported products. New evidence in support of the positive impact of the ability of the company to understand the importance of such technologies, used as proxy of absorptive capacity. Historical information on companies rather than a cross-section might be desirable to obtain more robust evidence. Further research could focus on in depth qualitative analysis of the correlations found in this study to provide a clearer understanding of the mechanisms driving them.

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NATURALLY GM: THE DEVELOPMENT OF NEW BREEDING TECHNIQUES THROUGH PATENT DATA ANALYSIS

by *Dario G. Frisio*[*] and *Vera Ventura*[**]

1. Introduction

Plant biotechnologies are considered one of the most promising innovation sector in agriculture and during the last decade the development of a new wave of breeding techniques (NBTs) have rapidly emerged, thus changing the scenario of crop improvement. Modern agriculture can benefit from the introduction of NBT for their impact in the reduction of greenhouse gas emissions, the improvement of water use efficiency and the control of production losses (Schaart et al., 2016). In addition products derived from NBT can potentially mitigate public aversion for genetic modification in plants and food, mainly due to the fact that this new technologies are perceived as more natural with respect to the transgenic approach. At European level, the possibility of the inclusion of NBTs within the scope of EU legislation on genetically modified organisms (GMOs) is currently raising a huge debate within the scientific community, for the technical, social and economic implications of this scenario (Schiemann and Hartung, 2014; Sprink et al., 2016; Lusser and Davies, 2013; Araki and Ishii, 2015). Moreover, the European plant breeding industry is a world leader in terms of innovation, representing a market value of more around $ 9.7 billion (€ 8.6 billion). A significant share of the more than 7,000 companies in the EU seed sector are Small-to-Medium-Size Enterprises (SMEs) that depend on innovation and access to technology to remain competitive (Ragonnaud, 2013). Nevertheless, the economic impact of agbiotech innovation in NBT have been scarcely investigated (Lusser et al., 2012).

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2. Materials and methods

In this article, the structure of patent landscape of NBT agricultural applications have been examined to assess the impacts of this technology, the concentration of the R&D-related activity and the technological competitiveness of the public sector's contribution, with a specific focus on the European Union.

The analysis has been carried out by mining Espacenet patent database (2000-2017) through specific keywords for the identification of NBT-related patents and limiting the search to a number of International Patent Classification (IPC) classes associated with the applications of NBT inventions in plants, focusing on the most important and the main Patent Systems. The final dataset is composed of 526 original inventions, original patent firstly filed worldwide, basing on priority number and date. By contrast, subsequent filing of the same invention in different systems are defined patents.

3. Results

Results outlined that new breeding technologies are endowed with elements of novelty in many aspects of their development. More specifically, time trends outlined that NBTs are no doubt emerging technologies: the total number of inventions evolved from 38 in the first years, to 176 in the last three year period. NBT show the most traditional pattern of innovation composed of a preliminary phase of process development followed by a shift toward products. Indeed, if NBT inventions related to methods (i.e. for gene transfer, gene sequences manipulation, expression) represent the 60% of patenting activity in the first years, their weight decrease to 40% in the most recent period. As for the type of technology, data show a decrease in the application of certain NBTs (zinc finger, agroinfiltration) and, conversely, a quite impressive boost in CRISPR inventions.

The use of NBT for plant breeding is aimed at conferring a wide variety of traits. The main type of plant improvement relates to stress resistance (22%, 56 inventions). Indeed, the enhancement of plant agronomic properties to better perform in condition of drought, as well as in high salinity soils, is a field of research that makes NBT one of the most promising technologies for climate change adaptation. Herbicide Tolerance (HT) and Insect Resistance (IR), the traits modification that received the highest diffusion worldwide through GM cultivation, only account for 4% of inventions. Thus, data shows that when compared to transgenic applications, NBT are going to be developed and

applied for a significantly broader spectrum of purposes, thus giving evidence of the high adaptability of these technologies. A further aspect that distinguish NBTs from the traditional transgenic technology is the type of players involved in R&D. The "Big Six" agbiotech companies are not still playing a leading role: their contribution represent the 13% of total patenting activity. Moreover, within them, a different degree of specialization in NBT R&D can be recognized, DuPont and DowAgrosciences being the most interested in investing in the development of NBT technology. Globally, almost 55% percent of the total patent activity derives from public research R&D. Country trends reveal that until 2009 this technology was principally owned and developed by US and European Applicants. After that, the patenting activity in China rapidly escalated and surpassed the original developers. Though, in Europe NBTs research and development remained at a considerably lower level, when compared to the other Countries. European Member States are showing an opposite trend over years, with a significant decline in the number of inventions. This aspect is of paramount importance for its future implications on European R&D competitiveness in agbiotech, not least considering the marginal role played by EU public R&D (24.5%).

In conclusion, the analysis of NBTs patent data outlines that this new set of technologies are quite probably going to depict a new scenario in the agbiotech sector. Moreover, seminal studies are showing that consumer perception and acceptance of NBT is greater if compared to GMOs, thus opening the way to their development and commercialization in the European Union. In this sense, NBT are not an innovation only in technological terms, and the innovative features they present have the potential to reshape the global socio-economic impact of plant genetic improvement.

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SUPPORTING INTERACTIVE APPROACH AND COOPERATION IN AGRICULTURAL INNOVATION: METHODS AND TOOLS WITHIN THE EU POLICY CONTEXT

by *Elena Favilli*[*] and *Gianluca Brunori*[**]

1. Introduction

It is widely acknowledged that innovation in agriculture and rural development need to be adequately fostered; within a System Approach to the matter (World Bank 2012), the cooperation among different individuals and organizations is recognized as a key element in an innovation process (Klerkx et al. 2013) and it is based on the concept of interactive innovation. This model emphasizes the system of relations between relevant actors in an innovation process (research, extensions, farmers, consumers, public authorities), observing a connection between organizational, technological and institutional factors (Coffey et al. 2016).

There is an EU-wide strategic orientation in policies towards an economic growth that relies on innovations, sustainability, smart and inclusive knowledge and learning systems (COM 2010).

In the agricultural sector this quest is translated into crosscutting rural development priorities (e.g. fostering knowledge transfer and innovation, promoting innovative farm technologies etc.) and in the EIP-Agri initiative (COM 2012).

The scientific debate on the issue of institutional change towards an interactive innovation model is also focused on the interactions and inter-dependences between policies, as they affect the extent to which intended outcomes are achieved.

However, there is no blueprint for successful innovation processes, as the influencing factors are manifold and situation-specific (Rogers 2003).

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 ISBN 9788891786883

Moreover, despite the general agreement on strategies and main objectives both at European and National/Regional level, the desired change which is needed to integrate different instruments, actors and competences still presents obstacles.

This paper intends to contribute to the debate on innovation policy in agriculture and rural development by presenting results arising from the H2020 Thematic Network AgriSpin (GA 652642), which was aimed at improving European agriculture innovation support systems. We specifically addressed the way EU policy instruments support the interactive innovation approach in agriculture and rural development, aiming at identifying implementation problems and providing rooms for improvements.

2. Materials and methods

The research relies on the results of the AgriSpin project, primarily on the involvement of 12 relevant experts belonging to European public authorities (i.e. national and regional governments) and advisory services organizations into a discussion group, named Multiplier Group (MG).

Data were collected through desk research and consultations with experts involved in the MG. Firstly, a preliminary study of the literature on Agricultural Innovation Systems, interactive innovation, systemic change and innovation policy has been realized. This study feeded the consultations with the MG, which met twice in the period from September 2016 to March 2017.

The first meeting was intended to identify interactive innovation approach implementation problems; the second meeting was aimed at developing a set of recommendations and suggestions for the improvement of the system.

In between the two meetings, experts were also asked to reflect on possible strategies to foster interactive innovation in agriculture within funding instruments available at EU level.

We provided a questionnaire to be answered on-line, with some guiding questions addressing the weaknesses of the current system of support to interactive innovation and possible ways to improve it.

3. Results

The study has identified a set of interactive innovation implementation problems: firstly, cooperation amongst different actors and sectors grounded

on a co-creation approach requires an alignment on visions and perspective, and this is highly tricky when the innovation system is not well coordinated. In fact, one of the main identified weakness of the system concerns the engagement of Public Authorities in fostering interactive innovation in agriculture: current administrative systems often doesn't fit with a new way of thinking about supporting innovation and this represent a barrier to change.

This weakness is also evident when implementing policy instruments currently available to support interactive innovation, namely EIP-Agri tools within Rural Development Plans. The desired coherence of the EIP-Agri system doesn't realize in practice, as the different support actions are often not coordinated (e.g. support to network, Operational Groups, and advisory services). The study allows however to suggest preliminary, general recommendations in order to improve the functioning of the agricultural innovation support system, such as: fostering cross-border cooperation activities, in order to facilitate dialogue and vision of the actors involved, and working towards a better integration of existing policy tools. The interactive innovation model also entails coordination between policies and the "innovation policy mix" concept may allow to build a coherent agricultural policy frame (Flanagan et al. 2011; Borrás and Edquist 2013).

Results have also led to identify in the "innovation ecosystem" (Pigford et al., 2018) an inspiring concept to move towards, as it allows to address several practice issues concerning the implementation of the interactive innovation model. It identifies interactivity between different sectors and systems as a key aspect affecting agricultural outcomes and the idea of innovation community, to be further explored, may provide an overall frame to organise European agricultural innovation support system.

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THE TERRITORIAL MANAGEMENT CONTRACTS: SHARING SOLUTION OF SUSTAINABLE MANAGEMENT AND PROMOTION OF TERRITORY

by *Adriano Ciani*[*]

1. Introduction

The World Economic crisis from 2007 left us a dramatic situation where the role of Public Intistutions to manage the Territory and provide at the needs of populations is more and more week and problematic. This trend joint at the Climate Change and the Strategy of Sustainable Development (UNGASS, 2015) push the local areas to research and experiment new possible ways to solve the question of the adaptation at the Climate Change and to garantee, for the future generation, the conservation and promotion of all potentialities of each territory and identary areas.

The Single Strategic Framework of the EU emanates the various Funds (ERDF, EAFRD, ESF, etc.), which put the focus of the various strategies on economic mechanisms that encourage active participation (to the objectives of various policies) of citizens and communities, guaranteed to operate with "good practices" for achieving those goals.

This analysis leads directly to the possible use, within this framework, of tools that, through the Mechanisms of Participated Programming, the Public and Private Management Contracts for the approach of Preventing Territory Management.

2. Targets, Methods and Materials

The present contribute have the aims try to present, at the agricultural economists and at the policymakers, at the National and International level,

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 ISBN 9788891786883

a scientific overwiev of the concrete possible innovative idea of New Governance of Territory suitable for the specificities of Italy but with the vision of the repeatibility and transferability in all the world.

The method is pertinent at the visionary approach of the research. It's an analysis arranged in an iterative and interactive process concerning the trend of the territorial situation in many countries This consequently taking into accounting particularly the metereological events joint at the initiatives to limits their negative effects that inspire, in a certainly step of the theoretical phases, the nnovative idea of the Territorial Management Contracts-TMC's.

2.1. Territory: Past, Present and Future

The past and current time don't have the proper concept of territory conseguently at the mistake of the prevalence use of the word of land.

The prevalence of the literature in English Language have done, for the past time, very rare sample of research regarding the territory. Till today continue the use of the word and approach at the *land*. But we must take into account that there is a very *big difference by soil, land and territory* (Sack, 1986; Raffestein, 1984; Ciani, 2012).

According to estimates, the global damage on the territory calculated for 2011 year amounted to over 311 billion dollars (IFRC, 2011).

Being innovative activities, the actions of territorial programming and planning must be carried out and strongly supported by an appropriate and widespread use of advanced instrumentation of Information and Communication Technology. Taking the territory into consideration is an indispensable way to guarantee the sustainable future of any activity in rural areas. The territory in its widest and most holistic form, together with man with his capacity to analyse, choose and operate together with humanity, in order to create the basic conditions for an indefeasible *New Renaissance* (Ciani, 2015).

The risk in the current time is that the territory could be affected, in relation also at the Climate Change effects, loss suddenly some identitary and rare territories as occurred in 2011 in the "Cinque Terre".

To participate in a proactive way at this challenges we need to put in practice some new model of the governance for a proper sustainable development in the all territories of the planet.

2.2. The challenge of the Territorial Contracts Management-TMC's Proposal

It's time to significantly change the mode of governing the issue. From an "*emergency management*" to an "*innovative management and preventive*" of the territory with a proactive participation and "*bottom up*" of those who operate on the same.

In theoretical approach the TMC's needs, first of all, to summarize that the implementation of the TMC's must pursue this following stakes: *a model of governance, instruments and supports for the decision making, strategic plan of the TMC, Project Financing* and *Project Management.*

The model of governance must be participative by the local population with the involvement of all stakeholders in the *ideation, design, project, implementation and monitoring* following the *iterative and interactive approach* (Ciani et al., 2012).

The proactive involvement of population must be manage by the economic instruments based on the techniques inspired by the approach of the Willing to Pay/Accept. In this way we can use the contingent evaluation or choice experiments. We must take into account that it will be a strictly connection with the very big question proposed by the European Union and by the Italian Government about the evaluations of the ecosystems services (EU Commission 2013; Italian Parliament, 2015).

3. Conclusions

The territory at this height must be considered a common good for which the responsibility of preserving the productive capacity of their physical, historical, cultural, identity integrity can, be referred to the Local Communities (first of all farmers). It'is way it's time to capture the New Paradigms and New Approaches that the Territory has to offer. As everyone knows, the European Union itself in 2014 began a process to develop, with the cooperation of the various States of the Union and of the various Local Governments, a Development Programmes, as a whole, for the period 2014-2020.This analysis leads us directly to use as possible, within this framework, tools that provide, through the mechanisms of Participatory Planning, Management Agreements between the Public and the Private to the preventive Management of the Territory. On these principles underpinning the strong assurance that the Territorial Management Contracts-TMC's can truly guarantee a new season at the Country for a preservation of its territory, to be a fundamental

part of people improvement the economic, environmental and social status. Some concrete cases, in different regions, appear suitable to implement possible experimental Pilot Projects. The idea of TMC's is therefore to transform the weakness of every area due to high risk, into an intelligent, inclusive, sustainable, transparent, proactive, concrete opportunity. To achieve for all rural areas of the world the character of Smart Communities and Smart Territory.

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VERTICAL COORDINATION AND CONTRACTS IN THE PORK INDUSTRY: FOCUS ON THE "GRAN SUINO ITALIANO" INTER-BRANCH ORGANISATION IN ITALY

by *Luca Camanzi*[*], *Giorgia Bartoli*[**] and *Giulio Malorgio*[***]

1. Introduction

The pig sector plays a strategic role in many EU Member States, and particularly in Italy, due to the high value of Italian dry-cured ham Protected Designations of Origin (PDOs), such as "Prosciutto di Parma" and "Prosciutto San Daniele".

However, vertical relationships in these supply chains, especially breeder-slaughterer relationships, are affected by a number of critical factors, including international competition in the supply of livestock, different profitability conditions and the weak concentration of primary supply as well as the scarce effectiveness of Inter-branch Organisations (IOs).

This research aims to point out stakeholders' perceptions of the current vertical coordination and bargaining power conditions in the pig sector, with a specific focus on the agricultural phase (breeders). The information provided will be useful to identify appropriate governance and contractual tools to improve efficiency and value distribution along the supply chain.

2. Conceptual framework

The study builds on an interpretative model drawing from the Structural-Functional Theory (SFT) (Parsons and Shils, 1975). SFT postulates that each social system to survive and maintain a balance must meet four functional prerequisites – Adaptation, Goal attainment, Integration and Latency.

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 ISBN 9788891786883

These conditions can be applied to vertical relationships in agri-food chains referring to the contributions provided by transaction cost theory and contract theory.

More precisely, modern agro-industrial contracts (Da Silva, 2005) can be considered as "adaptation" strategies used when the market is unable to provide, with low transaction costs, an appropriate correspondence between the supply of agricultural produce and the increasingly complex and specific demand from the processing industry. However, contracts may be incomplete, often due to asset specificity and free-riding behaviours (Hobbs and Young, 2000).

The “goal attainment” function brings us to consider the issue of the economic dependence of farmers on the other operators in the supply chain and the need to protect the weaker contractor, issues that have been only recently included in European and domestic policy orientation (Wu, 2006).

The “integration” function entails the identification of the conditions and the appropriate regulation that could avoid the occurrence of unilaterally and unobserved contractual terms to ensure a greater balance in business relationships (Raynaud and Valceschini, 2007).

As for the “latency” function, breeder-processors relationships are often conflicting due to the complexity involved in the “quality” implementation process needed to ensure certain attributes (organoleptic, nutritional, sanitary, etc.) (Raynaud et al., 2005).

Hence, four research hypotheses are formulated, as follows:

- Adaptation: Contracts are incomplete / clauses are not clear (H1);
- Goal attainment: Unfair commercial practices occur (H2);
- Integration: Contracts lack clauses balancing bargaining power (H3);
- Latency: There is no agreement on meat quality evaluation criteria (H4).

3. Methodology

To empirically test the research hypotheses formulated, a direct survey is conducted on farms belonging to the “Gran Suino Italiano” Inter-branch Organisation (IO), in Italy.

Questionnaires are submitted to breeders with more than 100 livestock units and to those which selling directly to processors (114 farms). A 30.7% response rate is obtained (35 replies). Despite its limited size, the sample provides significant information on the subsector as the respondents account for about 20% of total farms and 55% of the total livestock of the IO.

The questionnaire administered is divided into four parts, each corresponding to the above-mentioned hypotheses. Responses to all items were based on a 5-point Likert scale.

Information gathered is processed by means of a cluster analysis, based on the routine use of legal clauses, and Kruskal-Wallis (H) tests to assess the use of contracts in producer-processor transactions.

4. Expected results

The survey is expected to provide interesting insights on farmers' opinion about the use of contracts in the pig industry.

Preliminary results show that overall farmers only partially use written contracts and, where present, these are limited to being individual and not in aggregate form. More in detail, according to respondents, the use of contracts has some relevant limitations. As a first issue, the definition of non-compliance and of quantity covered by the periodic supply are indicated as the most unclear clauses (H1). Further, while interviewees report that unfair commercial practices (H2) are not frequent, they agree that the most relevant clauses (H3) are those concerning dispute management. Finally, the criteria used to evaluate the quality of carcasses are considered highly important (H4) and particularly the issue of a periodic calibration of scales in slaughterhouses and the certainty in the calculation of weight used to determine the yield.

The cluster analysis performed identified four homogenous groups of farms. Although the presence of legal clauses in the contracts signed by respondents is rather differentiated, 69% of respondents belong to the two clusters where legal protection is almost completely absent or present in an extremely limited way.

The opinions expressed by respondents in each cluster are significantly different from each other only in relation to four variables, concerning H1, H2 and H4.

In light of these results, the most appropriate solution to improve the current contractual relationships between breeders and processors in the pig industry could be to introduce a new contract scheme within the Inter-branch Organization. The new contract scheme could bind the parties to the signing of an agreement on cases of non-compliance and the characteristics of the livestock animals. Overall, an inter-branch agreement between the parties could be helpful defining what can be sanctioned with the related quantification of the sanction.

A further solution may be to set up a mediation commission on trade issues that may arise between the parties involved in a commercial transaction, as already happens, for example, in French inter-branch bodies.

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ALTERNATIVE FOOD NETWORKS IN WEST CORK (IRELAND)

by *Caterina Benvenuto*[*] and *Lucia Piani*[**]

1. Introduction

In the twentieth century, the processes of industrialization and standardization of the agri-food system led to what has been called "the quality turn" (Murdoch et al., 2000; Marsden, 2000; Sage, 2003; Goodman, 2003) and a wide range of realities and networks denominated Alternative Food Networks (AFN) started to develop worldwide. These offer alternative production and distribution processes where the focus is on local size, territorial embeddedness, quality and the development of community relations (Marsden et al. 2000; Renting et al., 2003).

This paper focuses on AFNs in West Cork (southwest of Ireland) which was subject to a migratory phenomenon from the 60-70s by non-Irish people. These migrants, called "blow-ins" have had a fundamental role in the development of this territory. We attempted to understand the link between the blow-ins and the development of highly rooted productive realities that can be traced back to AFNs.

2. Methodology

The study aimed to build a framework for small-medium scale food production activities in West Cork in the year 2015 with characteristics that could be considered AFNs.

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 ISBN 9788891786883

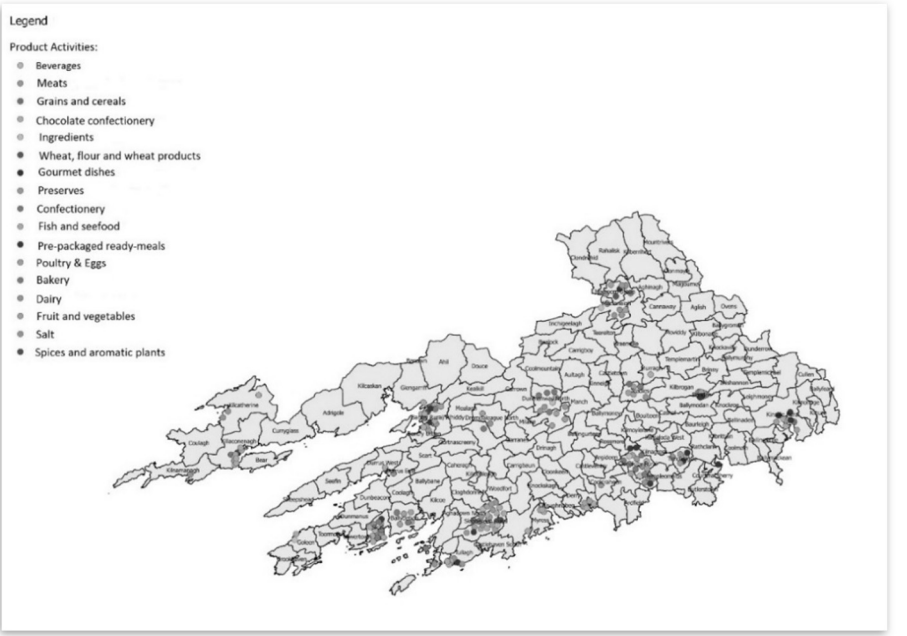
For the realization of the database, in addition to the studies and researches on the topic, several sources such as brochures, analysis of participation in local events and sites involved in the activity of e-commerce. 196 activities were surveyed were used.

Subsequently, a series of interviews were carried out in the months of August and September 2015, focusing on the basis of a flexible and non-standardized questionnaire scheme for individuals identified as blow-ins through their birth. Twenty-two interviews were conducted. The number of interviews appeared to be in line with the criterion of saturation proposed by Bertaux according to which it saturation is reached when, progressing with the interviews, the interviewer has the impression that the same themes and motives continue to appear (Niero, 1995).

3. The Alternative Food Networks and "blow-ins" in West Cork

Activities that are recorded with their geographical position (184 of 196) and their division according to product categories (17 categories) are distributed mainly along the coast (fig. 1)

Fig. 1 – Distribution of productive activities



Most of the productive activities are therefore quite recent, 20-30 years of experience. They are from 11 nationalities with British being 20% of the total.

The concentration of small and medium-sized activity related to AFNs found by this analysis confirms the trend identified by studies from the late 1990s (McDonagh et al., 1999; McIntyre B., 2000; Sage, 2003). One of the reasons for the development of AFN in this territory is the migratory phenomenon that took place in the 1960s, that has led to the establishment in the area of a "blow-in" community. Most of the "blow-ins" settled here to live an alternative life style. They found West Cork to be a place in which they could express themselves and live according to their personal values, attracted by the poor urbanization of the area, the freedom due to poor regulation, the low price of the land (O'Keeffe B., 1995; Stead D. R., 2011) and acceptance by the local community (Ospina, 2011). Hagarty (1994) describes this community as "conterurban and contercultural", which has arrived in Ireland "to be their own person" and "to do their own things" (Hopkins, 2008).

Many of them began to produce and sell goods, especially vegetables and organic fruits, which were not found in local stores and were not known by the local community (McDonagh et al., 1999). The birth of these activities has led to an increase in the variety of products offered with a further expansion of the Irish diet.

Blow-ins delete also started these activities in contrast to the logic of conventional agro-food businesses motivated by alternative principles related to the self-sufficiency movement (McDonagh et al., 1999).

The supplies appears to be mainly within the territory of West Cork and County of Cork through direct sales, farmer's markets or small shops. Several products have, however, managed to step out of the local market and also sell at national and international level and within the large-scale distribution. This shows that the current trend of AFNs is no longer antagonistic to that large distribution but converges and coexists with the latter (Marsden et al., 2000).

Higher values of between 10-20% for the non-Irish population (census of 2011) were observed predominantly along the coast and to the east. Skibbereen, Clonakilty, Bantry, Bandon, Kinsale and Castletownbere, areas in which a strong productive activity can be noted, coincide with the areas where there is a strong presence of a foreign population (16-23%.) In the hinterland, where activities are less concentrated, these are mainly distributed in Macroom and Bandon and Dunmanway (10-15%). In other areas where the presence of foreign nationality is less than 10% productive activities were not detected.

Caroline Crowley, expert in rural planning, states that the presence of a foreign component in an area is an element that strongly determines the evo-

lution of the territory. She noted that in areas with characteristics very similar to those of West Cork, the absence of immigration has meant that this area has not change over the years its economy and society remaining identical to those present in the 1970s.

4. Conclusion

The blow-ins have launched a series of alternative initiatives that have brought benefits to the area. There was an increase in the variety of food offered that led to a diversification of the Irish diet. With their activities they showed the potential of the territory, making the local community also part of these realities. The link between AFNs and the blow-ins can be seen by the correspondence among the areas with a greater presence of productive activities and those with a higher proportion of foreign nationals. However, given that there has been no new wave of immigration and a continued migration of young people from rural areas, doubts must be raised about the possibility of a renewal of Blow-in communities and the future of AFNs. Decisive in this case will be the role of Irish producers who will have the opportunity to decide whether or not to keep these realities alive.

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TERRITORIAL COOPERATION FOR RURAL DEVELOPMENT: PLANNING TOOLS IN THE CURRENT EU PROGRAMMING PERIOD

by *Ivana Bassi*[*] and *Elisabetta Peccol*[**]

1. Introduction

This paper focuses on the main initiatives for rural development based on participatory planning in the Friuli Venezia Giulia (FVG) region in 2014-2020, and demonstrates how some participatory planning tools can be useful in designing local development strategies.

Co-operation between local actors is a crucial condition for effective definition and subsequent implementation of self-sustaining local development strategies, namely strategies aimed at promoting the rich array of territorial resources (Knickel et al., 2009; Palmisano et al., 2016). Indeed, the local development process is only possible through the definition within the territory itself of those rules, such as settlement, economic, political and social rules, able to produce a long-term stability between the natural and the cultural environment (Magnaghi, 2010; McAreavey, 2009).

Participatory planning is effective in creating synergies between scientific and experiential knowledge, in capturing the real needs of the territory, in increasing the chances of success of specific interventions, as well as in strengthening participants' empowerment (Bassi and Carestiato, 2013; Batini and Capecchi, 2005; Bobbio, 2007; Dougill et al., 2006, Giusti, 2001).

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 ISBN 9788891786883

2. Methodology

The research has been organized in two phases. In the first phase, a qualitative documentary survey has been carried out in order to identify the main programmes for rural development based on participatory planning during the current programming period in the FVG region.

In the second phase, by taking into account the state of implementation of these programmes, an empirical survey has been carried out using the Case Study methodology (Yin, 2005) in order to analyze a local initiative to apply for the sub-measure 16.7 of the PSR FVG 2014-2020.

3. Results

3.1. Programmes based on participatory planning

1) PSR FVG 2014-2020 - Measure 19: support to LEADER local development (EU Rural development policy)
   In FVG, there are 5 local action groups (LAGs):
   - Montagna Leader, active in 25 municipalities of the mountain area of the Pordenone province;
   - Euroleader, which operates in 28 municipalities of the Carnia sub-region (Province of Udine);
   - Open Leader, active in 15 municipalities of the Gemonese, Canal del Ferro and Val Canale areas (Province of Udine);
   - Torre Natisone, which includes 17 municipalities of the Torre and Natisone Valleys (Province of Udine);
   - Carso-Kras, in the 12 municipalities of the Karst territory of the Gorizia and Trieste provinces.

   Ongoing LAG development strategies have been approved in 2016.
2) PSR FVG 2014-2020 – Sub-measure 16.7: co-operation strategies for territorial development (EU Rural development policy)

This measure supports cooperation strategies for coordinated development initiatives in those municipalities included in rural areas of type B and C (respectively "rural areas with intensive and specialized agriculture" and "intermediate rural areas"), which are not affected by the LEADER approach. The sub-measure provides support for the preparation and implementation of cooperation strategies for territorial development carried out by public-private partnerships.

3) HEurOpen CLLD Strategy (EU Cohesion policy)

Open Leader and Euroleader LAGs (FVG) together with the LAG of Hermagor (Carinthia) participated in a call for proposals for cross-border CLLD strategies under the Interreg V Italy-Austria programme 2014-2020. The strategy of the three LAGs, called HEurOpen, has been approved in 2017.

4) FLAG FVG 2014-2020 (EU Common fisheries policy).

In FVG a coastal action group (CAG) was already established in 2007-2013. Accordingly to the current national programme, the CAG prepared the Action Plan for the establishment of the new FLAG, which has been approved in 2016.

3.2. The Case study

A direct survey has been carried out in order to analyze a local initiative to apply for the sub-measure 16.7 of the PSR FVG 2014-2020. The study area consists of ten municipalities located in the FVG plain, which are all included in the rural area of type B.

Stakeholders of these municipalities have been asked to define their development strategy, including territorial analysis and the resulting development paths. In order to deepen the territorial analysis, a participatory approach has been carried out by implementing a combination of two participatory techniques: the construction of scenarios through the implementation of a simplified SWOT analysis (weaknesses and strengths of the area) and focus groups (structured discussion technique).

Furthermore, statistical and cartographic analyses have been carried out on demographic and economic characteristics, with particular reference to the agricultural sector and on key structural elements of the territory, such as the local system of protected areas, landscape and cultural heritage, urban areas, road and slow mobility network, etc.

These analysis allowed the definition of the strategic development paths of the inter-municipal area, as illustrated in Table 1:

Tab. 1 – Strategic development paths

Path	Description
Rural slow mobility network (walking, bike, horse, boat, etc.)	· maintenance of tracks, small connections (e.g. bridges) · restoration of valuable elements along the tracks · definition of thematic routes (e.g. visits to farms, cultural trails, nature trails, religious itineraries, waterways) · billboards, maps, multimedia applications
Network of services - Network of businesses (farms and other companies)	· collective supply of local products to local restaurants · educational and social farms (collaboration with school and health institutions) · services for local communities (e.g. bread made with local organic wheat for school meals) · services for visitors / tourists (e.g. hire and repair of bikes)
Animation and training	· hospitality · new products, new services · business networks
Territorial marketing plan	· territorial brand · participatory planning · communication tools · cooperation between organizations (pro loco, cultural associations, etc.)

These results endorse the importance of local actors' involvement since the early stages in planning the process of local development, them being the main experts of their territory. The work done to highlight potentialities, criticalities and desirable development paths has allowed not only listing such factors, which is a prerequisite for designing local development strategies, but even before to develop a critical reflection on them and to improve local actors' empowerment. Moreover, the implementation of participatory tools has also been effective in reinforcing relations between local actors. This result is also important, since a robust relational system is an essential requirement for successful territorial development projects.

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TOWARD A NEW COOPERATIVE MODEL: THE COMMUNITY COOPERATION

by *Alba Distaso*[*]

1. Objectives

The focus of this paper is to verify that the community cooperatives (CC) have a role which goes beyond the production and exchange of goods and services. We are in front of CC when the following conditions happen: a) a generation of social externalities, such as the accumulation of social capital and the diffusion of networks based on trust at local level; b) a production of goods of common interest; c) an explicit definition of a social mission; d) a multi-stakeholder governance; e) a distributive function. The foundation is in their capacity to contribute to civilize market economy (Zamagni, 2008), which it explains oneself in its civil function, owing to the joined production of both goods/services for the benefit of the community and relational goods. It deals with goods characterized by the fact that the producer is at the same time consumer. This implies that cooperative solution allows to pay attention both to the demand and supply side.

2. Methodology

The nature of this study object binds the methodological choice. In order to reach to a circumstantial valuation on what the cooperative principles have effectively realized, the research has to be founded on a factual analysis. Therefore, it seems that the most appropriate methodological approach is the descriptive-interpretative one.

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 ISBN 9788891786883

In the first week of June 2017 we carried out a field research in two different realities which have been operating since a *quinquennium* of the province of Lecce: the cases of CC of Melpignano and Zollino. This research is based on the direct gathering of data and information owing to interviews, through a semi-structured questionnaire, with the presidents and some members of CC, as well as with the mayors of respected municipalities.

3. Results

The CC of Melpignano was born in 2011 on the initiative of the major of the municipality. Nowadays, the CC is autonomous from the municipality institution, having reached 250 stakeholders. It is considered a model of CC owing to the positive results, as it is demonstrated by net operating surplus which has been nearly 60.000 € on average in the period 2014-2016, equivalent to the 10% of gross revenues on average. Its main focus is to supply purified water of the Apulia Aqueduct to all the citizens through "water's houses" located in place and, gradually, in other 50 municipalities realized with an investment of nearly 20.000 € per each one.

The CC of Zollino is a cooperative of producers having the aim to increase the value of three local typical products: two species of legumes, the broad bean and the dwarf pea; a finished product, in place called *scèblasti*, a kind of greek soft bread. Its constitution has been the reply to the need to safeguard more an identity then an economic heritage. The stakeholders are 120. In the period 2014-2016 the economic results are not always positives. Noteworthy is the heterogeneity, for the different capacities, interests, attitudes of the involved actors both among producers, workers and other members.

These structural data may help to understand the conditions of context which have favoured the institution of such new form of cooperation. As for Melpignano community, the choice to invest in a common good as the distribution of water, has allowed to continue a project, concerning photovoltaic plants to install on the community's houses. The decision to undertake in a more ambitious and continuative project as that of the water's houses has been possible for the favourable social and cultural conditions which already existed allowed to undertake in the institution of the CC, although not all citizens did not have the exact awareness of this new form of cooperation. The CC is considered a form of active citizenship which has been already operating in the community. The strength of this CC lies in the strategic choice to practice low prices (5 cents of € per every litre of water). The net incomes on sale of water are completely allocated for the community

requirements, as supplying books for the sons poor families or other initiatives for the community benefits. Besides, an indirect effect of such a policy concerns social benefits in terms of environmental impact, owing to the saving of plastic bottles. Nowadays, in order to diversify the activity, the CC is engaged itself in the building of a playing park. This demonstrate that the CC follows a policy aimed at obtaining an equilibrium able to involve both internal (workers, investors, members) and external (users, suppliers, territory) stakakeholders.

Melpignano's community gives a positive assessment on the cooperative governance. This means that all decisions are shared. We cannot neglect that the CC engages itself in a constant effort to make effective the principles of cooperation. We are in presence of a real democratic firm because there are unity of intentions and there are not cases of exit from it due to the relative absence of strong contrasts of interests.

Differently from the previous case, the CC of Zollino has a lower consent because it is considered a niche, even though the management is active through various initiatives involving community. Noteworthy is an initiative which tries to extend its action through the issue of community vouchers. They offer the reciprocal advantage both for the citizens to obtain discounts on purchases of goods in the shops the that have an arrangement with the CC and for the sellers to sell more. Other initiatives are: *i*) information actions aimed at the improvement of the quality of the food; *ii*) the choice to disinfest through a system of microwave beam, without use of chemical products; *iii*) management of cemetery and sticking up posters services allowed by municipality; *iv*) supplying of legumes rich food for events. Holding a public meeting in order to fix the price of the legumes that the producers have to follow, was an important action remarking the democratic character of the CC. Nevertheless, it presents some critical aspects, above all for the fact that not always the belonging community is a strategic interlocutor; and yet the choices and activities carried out are coherent not only with the principles of the CC but they are such to product positive effects over the long run.

Beyond the differences among the two cases, we may affirm that for both CC the principles, more than the rules, constitute the source from which individual and collective behaviours derive.

We may draw the conclusion that the commitment of local policy should be the founding of the conscious communities. On the other hand, communities with high level of social awareness contribute to outline policies more careful to the needs of population. For this reason, the expression of Stephen Smith (2001), "blooming together or wilting alone", is appropriate to under-

stand that community cooperation is a possible reply to changes which are carried out.

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FEASIBILITY OF A MUTUAL FUND TO STABILISE THE INCOME OF FARMS BELONGING TO A DAIRY COOPERATIVE

by *Eleonora Chinchio*[*] and *Samuele Trestini*[**]

1. Introduction

During the last years, political, economic and environmental factors have caused exceptional price volatility in agricultural commodities and products, putting at serious risk market stability. In particular, the recent shift of the EU Common Agricultural Policy (CAP) from the maintenance of high and stable prices to greater market orientation (Bergmann, O'Connor and Thümmel, 2016), seriously affected the dairy sector, reducing farmers' ability to invest in future production and exposing them to an increased risk of failure (Meuwissen et al., 2013).

In order to address this issue, the Reg. (UE) 1305/2013 posed risk management tools in the second pillar of the CAP and introduced a new instrument, the Income Stabilisation Tool (IST). The IST is a mutual fund compensating farmers affected by a serious drop of income (higher than 30%) compared to a reference income given by the average annual income in the preceding three-year or five-year period.

Despite this being a promising tool, as it allows reducing typical insurance issues like moral hazard and adverse selection, it remains still little applied, such as mutual funds in general.

The major current limit of the IST is that it requires the precise measurements of farm incomes and costs, the absence of guidelines to define the reference income, membership costs and trigger levels (Finco et al., 2013; MIPAAF, 2015) and the difficulty of mutual funds to attract a sufficient number of participating farmers (EU, 2016).

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 ISBN 9788891786883

Therefore, to minimize these problems, the European Commission proposed to reduce the threshold of the loss of income to access to the fund resources from 30% to 20%, through the so-called Omnibus Regulation (EU, 2016). Moreover, to simplify farmers' access to this instrument, a draft opinion of the Committee on Agriculture and Rural Development, proposed in the early 2017 the use of indexes to estimate the annual loss of income.

During the last years, different studies were made to evaluate the IST potentiality (Dell'Aquila and Cimino, 2012; El Benni and Finger, 2013; Finco et al., 2013; Capitanio, Adinolfi and Di Pasquale, 2016; Trestini, Giampietri and Boatto, 2017; Trestini, Pomarici and Giampietri, 2017), with rare applications to dairy farms (Trestini et al., 2018).

To our knowledge, there are no studies applying this tool to a real case study in the Italian context. Consequently, the aim of this work is to evaluate the feasibility of a mutual fund to stabilize the income of dairy farmers belonging to a dairy cooperative, providing a case study useful to further test and improve the efficiency of the Income Stabilisation Tool.

2. Materials and methods

We selected a sample of 109 farms productive during the nine-year period 2008-2016 and extracted information from the cooperative database about the number of farmed cows, the quantity of milk supplied to the cooperative and the relative annual farmers' compensations.

In line with the US Dairy Margin Protection Program (Bozic et al., 2012), we adopted the Income Over Feed Costs (IOFC) as index of the farmers' income and estimated the reference income by which to evaluate the income variation for the years 2011-2016 as the average of the previous three years. According with Trestini et al. (2018), the reference incomes were standardised for the number of cows, in order to adjust observed income variation for changing in the herd size. The feed costs were estimated using data about dairy farms, from Veneto Region, provided by the national FADN for the period 2008-2015, and in their attribution to the cooperative farms we took in account for the different feed costs sustained by farms of different level of productivity. As feed costs of 2016 were not reported in the FADN database, we indexed them based on Bologna commodity exchange, assuming a standard ration composed by the 22% of corn for grain, the 41% of corn silage, the 13% of soybean meal and the 24% of alfalfa hay, consistent with Bozic et al. (2012).

Lastly, from the comparison of each farm income in the period 2011-2016 with the relative reference value, we identified the farmers with a loss of income above 20%, i.e. those who, according to the recent Omnibus Reg., would have been indemnified.

3. Results

Considering the entity of the indemnifications as the average annual requirement of the fund, we are able to suggest a hypothetical annual fee that the farmer should pay to participate to the fund. In the considered case study the fee, expressed as a percentage of the reference IOFC, accounts for 8.3%, without public contribution from the CAP. Beside this analysis, to setup such a mutual fund, it is crucial to be aware that the capacity to indemnify its member depends on the available capital stock in the fund. In the observed case study we can state that the period from 2011 to 2014 has been enough to build a capital stock able to guarantee all the indemnification to farmers in the crisis period of 2015-2016.

These results will allow the cooperative to evaluate the adoption of this type of instrument to help their members facing the years of crisis, either with the benefit of public subsidies or privately. Moreover, at a more general level, this case study will provide useful insights in the IST application, in particular about the use of indexes for estimating the farmers' income and the feed costs, which is critical to simplify the use of the IST and thus promote its adoption.

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TOURISM CARRYING CAPACITY (TCC) AS A BASIC MODEL IN GOVERNANCE OF INLAND AND COASTAL AREAS

by *Graziella Benedetto*[*] and *Donatella Carboni*[**]

1. Introduction

The emphasis in this study is on the interaction between tourism and environmental systems studied.

A tourism flow planning policy must necessarily address the problem of sustainable quantitative limits. The problem therefore lies in identifying an indicator capable of measuring a threshold value over which a breaking point is detected in the system.

According to the World Tourism Organization (WTO, 1981; OMT, 1992), the Tourism Carrying Capacity is: «*The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic, socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction*» (UNEP/MAP/PAP, 1997).

The aim of the work is to focus attention on the use of TCC as a basic tool in the choice of appropriate sustainable management policies.

For this purpose, first attention is drawn to the evaluation models of TCC used; then a case study is presented to show how TCC works and how we can use the number obtained in order to redefining the management policies of the sites concerned.

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 ISBN 9788891786883

2. Methodology

Certainly widely used in literature (Benedetto et al. 2015) is the Cifuentes model (1992; 1999) especially in protected areas, parks, beaches, caves and paths (*e.g.* Amador et al., 1996; Cifuentes et al., 1999; Pereira da Silva, 2002; Sayan e Ortaçesme 2006; Nghi et al., 2007; Sayan e Atkim, 2011; Zacarias et al., 2011; Garcia et al., 2011; Lobo et al., 2013; Rajan et al., 2013).

According to Cifuentes (1992; 1999), the determination of the TCC must be consistent with the objectives of the protected area itself: these are the objectives of addressing management choices and highlighting any limitations that may have to be put in place in order to pursue certain results.

3. Results

Here we present the application of the Cifuentes method to a beach in Asinara National Park (North West Sardinia) which is part of a study commissioned by the Park Authority and funded by the Ministry of the Environment, whose results will be published soon[1].

i) the Physical Carrying Capacity

The area of Cala Giordano is only 180 m^2. The PCC, calculated considering three different values of the area required per tourist (4, 6 and 8 m^2) and two rotation factor (4 and 3), ranges from 67 to 180 tourists by day (8.235 to 21.960 tourists during the four months period).

ii) The Real Carrying Capacity

Five correction factors have been used to calculate the RCC (Table 1). The two first factors have been calculated considering the number of rainy or windy days. The first factor, Cf_1corresponds to the rainfall. The mean number raining days at Asinara island during the summer period (June to September corresponding to 122 days) is 8 days, and consequently Cf_1 is equal to 0,9344. For the second correction factor (wind), the mean number of windy days during the four months period is 19, and corresponds to a Cf_2 of 0,8443.

[1] Corbau C., Benedetto G., Congiatu P., Simeoni U., Carboni D. (*in press*). *Tourism analysis at Asinara Island (Italy): Carrying capacity and web evaluations*.

Tab. 1 – Corrective factors

Cf_1	Cf_2	Cf_3	Cf_4	Cf_5	Cf_{tot}
Rain	Wind	Perturbation flora fauna	Anthropic waste	Animal ejections and jellyfish	
0,93	0,84	0,95	0,95	0,98	0,6977

The Real Carrying Capacity, obtained by multiplying the PCC by the total corrective factor, varies from 47 tourists per day (5.746 per season) to 126 (15.322 per season).

The ECC represents the maximum sustainable number of tourist considering the management capacity related to the staff, the infrastructure and the equipment (Table 2).

Table 3 reports the results of the calculation of the ECC.

Tab. 2 – Matrix for the calculation of the correction factor Mc

	Lifeguard	+
Management Capacity – staff	Tourists guide (surveillance, remains on the site	+
	1 grouping zone* / beach	+
	signage**	-
	services (chemical toilet, shower, light,)	-
Management Capacity – infrastructure	walkways for access to the beach ***	-
	Surveillance equipment, video-camera, emergency support/	
Management Capacity – Equipment	Communication system (telephon and walkie talkie)	-
Management Capacity index		**0,43**

**= Shaded structure for lifeguard, first aid kit*
***= with bathing rules and useful emergency numbers*
****= wooden walkways to protect the endemic flora from trampling*

Tab. 3 – Effective Carrying Capacity of Cala Giordano

A (m^2)	Au (m^2)	Rf	RCC per day	RCC per season	Mc	ECC per day	ECC per season
180	8	3	47	5.746		20	2.471
		4	63	7.661		27	3.294
	6	3	63	7.661		27	3.294
		4	84	10.215		36	4.392
	4	3	94	11.492		41	4.942
		4	126	15.322		54	6.589

The assessment of the TCC for the Cala Giordano beach showed that the tourism activity is in lower level with its carrying capacity. This type of carrying capacity assessment can be used as an input into the regular planning process.

Already on another occasion it has been pointed out that this area needs a robust sustainable tourism planning in a framework of public/private often diverging goals (Benedetto et al., 2016).

The result becomes the fulcrum for the future Park Government policy driven by the ability to ensure a sustainable use of the resource. To this end, it is necessary to build a territorial governance policy based on a collaborative principle, between public authorities on the one hand and between public authorities and private entrepreneurs, and still among private entrepreneurs.

From cooperation will descend a shared strategic planning which can manage both conservation and the tourist use of natural resources. So the accessibility for tourists, and even businesses and researchers is to be considered a real priority, as well as decision about designing a model of sustainable use capable of integrating tourism with the long term conservation of natural resources.

The use of such an approach can also be replicated in other sites of environmental and natural interest.

Though these are first results, these can already be considered a useful reference for further researches and guidelines for local institutions.

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HOW ADAPTIVE GOVERNANCE CAN GENERATE EFFECTIVE LOCAL ADAPTATION PLANS

by *Barbara Pancino*[*], *Emanuele Blasi*[**], *Angelo Martella*[**] and *Nicolò Passeri*[***]

1. Background and objectives

The European Union, in the Lisbon Treaty adopted in 2009, enshrines territorial cohesion as a primary objective and recognizes the highly diversified nature of the territories that make it up. To promote a more balanced development and a greater solidarity between territories through the pursuit of fluidity between the different territorial levels within forms of multi-level and non-hierarchical governance is the main objective of territorial cohesion, as well as the facilitation of coordination between territorial and sectorial policies in order to generate integrated approaches and cooperation between areas. Based on the history and the evolution of socio-economic areas that need to cooperate in order to achieve common goals, different forms of governance are generated. The concept of adaptive governance is based precisely on the interactions at different scales and promotes communication between organizational levels (Adger et al., 2011).

The adaptive governance, is a particular form of government that empathizes the ability to adapt to the changing relationships between society and ecosystems, maintaining ecosystem services, and it appears an effective system to deal with a complex challenge such as adaptation to climate changes (Dietz et al., 2003; Folke et al., 2005). Indeed, adaptive governance features are experimental: new policies for ecosystem management, new approaches to cooperation and relations between stakeholders, new ways to promote flexibility, and new institutional and organizational arrangements. Governance is

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 ISBN 9788891786883

defined adaptive when it focuses on the behaviour of the individuals, their actions and the results that are produced as well. Adaptive governance systems can enhance the overall resilience by encouraging flexibility, inclusion, diversity and innovation (Resilience Allience, 2010; UN-HABITAT, 2015).

The main objective of this study is to analyse how a system of adaptive governance is able to manage climate change perception and adaptation policies in a complex area, which requires plan of actions and solutions for community problems. For this purpose, it was analysed the participative process to be carried out for the definition of a Local Adaptation Plan.

The Local Adaptation Plan is a tool defined locally, that individuates the priorities, promotes actions and provides solutions for Climate Change Challenges into certain area, starting from the evidences collected. This can be developed taking into account social and ecological systems peculiarities, as well as community risk perception.

For this purpose, the study has chosen, as case study, a rural mountain area of the Italian Alps, which has its own local governance system: Community of Valle Valsugana and Tesino (Comunità di Valle Valsugana e Tesino).

2. Methodology and results

The risks deriving from the climate change, trough a stakeholder participative process, have been identified and clear actions and strategies, that can help promoting climate change adaptation, have been defined. The participative process was carried out in two steps. The first phase regards the stakeholder engagement trough an on-line questionnaire, which produced 37 respondents interested in actively participating to a focus group. Two parallel focus groups have been then carried out.

Although the number of respondents does not allow to carry out a proper statistical analysis, the qualitative analysis has been used above all to frame the context in which the focus groups have been displayed, as well as to initiate the phase of identifying and inviting different social groups to the process of coding the Local Adaptation Plan. Indeed, plans developed in partnerships with communities are more likely to be implemented (Wiseman et al., 2010).

These issues, highlighted into the questionnaires, have been discussed into stakeholder participative process during the meeting driven by the facilitators.

After a definition of climatic risks perceived, the participants divided into groups, showed their own perception and intervention sector in terms of climate change.

Then a scientific team showed to the groups the climate data collected into the area. The facilitator lead the debate into the group, allowing to redefine the priority order of the identified thematic areas and the selection of the three most relevant ones after the presentation. The scale of priorities proposed by the group is the following:

- Natural risks. Drought hydrogeological upstream, landslide events, likely alluvial phenomena, depopulation, extreme atmospheric phenomena.
- Agriculture and forest. Change in plant protection management, new molds and allocated insects, increasing temperatures and extreme atmospheric events, water shortage.
- Health. Risks linked to rising temperatures and exposure to sunlight in the hottest months of the year.

3. Conclusions

The methodology proposed brought to clear results about the local issues and the priorities to be faced in terms of impacts of climate change on the territory.

The definition of a proper Local Adaptation Plan, instead, seems a harder task, since a long term vision of how the community will adapt to climate impacts, including the statement of quantifiable objectives and resource targets in regard to conserving resources under altered climates is needed.

The policy context in which local territorial bodies operate plays a key role in shaping local adaptation solutions.

Indeed, a local government's policy framework includes policies that even if not directly related to climate change has the potential to develop high quality adaptation responses (Allman et al., 2004; Urwin and Jordan, 2008).

Our research highlights a clear need to establish standards of local plan quality, recognising that top-down policies are unlikely to be effective. Effective adaptive policies should require strategic allocation of resources that acknowledge local context, and yet, such policies will be politically difficult to be implemented. Results challenge the effectiveness of devolving climate adaptation planning to local governments without addressing structural, procedural, and contextual barriers.

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IMPROVING FOOD SUPPLY CHAIN SUSTAINABILITY THROUGH DECREASING ITS GREENHOUSE GAS EMISSIONS: A PILOT-STUDY

by *Maurizio Droli*[*]

1. Introduction and objectives

Greenhouse gas (GHG) emissions by agriculture, industrial processes and waste sectors have decreased since 1990 following the indication of EU commitments but Land Use, Land Use-Change and Forestry (included in the LULUCF program) have remained a net sink, having absorbed more carbon dioxide (CO_2) from the atmosphere than they emitted. This study tries to evolve a previous one observing consistency of choices about the policy options facing the EU governance for the inclusion of Agriculture, Forestry and other Land Use (AFOLU) into the 2030 greenhouse gas mitigation framework (Chang et al., 2016).

The three principal options for future EU environmental policy design are the following: Option 1 — the LULUCF pillar consist of maintaining the non-CO_2 agriculture sector emissions in a potential future Effort Sharing Decision, and further develop a LULUCF sector policy approach separately. Option 2 — Land use sector pillar states the merging the LULUCF and agriculture sector non- CO_2 emissions into one new and independent pillar of the EU's climate policy. Option 3 — Effort Sharing provides for the inclusion of the LULUCF sector in a potential future Effort Sharing Decision.

This study target is twofold: a) stress-testing the Rasch model; and (b) to quantify the potential awareness degree about these policy options.

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 ISBN 9788891786883

2. Methods

GHG can be reduced by activating Public Private Partnership (PPP) processes within the European Union environmental policy framework (World Bank Group, 2016). A PPP can be described as a cooperative agreement established between two or more public and private formally independent organizations usually aimed to achieve long-term targets (Hodge & Greeve, 2016). Different methodological paths can be followed to achieve environmental policy targets through establishing a PPP. This study adopts the multi-theory-based methodological path suggested to increase PPP productivity in globalized and complex industries, such as tourism (Droli, 2007) following which potential partners' awareness on strategic options represents a key-prerequisite for the setting-up of successful PPPs.

A consultation survey launched in 2015 by the European Commission provided the needed database. That survey has been carried out in parallel with the "consultation on the preparation of a legislative proposal on the effort of the Member States to reduce their GHG emissions to meet the UE's GHG reduction commitment in a 2030 perspective. That deriving database has been analyzed by applying the Resource Based Theory (RBT) and its spillover named Knowledge Based View (Grant, 1996) postulating that only "above the average" (valuable) resources and / or performances, can generate a sustainable competitive advantage (Barney, 1991).

Following the RBT approach, valuability thresholds potentials have been exploited wherever possible in order to locate 'valuable' environmental awareness among respondents. Other theoretically relevant resource key-quality attributes such as performance 'rarity' (concentration), 'inimitability' (social complexity) and 'non substitutability' will be considered by further studies.

The above mentioned Consultation survey was addressed to independent subjects including: i) Associations; ii) Governments; iii) Research institutions; iv) NGOs; and v) Citizens. Those subjects were asked to answer nr 9 questions supposed to be acknowledged (aware) about main distinctions existing among EU environmental policy options. This study focuses on the key-questions Nr. 8 and Nr. 9 which are respectively worded as follows: "What could be the main advantages and disadvantages of the three policy options outlined above, and which option(s) should be further developed or modified?" and "Please choose the preferred option and explain rationale for that choice". Their environmental awareness were quantified by adopting a well assessed analytical tool.

Different models can be adopted to achieve this study purposes (Piccinini et al., 2017, 2016). The essential performance enlightened by the Rasch model, which has been choosen, is the respondent's "ability to give an answer" assumed as the proxy of the knowledge (awareness) of the subject. The application of the following Partial Credit type of Rasch model (Masters, 1982) allowed us to analyze that performance. Responses given to each question were rated from 0 to m_i depending on the person's ability to express an opinion or judgment on the topics discussed. Finally, that model was estimated through WINSTEPS software application.

3. Results

A 'Rasch model stress-test' was developed by excluding some items that didn't fit fully the pattern and its degree of statistical reliability was assessed. Person reliability = 0.80, Item reliability = 0.98, and Infit and Outfit are also lower than 1.1 and 1.15, respectively. None of the adopted reliability indices (Person, Item reliabilities, Infit and Outfit) indexes significantly differ from 1, thus demonstrating the reliability of that model even in a statistically stressful environment.

Interactions between farmers and landscape have been largely explored (Iseppi et al., 2015). Similarly, interactions existing between environmental policy targets and EU citizens have been often taken for granted. To verify this assumption, the respondents' choices among the options of the question 9 and the *environmental awareness* derived from the Demand 8 have been explored. Research organizations achieve the highest environmental awareness level and one of the lowest relative variance. Nevertheless, despite this achievement, they do not arrived at a precise and unambiguous choice. At the opposite, Governments seem to achieve the lowest environmental awareness level while with a mid-range relative variance. Heterogeneity of the levels of respondents' environmental awareness is high despite the abundant item-specific information given by the questionnaire. The productivity of EU Environmental policy continues to show wide improvement margins (EEA, 2016). The Rasch model, despite some limitations, gives statistically reliable information despite statistics stressful environments and provides indications valuable to set-up further investigations aimed to set-up an even more rationale and socially involving EU environmental policy. As it can be argued, there is no difficult question for people who know the answer. Subjects interviewed by the 2015 Consultation survey generally seem not aware enough

on environmental policy targets to be involved in the development of a EU environmental policy aimed to achieve them. Consistently, this study calls for further research.

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CONSUMER STATED PREFERENCES FOR ENVIRONMENTAL LABELS: TWO CASE STUDIES IN THE DAIRY SECTOR

by *Maurizio Canavari*[*], *Silvia Coderoni*[**], *Loris Giuliodori*[***] and *Elena Visi*[****]

1. Introduction and objectives of the work

Climate change mitigation is one of the key environmental goals of agricultural production worldwide. According to many studies in this field (among others: Coderoni and Pontrandolfi 2016), supply side options, i.e. options that tackle production aspects of GHG mitigation, are not sufficient to reach the ambitious mitigation targets set by European (European Commission 2011 and 2012) and international climate policy agenda. Demand side options, which consist of more sustainable consumption patterns, are thus fundamental to curb agricultural GHG emissions (Coderoni et al., 2015).

The most common instrument to support changes in consumption patterns are the so-called "sustainable labels", i.e. types of labels that are designed to convey to the consumer concepts related to environmental, ethical and social sustainability (Padel et al. 2010; Vermeir and Verbeke 2006; Zander and Hamm 2010). Sustainable labels can, among other objectives, help orienting the consumer towards buying GHG-saving agricultural products and thus, mitigating agriculture's contribution to global warming. To this extent, they are referred to as "carbon footprint" (CF) labels, as they indicate the grams of carbon dioxide equivalent (CO_2e) emitted into the atmosphere along all the life cycle of a product or service, which comprises material extraction, production, transport, transformation, distribution, use and disposal of products (Kohnle 2013).

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While many studies have explored the production side of climate change mitigation for Italian agriculture, both at micro and macro level (among others: Rete Rurale Nazionale 2012; Coderoni et al. 2015; Coderoni and Esposti 2014; Baldoni et al. 2017), the demand side has been less explored, despite its relevant role in helping tackling climate change.

Studies on this area are aimed at analysing consumers' preferences for purchasing products with a lower CF label or their willingness to pay (WTP) for these products. A literature review carried out to examine the works that so far have analysed consumer preferences and WTP for CF label confirms that the topic is not yet widely explored, especially for Italian case studies (for a review of this literature see Canavari and Coderoni 2018; Canavari and Bazzani 2016). For the Italian market, this topic was investigated only by Caputo et al. (2012 and 2013), Vecchio (2013), Vecchio and Annunziata (2015) and Lombardi et al. (2017).

2. Two case studies in the dairy sector

The two case studies conducted focussed on consumer habits when purchasing dairy foodstuffs and assessed their understanding and preference for low-carbon products. The main objectives were to estimate their WTP for the purchase of one litre of fresh milk with a lower CF label respect to a conventional one.

The questionnaires refer specifically to dairy products, namely milk, as livestock products have been in the centre of the debate at international level (Gerber et al. 2013), for their higher GHG emission compared to vegetables (Goodland and Anhang 2009).

The two studies were conducted among Italian consumers from December 2016 to February 2017. In both cases we used an online questionnaire, gathering information on consumption choices and socio-economic characteristics for a total of 393 consumers interviewed. Summary statistics on the surveyed sample are provided in Table 1.1. The questionnaires were similar but not identical, and they were composed of four sections: consumer habits, environmental awareness, environmental and CF labels, and personal socio-demographic information.

The use of web instruments to send the questionnaire to the interviewees, though has facilitated the reaching a high number of respondent, allowed us to collect samples that cannot be considered representative of Italian consumers (Canavari et al. 2005); nevertheless, they allow obtaining quite interesting primarily descriptive information.

Tab. 1 – Summary descriptive statistics of the two samples

	Case study A	Case study B
Respondents (count)	215	178
Male (%)	56	27
Age brackets (%)	18-24: 11	20-29: 40
	25-34: 28	30-39: 17
	35-44: 24	40-49: 10
	45-54: 20	50-59: 26
	55-64: 15	60-69: 6
	>65: 3	70-79: 2
Education (% High school or higher)	94	

In the two case studies WTP analysis was conducted with a different approach. In case study A, the survey was based on the contingent evaluation method that relies upon asking consumers to directly state their WTP for the product considered. An average +9.19% premium price for lower CF milk has emerged, with maximum values of 50% (Assuming an average price of 2€, the premium price was on average 0.19€). The analysis also shows that disposable income of the respondent is considered an important driver in inspiring and increasing his WTP for CF label.

In case study B, in order to estimate the WTP, a hypothetical purchase situation has been proposed by comparing product 1 (milk bottle with CO_2e emissions of 200gr) at the price of 1.30€ with a product 2 (bottle of milk with CO_2e emissions equal to 150 gr) in which each time the consumer was asked to respond according to a price variation (of 0.10€) of product 2 (with a maximum value of 2.00€). The average WTP was more than 30%. The consumer is likely to pay € 1.68 per bottle of low-CF milk and therefore, compared to the high-impact product proposed at the price of € 1.30, the surplus difference is € 0.38.

4. Some concluding remarks

The two explorative case studies presented focussed on consumer habits when purchasing dairy products (namely, milk) and assessed their understanding and preference for low-carbon products.

Results, though preliminary, primarily descriptive and based on stated preferences, suggest that an interest of consumers in environmental labels exists: respondents have declared to be willing to pay a positive premium price for lower CF, ranging from 0.19 to 0.38€ on average.

However, scarce information on such tools, makes their application difficult. More in-depth and statistically sound analysis will be needed to obtain more reliable estimates of WTP for CF labels. Future research should, for example, focus on experimental economics techniques, such as experimental auctions (Lusk and Shogren 2007).

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AGRI-FOOD COOPERATIVES IN A MESO-INSTITUTIONAL PERSPECTIVE: CONCEPTUAL FRAMEWORK AND EMPIRIRCAL ANALYSIS OF THE ITALIAN CASE

by *Daniela Toccaceli*[*], *Konstantinos Karantininis*[**], *Gaetano Martino*[***] and *Alessandro Pacciani*[****]

1. Introduction

A huge diversity of organizational solutions characterizes the Agribusiness value chains resulting in a complex and very rich landscape organization (Ménard, 2016, 2017; Grandori, 2017; Ménard and Klein, 2004). Transaction Cost Economics predicts that the allocation of both property rights and decisions rights determine variety (Ménard, 2013, pp. 1095 ff). Cooperative firms are part of this variety of Agrifood governance forms (Chaddad, 2012; Ménard, 2007).

The paper aims at contributing to the study of the relationships between the choice about the form of governance and the institutional context where cooperative firms operate. On the one hand, organizational arrangement can be classified in terms of intensity/centralization of control commanded by the specificity of assets and in terms of the related cost of governance that accompany the allocation of the decision rights. On the other hand, a given form is chosen by the agents according to the intensity of the transaction attributes. In addition, in the institutional context we can distinguish three layers (Ménard 2017). At the micro-level are the governance structures and at the macro level are institutions that provide the general rules of the game. *Meso-institutions* (M-I) populate the intermediate institutional level. M-I are devices embedded in and legitimized by the inclusive societal institutions and are in charge of actually implementing the general rules of the game by translating them into rules specific to sectors and/or geographic areas. Their importance is because

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 ISBN 9788891786883

they frame the players' domain of activities. Organizational arrangements define their governance (internal rules, codes, conventions) remaining submitted to the specific rules set by meso-institutions and grounded in the general rules (Ménard, 2014, p. 579). Meso-institutions vary because they deal with property and decision rights (Ménard, 2017, p.3). Property rights "require specific devices for delineating, implementing and controlling acceptable usage of these rights. On the other hand, the central exercise of these functions obey to various modalities, characterized by mechanisms through which decision rights operates. Public bureaus allocate decision rights through directives as opposed to market operating through auction are illustrative of this combination of devices and mechanism that makes meso-institutions a diversified set of arrangements" (Ménard, 2017, p. 3).

Namely we are focusing on the relation between the governance structures and the meso-institutional level (Ménard, 2014; Ménard, 2017) and aim to both identify the meso-institutional level influencing the Agri-food cooperative firms in Italy and propose an operational specification of the set of rules on which the identified meso-institutional bodies intervene.

2. Material and methods

The approach of our study is based on the literature interpretation and on the tentative identification of a net of concepts which may contribute to provide a more comprehensive analysis of cooperative firm in agri-business. We concentrate on the institutional and organizational analysis searching to make evident the necessity of adopting a perspective integrating multiple institutional layers. The conceptual framework is the used to propose a preliminary analysis of a typical case study.

3. Results

Several kind of rules and regulations affect the way Italian Agri-food cooperatives organize their transactions, even though most are not so specific. We identify the main organizational bodies having a meso-institutional nature in the Italian Agri-food cooperative sector carrying out a typical case study (Seawright, Gerring, 2008; Yin, 2004) focused on the *Lega-Coop,* which is an Italian organization – one among three Central of coops – integrating thousands cooperative firms and active in many field concerned with the regulation and the framing of the activities of those cooperative. By

through interviews with responsible managers and documents analysis we tried to focus on when *Lega-coop* serves as M-I body for Agrifood cooperatives. The case study focuses on the M-I specifically devised for coops and especially the four where Legacoop plays a role. From Ménard (2017b) we draw the two dimensions on which M-I are grounded in economic theory: the devices to monitor property rights and the mechanisms to allocate decision rights. Again following Ménard (2017b) they are evaluated respect to the degree of institutional decentralization, having regard for both the devices designed to allocate property rights and the mechanisms enforced to monitor decision rights. In this analysis, the mutualistic principle – that together with the democratic one is the very core of the social nature of cooperatives – rests at the core of all the other field of activities.

The more centralised is the Bureau to supervise coops. Italian law promotes cooperation and, according to the law in force, delegates to a Bureau of the Ministry for the economic development to verify that each coops stay with the mutualistic principles that grounds this special form of organization. The function is acted by a command-and-control mechanism, as the Bureau establish the rules to apply directly or by charging Legacoop – as well as each other Central organisation of cooperatives – to supervise the coops associated.

As the State estimates the social function of the cooperation, as the M-I is much centralised and able to affect the very existence of the coop.

Delegation to Bankitalia to regulate social loans from members to coops is less centralised as the rights are allocated by delegation and the cost to use the M-I seems to be (not yet existing empirical studies) the lowest. The social loans is the tool to overcome the issues in provision of capital of risk. The Italian Central Bank has been delegated to regulate the saving raising when acted by non-bank subjects. In this case, Legacoop has voluntary chosen to establish a more stringent regulation – cogent for its associated coops – in order to ensure major guarantees. This M-I affects the financial transactions the coops have to organise and their decisions about investments.

The devolution to Legacoop of the Mutualistic Fund administration is because, according to the social function of the cooperation and the law on the coops, coops can devolve the 3% part of their profits to contribute at forming a Fund devoted to develop the cooperative system in Italy. Legacoop acts as M-I body because is in charge of regulating how to raise funds per year and how to use them. The degree of decentralisation is higher than in the other observed M-I. Legacoop, being the sole shareholder, has constituted the Company "Coopfond" to which is given the property right on the fund and the role to implement the decision rights about how using it. The M-I impacts

significantly on the fiscal and financial transactions of the coops in any sector, especially on the concrete possibility to invest.

The national contracts of labour for Agri-food coops is the less centralised of the four. Relying on the general rules on labour, Legacoop Agroalimentare and the Syndicates of the workers are the M-I at stake. At national level are established the contract-types. Further specification are contemplated at regional or more specific level, before to come to the single coop level. Both the M-I bodies, in that representatives of the counterparties, act likewise agents in the market of labour. The affected transactions are those referred to labour force and related costs, so they may influence the choice about using technologies that are more or less labour saving.

The study of meso-institutions in the cooperative sector is needed because the cooperative firm is established on characteristic basis. It aims at implementing attributes based on mutualistic principles which are a direct outcome of the market process. As this process is aimed at providing the efficient allocation of the economic resources by through the prices as basic coordinating devices (von Hayek, 1945), it is necessary to set up rules able to guarantee the members and the society to established an economic initiative in which the economic freedom is connected to the economic democracy and the mutualism. The cooperative firm calls for specific rules which are not produced by market. Ménard (2007) and Chaddad (2007) showed how these rules are set up by the cooperative in itself as hybrid arrangements. However, many rules are set as at institutional environment that concern with the very nature of the cooperative firm. The case study shows how a specific M-I level channel the governance choice in Agrifood cooperative sector and how it mainly concentrates on the transactions concerning the resources gathering. Therefore the meso-institution layer in the case of cooperative is concerned with the general goal to specify rules which make the mutuality and the market process complementary.

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COOPERATIVE AS TRANSACTION COSTS MINIMIZING STRUCTURES: AN EMPIRICAL APPLICATION TO THE TREVISO PROSECCO WINERIES

by *Vasco Boatto*[*], *Luigino Barisan*[*], *Luigi Galletto*[*] and *Laura Onofri*[**]

1. Introduction

Cooperation in the wine production took shape in the area between Conegliano and Valdobbiadene with the creation of the Cantine Sociali di Conegliano (1932), Valdobbiadene (1952), Colli del Soligo (1957) and Vittorio Veneto (1959). The Cantine Sociali eventually played a key role in remunerating the activity of a wide range of partner winemakers and in supporting their income through the marketing of Prosecco wine. Nowadays, Prosecco cooperatives are successful socio-economic realities with very good performance indicators (see Onofri et al, 2016). In order to investigate the mechanisms that drive such positive performance, we use a transaction costs economics (TCE) framework, where cooperatives are interpreted as (mostly renewables and renegotiable) multilateral long-term contracts, which prescribes a set of incentivizing and dis-incentivizing rules. Although a complete literature review goes beyond the scope of this note, in the context of agricultural economics, applying TCE to cooperative firms is a well-known approach that includes the work of Cook (1995), Allen and Lue (1993), Feng *et al.* (2012), Hendrikse and Veerman. (2001), Rehber (2004), just to quote a few. The authors take a property rights perspective to explain the cooperative structures. In such perspective, the paper follows the stream of empirical TCE and aims at deepening the study on the relationship between contractual provisions and governance structure.

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 ISBN 9788891786883

2. Material and Methods

2.1. Data

The dataset merges two pieces of information: (1) institutional rules, gathered through the scrutiny of the Treviso cooperative wineries' statutes and regulations and (2) information on the wineries economic performance (see Onofri, et al, 2016). Table 1 shows the summary statistics for selected variables.

Tab. 1 – Summary Statistics

Variables	Mean	St. Dev.	Minimum	Maximum
Total Quantity (quintals)	158.8	110.4	10.04	409.02
Liquidation Price per quintal (Euros)	84.3	15.6	70	128
% of Prosecco Grapes over the total conferred grapes	43.3	7.5	30	54
Prosecco Wine (hectoliters)	46,6	30.7	2.1	110.7
Contact Duration (years)	42.8	11.3	10	50
Entry Investment per Shareholder (Euros)	13,200	27,300	0	200,000
Contract Renegotiation	Dummy Variable: 57.14% = yes; 42 86%			

2.2. Empirical Strategy and Results

The starting hypothesis is the Coasian recognition that there are "*costs of using the price mechanism*" (Coase, 1937, p. 3), therefore organization of the production can be carried inside the vertically integrated firm and not delegate to external separate markets. In a Williamson's framework (1979), the theory is refined at transaction level. The more complex, asset specific and uncertain the transaction, the higher the cost of the transaction (or the costs of using the price mechanism), the more different from neoclassical firms/markets, the governance within which production is organized and transactions occur. In this perspective, following Onofri (2008, 2014), we empirically investigate whether Prosecco cooperative wineries are transaction-costs minimizing structures. Transaction cost economics (TCE) acknowledges the role of contract terms in aligning marginal incentives ex ante and in preventing wasteful efforts to ex post redistribution of existing

surplus. Incentives alignment can be generated by the proper duration of the agreement that organizes production, as investigated in the empirical TCE literature (see for all, Joskow (1987). This implies that we want to test a relationship between complexity of production and contract duration. In TCE perspective, the duration of a contract is a very important indicator that often reveals the degree of intensity of the three key variables that affect transaction costs and related governance. In this view, the rule that provides for a term of more decades could be interpreted as an efficient and effective attempt to minimize transaction costs generated by the complexity of organizing and coordinating all the relationships and activities inside the social cooperative. A long time horizon could also be interpreted as an incentive for the cooperative shareholders to the commitment to the mutual purpose

We use a simple linear specification.

$$(1) \quad Contract\ Duration_i = \alpha_- + \beta_1 Xi + \gamma_2 Zi + vi$$

Where the dependent variable depends on two types of variables. Xi indicate the endogenous variables and Zi indicates instrumental (exogenous) variables. β and γ are parameters to be estimated. The model includes a constant and the error term. An instrumental variable zi, is a variable that can be assumed to be uncorrelated with the models error εi but correlated with the endogenous regressor xi. Therefore, selected instrumental (exogenous) variables represent variables determined before contracting (shareholder's entry investment, renegotiable contract). Shareholders have to pay a fee conditional on joining the contract/cooperative. The amount of the investment varies according to different contracts. This is a variable affecting the contract duration because it represents the shareholder's intensity of commitment that relates to the complexity of performance to be carried on by the cooperative. At the same time, the possibility of subsequent entry or exit accorded to shareholders is a renegotiation that provides flexible adaptation to the long-term agreement. The selected endogenous variables (grapes price and quantity, Prosecco grapes %) represent provisions that are jointly determined within the contract and that are jointly determined with the contract duration and subsequently the entry investment and the possibility to renegotiate the contract. They are indicators of the complexity of the transaction.

The model is tested using IV method with STATA 12. Table 2 shows estimation results[1].

[1] The dataset include the 16 wine cooperatives in the Prosecco area. Statistically this would include 100% of the feasible sample. See Ramsey et al (1996) for the statistical treatment of small datasets.

Tab. 2 – IV Empirical Results

Instrumental Variables	Dep. Var. (log) Contract Duration Estimated Coefficient
(log) Total Quantity (quintals)	0.28***
(log) Liquidation Price (Euros)	-0.15**
% of Prosecco Grapes over the total conferred grapes	0.34***
Constant	10.84
Instruments: (log) entry investment; contract renegotiation	

**** = 1% statistically significant; ** = 5% statistically significant*

A 1% increase in the grapes liquidation price negatively affects contract duration (0.15% decrease of duration). A 1% increase in total conferred quantity positively affects contract duration (0.28% increase of duration). An increase in the Prosecco percentage over the total conferred grapes also positively affects contract duration.

3. Conclusions

Results show that cooperative wineries, organized with longer term contracts (that include provisions on the minimum entry level of investment for each shareholders and renegotiation clauses), produce more grapes and more Prosecco at a lower price. This might imply that the larger the production, the higher is the need to organize it within a longer time horizon. The low(er) price paid for grapes (linked to longer contracts) might imply a long-term investment strategy (renewal of processing facilities) aimed at lessening price in order to increase the rate of self-financing. A higher share of Prosecco production may also be related to additional investments to be repaid at the second fermentation tanks. The higher transactions complexity and greater is the need to rely on durable organizational structures, in order to minimize transaction costs. In this perspective, Treviso cooperative wineries represent institutional efficient adaptation to complexity and asset specificity.

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THE ROLE OF THE RAW MATERIALS IN THE DEVELOPMENT OF A TUSCAN CRAFT BEER CHAIN

by *Veronica Alampi Sottini*[*], *Maria Cipollaro*[**] and *Sara Fabbrizzi*[*]

1. Objectives

Over the past two decades the craft beer sector has developed significantly both in Europe and Italy, despite the economic crisis that has affected the alcoholic beverages market (Donadini et al., 2016; Menghini, 2016; Aquilani et al., 2015; BoE, 2014). The success of the craft beers can be identified in the rediscovery of ancient brewing styles – synonymous with authenticity and tipicality – and in the introduction of innovative and creative recipes. These aspects have met the preference of those consumers more inclined to experiment with new aromas and flavours and eager to create a relationship with the specificities of the territory (Schnell and Reese, 2003) capable of giving uniqueness to the product (Cardello et al., 2016; Favalli et al., 2013).

In 2015 the Tuscan craft sector consisted of a hundred companies, mainly located in the provinces of Florence, Siena, Arezzo and Pisa (Menghini, 2016). The presence of beer farms on the regional territory is relevant (21, which represents 23% of the total), since national legislation recognized beer as an agricultural related production only in 2010 (Ministerial Decree 5 August 2010; G.U. 10/09/2010, n. 212).

This paper is part of a wider research project on "The craft beer chain in Tuscany" (Menghini, 2016).

The aim of the paper is to identify those factors that can be a source of success or represent critical issues for the development of a cereal-beer chain in Tuscany. Moreover, the paper meets specific needs for information required at the public level, after the promulgation of Law n. 154 28/07/2016 and of the Ministerial

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 ISBN 9788891786883

Decree 05/08/2010, n. 212, which introduced support measures aimed at encouraging the local production of raw materials useful to the process.

2. Methodology

The characteristics of the brewing companies operating in the regional craft beer sector, the degree of interest in buying regional malt and local raw materials and their willingness to support any higher costs for their purchase were analysed through a qualitative survey.

Meetings with experts in the sector allowed us to select 13 representative craft companies in terms of volume of production, years of activity in the market, use of regional and/or local raw materials. In addition, two agricultural breweries were selected, because of their importance in the territory.

3. Results

The results summarized through the SWOT analysis show how the future development of the craft beer sector must be sought in a further process of differentiation of the final product, leveraging not only the craft production process but also the local origin of the raw materials, such as malt and hop. These aspects put the agricultural breweries at the forefront, offering them interesting opportunities of both expanding their production systems and enhancing their cereal productions that, if sold as commodities, are progressively losing their value.

The main weaknesses resulting from the survey are mainly related to the malting process of cereals, currently carried out by large non-regional plants. Such critical issue could be overcome by micromaltation, which should in any case be associated with forms of horizontal integration of the process.

Product innovation and the growing demand for craft beer, not only in Italy, represent external opportunities for the development of the sector. However, two main risks are linked to these same opportunities: the first concerns the introduction on the market of "crafty" beers by the industrial companies and the second concerns the increasing number of new craft breweries which are not qualitatively to the highest standards. Although this is an exploratory analysis carried out at regional level on a sample that is not statistically significant, the results can be a useful tool for the public bodies for effective and efficient interventions to support the sector at different levels of governance. The public bodies play a strategic role in both disseminating knowledge about the product through the promotion of the territory and of

the local economy (organizing and promoting fairs and events), and supporting the creation of a network among the stakeholders of the sector, for the exchange of information and the creation of cooperative relationships.

In addition, the public sector could support the production of local cereals to be malted, given the interest of the beer masters in creating a product strongly rooted in the territory. Such action would also meet the claims of a consumer who is increasingly attentive to products that express their uniqueness through their strong territorial connotation, and thus giving the product not only a nutritional but also a cultural dimension (Choi and Stack, 2005; Cardello et al., 2016).

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HONEY PRODACTION PROCESS: MARKET AND INNOVATION

by *Antonella Cammarelle*[*], *Mariarosaria Lombardi*[**] and *Rosaria Viscecchia*[***]

1. Introduction

There is a large body of literature that analyse consumers' choices and attitudes about nutrition and health claims (Grunert et al. 2007), and there is a rapidly growing literature on the importance of the influence of nutritional and health claims on food purchasing choice and consumers' willingness to pay (Dean et al. 2012; Grunert et al. 2007). In general, products with a claim are clearly preferred and consumers react positively to this type of information and the presence of a health claim on food label increases willingness to pay (Bimbo et al. 2016), but the determining factors of choice differ between the food categories: the perception of healthiness of the product influence positively consumers' choice (Aschemann-Witzel et al., 2010).

In this context, product innovation can allow some beekeeping companies to differentiate their products on market from those of competitors. Honey enhancement strategies could focus on the transition from undifferentiated product, seen as ancient, declining or as a "remedy of seasonal illnesses", to a typical handmade product, seen as healthy and natural.

For example, with the reference to "acacia honey in barriques" honey loses its nutritional characteristics to acquire new hedonistic values (Barbieri, 2015). Differentiation strategies may also aim at creating new product packaging (Verdorfer, 2016).

This study aims to define the most appropriate strategies for dealing with the changing external conditions and to indicate the most suitable actions to

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 ISBN 9788891786883

compete on the market, for two business cases, through the SWOT-SOR analysis.

2. Materials and methods

The methodology used in this work is based on the succession of two complementary analytical techniques, SWOT (*Strenghts, Weaknesses, Opportunities, Threats*) and SOR (*Strategic ORientation*) analysis, whose integration is a model designed to define strategic guidelines for identifying and solving the problems of a system (Prickton, et al. 1998). Table 1 describes the logic with which the comparison is made.

Tab. 1 – Intersection between strengths and weaknesses with opportunities and threats

	OPPORTUNITIES (O)	**THREATS (T)**
STRENGTHS (S)	The S help to take the O?	The S help to limit the T?
WEAKNESSES (W)	The W block in taking the O?	The W block in limiting the T?

Source: Prickton et al., 1998

The score given to the answers ranges from 0 (not relevant) to 3 (the relevant is maximum). Table 2 indicates the strategies that can be outlined in relation to the greatest result obtained.

Tab. 2 – Definition of the strategic quadrant types

	OPPORTUNITIES (O)	**THREATS (T)**
STRENGTHS (S)	Attack strategy	Defence strategy
WEAKNESSES (W)	Change strategy	Crisis states

Source: Nardone, at al. 2008

3. Results

The above methodology has been applied to two beekeeping farms: *Rondinella Franco* located in Ripacandida (Potenza, Basilicata region) and *F.lli Anzivino* in Orsara di Puglia (Foggia, Apulia region).

Thanks to the interview, the questionnaire submission and the literature analysis it has been possible to realize the SWOT analysis, common to the both farms, whose matrix is observable in the following Table 3.

Tab. 3 – SWOT analysis, result of interview and literature

INTERNAL ENVIRONMENT	**EXTERNAL ENVIRONMENT**
Strengths	*Opportunities*
S1. Recognized quality of the products	O1. Consumer demand of high quality product
S2. Diversification of the food products	O2. High level of knowledge about healthy
S3. Loyalty of consumers	properties of beehive products
S4. Use of innovative technologies	O3. Interest about environmental concerns
	O4. Access to finance (ex. PSR 2014/2020)
Weaknesses	*Threats*
W1. Supply mainly in the food sector	T1. Climate change
W2. Need for financial resources	T2. Use of pesticides in agriculture
W3. Farm size (too big/too small)	T3. Risk of bee disease
W4. Relationship with distribution	T4. Market competition

The second part of the work concerned the elaboration of the SOR matrix for "Beekeeping Rondinella Franco" and "Beekeeping F.lli Anzivino" whose results are shown in Table 4.

Results show that, *Beekeeping Rondinella Franco* can follow a market attack strategy, based on the diversification of business activities such as the entry in the cosmetics sector. Another possibility could be the creation of "Api-tourism" (Woś, 2014). *Beekeeping F.lli Anzivino* can also follow a market attack strategy, based on the entry of a new honey food product, but at the same time it should continue to follow a defence strategy to limit the threats from the external environment.

The results have revealed that both small farms can follow an attack strategy on the market; they are subject to the limits of the farm size and to the threats arising from climate change and the use of pesticides in agriculture. The survey suggests that technological and product innovation could help them to contain the market competition and to increase the contractual strength with the distribution channels. Finally, the application of the study only at two business cases is limited to generally report the results to the

entire compartment, however the results obtained can be considered a good starting point for further insights.

Tab. 4 – SOR matrix, Beekeeping Rondinella Franco and Beekeeping F.lli Anzivino

STRENGHTS	OPPORTUNITIES				Sub tot O "a"	TREATS				Sub tot T "b"	TOT "a + b"
	O1	O2	O3	O4		T1	T2	T3	T4		
S1	3*/3**	3/3	2/2	1/0	9/8	0/2	0/2	0/2	3/3	3/9	12/17
S2	3/3	3/3	2/1	1/0	9/7	2/0	2/0	0/0	3/3	7/3	16/10
S3	3/3	3/1	2/1	1/0	9/5	0/0	0/0	0/1	3/3	3/4	12/9
S4	3/2	3/0	2/0	1/0	9/2	0/0	0/0	0/3	1/2	1/5	10/7
Sub tot S "c"	12/11	12/7	8/4	4/0	**36/22**	2/2	2/2	0/6	10/11	14/21	50/43
WEAKNESSES											
W1	1/3	0/3	0/1	0/0	1/7	0/0	0/0	0/0	0/2	0/2	1/9
W2	2/0	2/2	2/1	2/3	8/6	0/0	0/0	0/1	0/2	0/3	8/9
W3	2/1	0/0	0/0	0/2	2/3	0/0	0/0	0/0	1/1	1/1	3/4
W4	0/0	0/0	0/0	0/3	0/3	0/0	0/0	0/0	1/2	1/2	1/5
Sub tot W "d"	5/4	2/5	2/2	2/8	11/19	0/0	0/0	0/1	2/7	2/8	13/27
Difference "c - d"	7/7	10/2	6/2	2/-8	25/3	0/2	0/2	0/5	8/4	12/13	37/16

*Result related to Beekeeping Rondinella Franco/**Result related to Beekeeping F.lli Anzivino

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INTEGRATED FOOD SUPPLY CHAINS: THE CASE OF VARIETY CLUBS IN THE FRUIT SECTOR

by *Federica Monaco*[*], *Guido Sali*[**] and *Daniele Bassi*[**]

1. Introduction

The "club" system represents the realization of a novel organizational model for the provision of goods and services, in accordance with principles theorized by Buchanan (1965). Concretely, it consists of a voluntary-basis aggregation of manifold subjects, who are ensured to get exclusive benefits from their membership condition. Over the last decades, such a model has been implemented in the agro-food branch, particularly in the fruit sector, hampered by multiple conditions. Its spreading is here motivated by the chances it offers to overcome a scarcer competitiveness. Market globalisation, price competition, overproduction, lack of innovation, consumers' expectations for quality products have altogether urged for an economic reorganization of the entire fruit supply chain. In this regard, the so-called "*variety club*" allows the sector to take advantage from an innovative organization, based upon a strongly integrated and coordinated approach amongst actors. Unlike other forms of integrated chains, it is rather qualified as an overstructure made up of subjects who operate under formal contracts to be exclusively licensed for the use of a patented fruit brand. Whilst for other commodities chain contracts turned out to be ineffective, the fruit sector expects to take advantages from the club model thanks to (i) controlled supplied quantities, (ii) product differentiation, (iii) higher remunerations, (iv) response to consumers' demand for quality and appealing fruits, (v) facilitatation and government of price formation along the chain. Moreover, the possibility of joining the club for both individuals and their associations

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highlights the linkages with all the interventions promoting food chain integration and cooperation between operators.

2. Methodological approach

Up to now, the scientific debate about variety clubs is largely focussed on the fruit species, its genetic selection, biology and protection; very scant evidences depict their actual internal organisation and economic implications. This topic still preminently remains of current knowledge amongst experts, and not adequately communicated to general public, nor addressed by academia. Starting from the considerations arisen from a literature review, the study at hand is a concept paper, aimed at better investigating the composition of variety clubs. Particularly, it elucidates various subjects who take part in a typical club model, explores strength relationships amongst them and sheds light on their bargaining power.

3. Results and discussion

The creation of a variety club relies upon a patented fruit, which use of permission is released to club members by means of formal contracts. This way, patent-holder defines roles and tasks to be performed by each subject, sets clear rules to which signatories are subordinate, holds efficient control over the supply chain. Exclusivity involves propagators, producers and/or their associations; entrusting one or few large retail distributors is also possible, even with uncertain and contrasting results. Licensed exclusivity is granted to signatories on the payment of membership fee and royalties, which cover club administration and management expenses. Such elements represent additional costs for involved actors lasting for the entire duration of the contract and may markedly impact on their annual budgets.

The coordinator commissiones nurseries to propagate a pre-defined number of plants, with no possibility of an extra-propagation without its agreement. Plant material is to be conferred only to fruit-growers members of the club, who assure product placement. This may favour the diversification of both nurseymen's supply and income source; however, no additional margins can be obtained on the sale price to fruit growers, since this element is set by the coordinator.

Likewise, fruit-growers are burdened with the costs of joining the club. Despite this, the introduction of patented varieties into the production pattern

may create additional revenues and enable producers to differentiate their supply. At the same time, innovative products can find a collocation on a stable market. Nontheless, fruit-growers seem to be the weakest subjects of the entire model. Their decision-making capabilities and rooms of manoeuvre are strongly constrained by multi-year production contracts and medium-long term investment: an arranged number of plants is provided, at a predetermined selling price, to be conducted in a precise area and aimed at a quality production, without the possibility of influencing quality criteria. The involvement of a producer organization would, instead, enforce the bargaining power, either when arranging contracts or managing post-harvest activities.

Also commercialization and marketing-related services must be operated by structures and centres members of the club. They can be entrusted either to specific companies or to cooperatives of producers, who are the exclusive licensees of marketing rights. In the latter case, they take care of promotional activities and coordinate and control the production process, from production programs to the set of various standards. This is, indeed, the last step of the food chain operated within the club structure.

It is noteworthy that other subjects are engaged in economic transactions with the club, without being members. It is this the case of distributors entrusted as exclusive licensors. In most cases, variety club addresses large retail distribution because of the collection and purchase of larger amounts of product. Retailers are charged with the distribution of fruit variety as fresh product, while under-quality fruit and non-usable wastes can be processed and still commercialized without indications of the registered trademark. Advertisement and promotion activities are emphasized to obtain price *premia* from final consumers, and ensure higher returns to both patent holders and fruit-growers.

The vertical integration of variety clubs is to be considered a valid solution for strengthening the fruit sector, rather than the best solution ever. In fact, though all motivated by common and utilitaristic purposes, t potential club members combines in a large array of management schemes, levels of arrangement, control and forms in between. Therefore, neither a unique reference model nor an optimal structure per sè can be easily identified. The present contribution provides first evidences in this sense and aims at being a further stimulus to pursue research in this direction. More efforts should also be put into deepening role and motivations of actors, utilities benefitted and value chain analyses, which are still unexplored. Such approaches are at least needed to verify the economic convenience of joining the club and identify bottlenecks that limit the efficiency of the model.

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SUPPLY CHAIN IN BASILICATA: AN OPPORTUNITY FOR DEVELOPMENT AND COOPERATION

by *M. Assunta D'Oronzio*[*] and *Manuela Pascarelli*[**]

1. Introduction

The National Strategic Plan (NSP) identified supply chain value as a qualifying element for the 2007-2013 programming period. The main objectives of the 2007/2013 Basilicata Rural Development Program (RDP) are to consolidate aggregation, improve co-operation between main actors, rationalize economic activities, encourage concentration of production, increase competition and promote typical traditional foods.

In order to address some of the structural and economic aspects of rural and agricultural Basilicata, the Region focused on the Integrated Supply Chain Project (ISCP), recognizing that the agricultural sector has a strategic role in helping to relaunch the territory.

As a rather new procedure within the framework of rural development policy, a long and complex process based on intense consultation is envisaged which requires specific management skills, including various implementation procedures, and the identification of levels of implementation accountability (RRN, 2010).

The Basilicata region, along with the technical support of CREA (Basilicata Political-Bio-economics), reviewed the agricultural situation, in particular its productive sectors, and plans to implement intense consultation activities to stimulate the involvement of actors.

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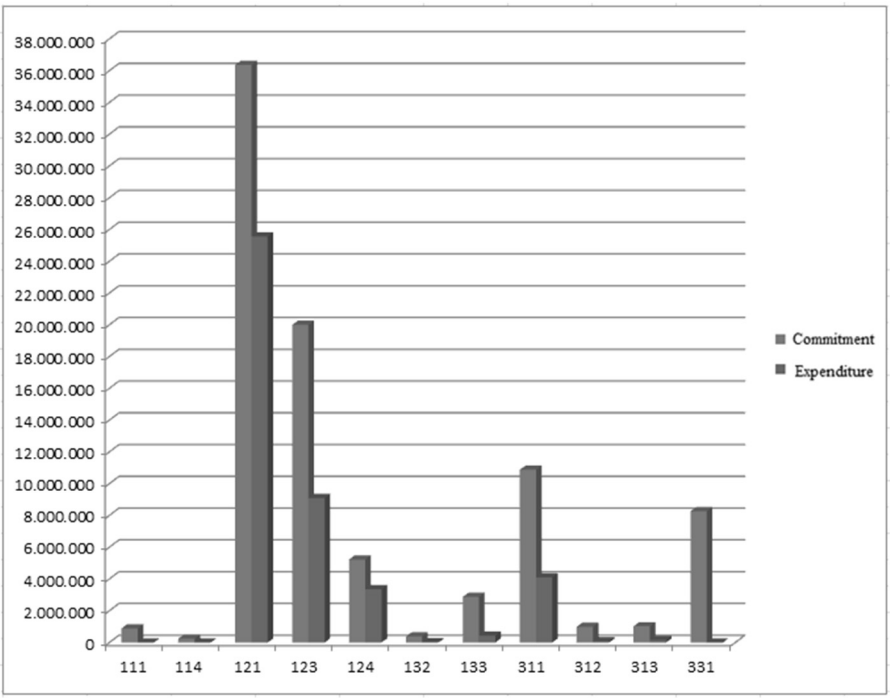
The ISCP call for proposal allowed a large number of companies to work in partnership and share planned paths to new markets or to substantial economic development.

The 2007-2013 Basilicata RDP measures involved in regional financing were related both to Axis I "Improving the competitiveness of the agricultural and forestry sector" (111 - 114 - 121 - 123 - 124 - 132 - 133) and Axis III "Quality of life in rural areas and diversification of the rural economy" (311 - 312 - 313 - 331). For each measure, the regional public call for proposals provides dedicated public resources of a total of MEURO 90,00, 66,85 for Axis I and 23,15 for Axis III.

These resources were equally divided between regional and territorial ISCPs.

The ISCP did not reach programmed spending targets, although improvements were recorded. The 486 ISCP beneficiaries spent MEURO 40,07, 53% of the committed budget. Figure 1 shows individual ISC's measures.

Fig. 1 – Commitment and expenditure of ISCP for RSP Measures



Source: CREA's processing on Basilicata Region data

Structural measures 121 and 123 of the RDP represent over 80% of ISCP expenditure; 90% plus 311 other structural measures relating to diversification in Axis III of the RDP. Figure 1 shows support measures for entrepreneurship and territorial development were omitted during the implementation of the supply chain considered important by the regional administration and included in the menu of measures which could be activated at the initial stages of the process. The ISCP seems to follow the RDP trends focusing on the structural measures during the various programming periods (Mantino *et al.,* 2017 Agriregionieuropa).

2. Materials and methods

CREA (Policy and Bio-economics) and Basilicata monitored the implementation of ISCPs using two level methodologies. The first level required each ISCP to draw up a summary table using data from the Managing Authority (MA) regarding the number of projects approved in relation to each measure and their amounts. This financial data was compared with the real progress of the ISCP. The second level required the development and delivery of a qualitative questionnaire, common to all sectors, aimed at investigating the peculiarities of each ISCP and encompassing transversal themes. It was possible to specifically verify: the existence of contact between the beneficiary companies, difficulties encountered during the three years following the publication of the notice, interventions carried out, financial resources used, beneficiary requests, level of subject integration, marketing phase organization, implementation timing, how proposing party informed beneficiaries of ISCP performance and impressions and expectations of the experience. For each ISCP, the positive elements of the chain, implications for the territory and beneficiaries and suggestions for the next programming were reported. This methodology provided a comprehensive view of the diversified development of chain processes, depending on product sector. It acted as an instrument for the regional MA to gain clarity on issues encountered by participants during the implementation phase of the call for proposals and defined timely corrective solutions, seizing opportunities offered by integrated design for some production areas and received suggestions for future scheduling.

3. Results

The interviews proved that the ISCPs increased the capacity for cooperation between companies and often managed to create networks depending on their product sector.

The philosophy of the adopted approach highlighted positive aspects and also some issues requiring a series of revisions regarding the 2014-2020 programming, including improving the overall governance of ISCPs and in particular the recognition of leading subjects as intermediate subjects in the governance of chain-design processes, which is an area that needs reinforcing.

In consideration of future integrated supply chain planning for 2014-2020 programming, some leaders have made suggestions which take into account the needs of the specific area of belonging. The obligation to transfer the individual holding to the ISCP should be maintained and the obligation to activate certain measures should also be maintained as additional constraints could be added and possibly applied to the specific sub-fund association and pass all marketing through ISCP, a consideration to include ISCP other subjects capable of creating new synergies in the ISCP.

In conclusion, some actors have embarked on the ISCP with the enthusiasm of those who knew how to obtain incentives for aggregation and to discover tools to overcome the critical issues, enhance the quality of products and make a significant investment in research.

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ITALIAN CONSUMERS' ATTITUDES TOWARD ALTERNATIVE FOOD MADE WITH INSECTS AS INGREDIENTS

by *Claudio Nigro*[*], *Roberta Sisto*[*], *Enrica Iannuzzi*[**], and *Gianluca Nardone*[***]

1. Insect as food: a brief literature review

By the year 2050, it is expected that the global population will have exceeded the 9 billion mark. As a consequence, worldwide demand for food and feed is predicted to increase by as much as 70%, placing added pressure on already scarce agricultural resources (Smith and Pryor, 2014). In response to food security concerns, there is increased global interest in the use of processed animal protein developed from insects as alternative food and animal feed. Processed animal protein show a significantly higher feed conversion rate than livestock animals. This means that they are much more efficient at converting feed into body mass (Van Huis, 2013). Additionally, as a source of protein for direct human consumption, insects offer several advantages over traditional meat sources. Furthermore, insect production is more environmentally friendly than the production of conventional livestock (Oonincx et al., 2010).

Insects are regularly consumed in many countries around the World, but in Western Countries, consumption of edible insects is restricted to experimental restaurants as a delicacy and to specialized food items based on insect protein (Gere at al., 2017). There are three main barriers affecting their consumption: consumer acceptance, technology and regulation.

In this scenario, it is possible to collocate the recent debate focusing on the most relevant determinants of consumption of food with processed animal protein developed from insects, producing a radical change in the diet of a large part of the population.

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 ISBN 9788891786883

In particular, in managerial studies, the debate focuses on consumer behavior on the insect-based food consumption (or their components). Interesting studies have identified a number of factors affecting the degree of opening or acceptability to these 'radical innovations' with respect to traditional national food (Tan et al., 2015; Verbeke, 2015). The recurrent themes emerged by the literature review, among the various factors affecting the acceptance/rejection of food, attitudes, beliefs and opinions of consumers are relevant and, in some cases, decisive. However, this part of the literature appears very fragmented.

2. Purpose of the paper

Therefore, starting from preliminary reconstruction of the theoretical framework, with particular attention to the previous empiric studies focusing on barriers to consumption and drivers of eating food made with insects as ingredients (Hartmann et al., 2015; Materia and Cavallo, 2015; Tan et al., 2015; Verbeke, 2015; Gmuer et al., 2016; House, 2016; Gere et al., 2017; Tan et al., 2017), the research aimed at exploring the Willingness To Consume (WTC) insect-based food. This element represents valuable prerequisite for implications to determine whether and how to reorganize food chains.

In particular, the study developed an empirical research to verify which predictors would affect behaviours in consuming 'traditional' food – as a pizza – made with innovative ingredients – cricket flour and spirulina. The choice of this 'familiar' product to achieve the research objective was determined by the fact that pizza is a widely known and consumed product in Italy, and well known abroad.

3. Empirical research

Coherently with the research objective, from methodological point of view, the conjoint analysis technique was adopted to measure consumers' multi-attribute utility functions because is based on the preferences expressed by consumers regarding a set of alternatives (combination of attributes – product profiles) (Green and Srinivasan, 1990); starting from the consumers opinion with regards to the different product profiles, the conjoint analysis determines the importance of the different attributes in the consumer choice.

With reference to the empirical research, from the combination of attributes and price levels, six (6) different product-pizza profiles, on a total of 15 combinations, were obtained.

In order to get the 'Revealed Preferences', a questionnaire was submitted through popular social media services to a random sample of potential customers (Academia.edu, LinkedIn, Twitter, Facebook's personal and academic pages). Every respondent had choice a product-profile by using a specific ranking scale.

It's necessary underline that the empirical research was divided in two steps: the first was characterized by *un-knowledge* of innovative ingredients (as blinded-test); the second was characterized by *knowledge* of innovative ingredients. In this way, after the revelation about the type of innovative foods (ingredients), the analysis has allowed to record the possible rate of respondents' rethinking.

Besides, the WTC insect-based food has been compared with the attitude to choice healthy and/or functional ones. Indeed, the survey aimed to verify whether and to what extent the 'insects food resistance' was referred to intrinsic aspects of the product rather than to others (psychological and cultural, above all).

4. Findings

The results are based on 587 (with hidden ingredients) and 175 (with ingredient showed) correct and complete answers collected in 90 days, after the link sharing.

In *un-knowledge* conditions, the most chosen product profiles by respondents were: traditional pizza with flour 00 and pizza made with cricket flour. It is probably that this choice is linked to the higher protein content of the configured product. The less chosen product profile was the totally innovative product (made with cricket flour and spirulina), probably affected by an higher price level.

After the revelation, the preferred product profile was traditional pizza with the functional ingredient addition; the less chosen product profile was the product with innovative ingredient addition – cricket flour.

The changing of the respondents' choices emphasized the actual consumer's substantial attention to psycho-physical well-being, which leads to a conscious choice. At the same time, the analysis revealed a clear reticence of the consumer about the consumption of insect-based food, in the prevalent literature called entomophagy. On the contrary, the consumer showed an

increasing attention to the functional food, coherently with attention to his psycho-physical well-being.

5. Originality and limit of the paper

In writers' opinion, the research innovative aspect is represented by the focus on Italian consumers, that as well-known, have a strong culinary tradition heavily affecting their food habits.

The limit of this study is due to the on-line questionnaire submission and, thus, the random sample composition. However, it offers interesting insights to the scientific community.

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ENTOMOPHAGY: REAL OPPORTUNITY OR ILLUSION?

by *Luca Iseppi*[*], *Enrico Gori*[**] and *T.F. Margherita Chang*[*]

1. Introduction

It is widely accepted that by 2050 the world will host 9 billion people (FAO, 2013). To cope this number, current food production will need to almost double. Land is scarce and expanding the area devoted to farming is rarely a viable or sustainable option (FAO, 2013).

The deficit in the production of protein has become one of the most important problems in Europe; in fact, about 80% of European protein crop requirement is imported from non-EU countries (Van Huis, 2013; Hoek et al., 2013; Oonincx and de Boer, 2012).

Without these premises, insects can become a sustainable production for several reasons such as: a) high conversion ratios (FAO, 2013); b) reduced production of pollutants and GHGs (Van Huis et al., 2013; Rossitto et al., 2017); c) possible biological breeding; d) reduced use of soil and water compared to livestock and pigs.

This research applying, for the first time, the Rasch model on 31 items of a survey on EU and extra UE citizens to assess the respondents availability of the to accept insects and/or insect-based products in their diet. The Rasch model allows to understand which steps can be taken to increase the consumption of insect by consumer.

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 ISBN 9788891786883

2. Materials and methods

To survey the propensity of consumers to entomophagy it was administered an on-line multilingual questionnaire (italian, English and Spanish).

The multiple-choice questionnaire was filled in by 254 people from EU and extra EU countries and is divided in two sections: a) the first section is dedicated to the background of the consumer (age, gender, education, country of origin, personal food habits); b) the second is focused on the attitudes to entomophagy (31 specific items). In this part, a question on the appreciation of unusual foods (squid, octopus, offal, ecc.) was inserted to check for food neophobia (Verbeke, 2015). The questionnaire ends with an open question to assess the availability of respondents to accept insects and / or insect-based products in their diet.

The answers to the questions have been coded according to an ordinal scale (1, 2, 3, 4 ...) that associates the lowest scores of the response to the lowest level of "propensity to entomophagy", while the highest scores to those responses denotes on the contrary a highest degree of "propensity to entomophagy.

The application of Rasch Model (Generalized Rating Scale Model) allows getting a summary of the various items to measure the propensity of the sample to insect consumption (Gori et al., 2017).

3. Rasch models as basis for Fundamental Measurement

The model adopted is able to produce measures of the dimension of interest belonging to the class of Rasch models (Rasch, 1960). Their most important property is known as specific objectivity: the comparison between two stimuli should be independent from any particular individuals were instrumental for the comparison; and it should be independent from any other stimuli within the considered class were or might also have been compared.

The Rasch model for dichotomously scored items may be extended to response formats with more than two ordered categories (Andrich, 1978; Wright and Masters, 1982):

(1) Rating Scale model: $\ln\left(\frac{P(X_{ij}=k)}{P(X_{ij}=k-1)}\right)=\alpha_i-\beta_j-\tau_k,\ X_{ij}\in\{0,1,2\cdots K\}$,

where τ_k is a "threshold" that measure the difficulty to reach category *k,* identical for every item.

4. Preliminary results

The multilingual survey involved individuals from different backgrounds and different eating habits (about 8% were vegetarians), with different degrees of education (50% was graduated) and age (63.5% was between 20 and 30 years old).

The data analysis showed that the majority of participants was already aware of the term entomophagy and 17% of participants have already eaten insects.

The most represented countries, in the survey, are Italy and Mexico. The questionnaire showed that 91% of Italians have never eaten insects respect the Mexico where this percentage fall down to 20%. This performance shows that the entomophagy has cultural bases.

In order to obtain a measure of "propensity to entomophagy" for each individual, the model uses 18 items selected from the questionnaire.

The reliability index of the model is 0.90, for the people, while for the items is 0.99. These are very high values that underline the goodness of the scale adopted. The Alpha of Cronbach is quite high (0.86). The average level of measurements of the people is -0.92 while that of the item is conventionally equal to zero. Item infit indices fluctuate between 0.72 and 1.30, and the outfit ranges between 0.18 and 1.21, thus within the limits set for the good fit in of a Rating Scale Model (Bond and Fox, 2007, p. 243).

The ranking of the items is useful to understand what steps are needed to lead a subject from the lowest level of propensity to entomophagy (do not know what is entomophagy) to the highest level of the scale (the insects are an ingredient to prepare a meal). The process of knowledge starts from the information that helps the consumer to increase his propensity to eat insects to arrive at the consumption of processed insects (cricket and grasshopper) until to include the insects in the daily diet.

5. Conclusions

The first time use of Rasch model to measure the propensity to consume insects-demonstrated that entomophagy has cultural bases. To overcome the cultural barrier, it is useful to let the consumer know which products already contain processed insect e.g. flours. This is the first step able to enhance consumer's food culture about this new source of food. It is rational to assume that if the correct steps are taken, this new source of food will become

increasingly important in the near future and will require a re-organization of the agro-food supply chains.

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SUNFLOWER OIL: FROM COMMODITY TO FUNCTIONAL FOOD FOR NEW CUSTOMERS AND MARKETS

by *Federico Nassivera*[*], *Franco Rosa*[**], *Mario Taverna*[*] and *Luca Iseppi*[*]

1. Introduction

The sunflower seed oil is an edible seed oil used as salad oils, dressing, cooking oils, liquid and solid shortenings, spreads and ingredients in several foods, including bakery products and fried food. Our interest is to explore the potential market of modified sunflower oil composition as functional food by testing a sample of potential consumers using the SEM approach.

2. Objectives of the research

The main objective of this work is to explore market potential of modified sunflower oil compositions according with the perceived quality of the functional goods including the claims for health due to metabolic benefic action of the eicosanoid.

3. Research framework and methodology

The methodology consists in modelling the Health Motivations (HC) and Environmental Concerns (EC), affecting the consumer's perceived quality of sunflower oil, and the consequent Behavioral intention (BI). Some authors have focused the importance of marketing strategies (Rosa et al., 2014; Cencic et al., 2010), public initiatives and macro marketing (Kilbourne &

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 ISBN 9788891786883

Carlson, 2008; Becker et al., 1977; Diamantopoulos et al., 2003). A measurement scale is proposed to test the constructs as antecedent of perceived quality. A theoretical model is designed to analyze the causal relationships between Health Motivations (HM), Environmental Concerns (EC), perceived attributes of product quality (PQ) and Behavioral Intention (BI). The following hypotheses are tested:

- hypothesis 1 (H1): Health Motivation (HC) have a significant impact on extrinsic attributes of perceived product quality (PEXT);
- hypothesis 2 (H2): Health Motivation (HC) have a significant impact on intrinsic attributes of perceived product quality (PINT);
- hypothesis 3 (H3): Consumers' Environmental concerns (EC) have a significant impact on Extrinsic attributes of perceived product quality (PEXT);
- hypothesis 4 (H4): Consumers' Environmental concerns (EC) have a significant impact on Intrinsic attributes of perceived product quality (PINT);
- hypothesis 5 (H5): Extrinsic attributes of perceived product quality (PEXT) positively affects consumers' behavioral intention (BI);
- hypothesis 6 (H6): Intrinsic attributes of perceived product quality (PINT) positively affects consumers' behavioral intention (BI).

A number of 417 questionnaires were submitted with several sections exploring information about personal and shopping habits, socio-demographic characteristics, measurement scales for each of the constructs proposed in the theoretical model.

Data analysis was performed using Factor Analysis and Structural Equation Modelling (SEM). The factor analysis, with the Varimax oblique rotation approach, was used to identify the five latent constructs of the model (HC, EC, PEXT, PINT and BI). This is recognized as a useful criteria to reduce the original variables in four latent factors, with linear combination with minimum loss of information. The reliability of each factor was analyzed with the Cronbach's α, and all respect the threshold level value of 0,7. The Structural Equation Model (SEM) was implemented using the LISREL 9.1 software. The analysis conducted with LISREL allowed to test the hypotheses imposed in this causal model. It was evaluated via several fit measures, which suggested a reasonably good model fitting according to the quoted literature.

4. Results and conclusions

The existence of direct causal effects among the latent variables HM, EC, PEXT, PINT and BI was confirmed by the fit indexes from the SEM analysis. The incremental fit indexes gave an indication of the good adaptation of the conceptual model: 0.86 for NFI and 0.90 for the CFI. An analysis of the residues' indexes also provided useful insights about the model fit. With RMSEA the value of 0.09 was an acceptable indicator of adaptation. The relationship between Health Motivation and perception of Extrinsic attributes of perceived product quality was positively significant ($\gamma = 0.21$, $t = 2.45$), supporting H1. The relationship between Health Motivation (HC) and perception of Intrinsic attributes of perceived was positively significant ($\gamma = 0.25$, $t = 3.01$), supporting H2. Perception of product quality of extrinsic attributes positively affected the consumers' behavioral intention (BI) ($\beta = 0.68$, $t = 5.18$), supporting H5. Consumers' Environmental concerns had a significant impact on perception of Extrinsic attributes of perceived product quality ($\gamma = 0.28$, $t = 3.01$), supporting H3. In supporting hypotheses, the model depicted a particular consumers' reactivity to this functional product: a significant attention to issues of health motivations, had a positive influence on perception of extrinsic attributes of perceived quality, and a consequent positive attitude to behavioral intention to buy. The conclusion is that retailers could use these results to assess their marketing strategies accordingly to the reactivity of the consumers not only for aspects related to a healthy product, but also to attributes of environmental sustainability.

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SUGARCOATING FOOD TECHNOLOGIES. THE EFFECT OF DIFFERENT INFORMATIVE MESSAGES ON CONSUMERS' ACCEPTANCE OF LONG-LIFE FISH FILLET

by *Eugenio Demartini*[*], *Anna Gaviglio*[**], *Piermichele La Sala*[***] and *Mariantonietta Fiore*[***]

1. Introduction and objectives

Due to a natural aversion to novelties, consumers often oppose food technologies. On the other hand, food innovation increases social welfare, for example in term of increased safety and security, better taste, more convenience at lower price and improvement of nutritional properties (Lusk et al., 2014). Thus, studies investigating both the determinants and the interventions to increase food technology acceptance may help to fill the gap between consumers' ancestral skepticism towards innovation and the rational arguments that support it.

Building on these premises, an on-line survey has been conducted in two samples of consumers from Northern and Sothern Italy on the acceptance of shelf life extension (SLE) technology by 10 days on fresh fish with the aim of exploring the persuasive effect of informative messages on different consumers.

2. Methods

The data for the analysis have been collected via an on-line survey conducted in two samples of consumers from Northern and Southern Italy. The collection of 354 completed questionnaires have been done during January-March 2017. Participants received an invitation via mail and started the survey introduced by a brief description of the research topic. The next step involved the evaluation of the fictional Sea Bream fillets presented after the exposition to an experimental informative message. For the evaluation task,

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 ISBN 9788891786883

a specifically created picture of the product with a claim indicating the "10 extra-days" of shelf-life guaranteed by a new technology was presented along with the information. The message was assigned to each participant by random selection from a set of four conditions. In the first condition, consumers were informed that the new technology guarantees ten extra-days of shelf-life (Control condition). In the second condition, the message inform that the ten extra-days of shelf-life come with no change in term of product quality (Info_Q condition). In the third condition, the ten extra-days of shelf-life are presented as helping in reducing food waste (Info_W condition) and, finally, in the fourth condition, both information in second and third condition are provided (Info_Q*Info_W condition).

The product is evaluated using 12 different items. The first item specifically regard the evaluation of the perceived advantages of the shelf-life extension technology in comparison with the traditional product (10-points semantic differential scale). Other seven items are used to measure the perception of the effect of the SLE the following product characteristics: taste and flavor, environmental friendliness, safety, easiness to cook, easiness to preserve, naturalness and, finally, freshness (all items are valued using a 7-point semantic differential scale). Finally, the over-all liking of the product is captured using the expression of agreement towards the following four statements: 'The product is attractive', 'I would suggest it to my parents and friends', 'I would buy this product' and 'The product looks good' (all items are valued using a 7-points Likert scale).

Further information on determinants of food choice and acceptance of new food technologies are collected using two psychometrics scales, namely: the Food Values (FV - Lusk and Briggeman, 2009); and the Food Technology Neophobia Scale (FTNS - Cox & Evans, 2008). Socio-demographics, food technology knowledge and fish consumption data of each respondent completed the survey.

3. Preliminary results

Considering the collected questionnaires (354 subjects), preliminary analysis shows that information treatments do not significantly change consumers attitudes towards SLE applied to fresh fish product. Nonetheless, depending on the area of residence, information treatment determined some changes in consumers' attitudes. In fact, we found that people living in coastal areas are more sensitive to both message regarding product quality (p= 0.062) and impact of new food technology (p=0.031). As expected, provision of positive

information about the technology increased the liking of the technology especially in coastal areas residents (Figure 1 and 2).

Fig. 1 – Effect of information treatment about SLE impact on product quality compared to Residence

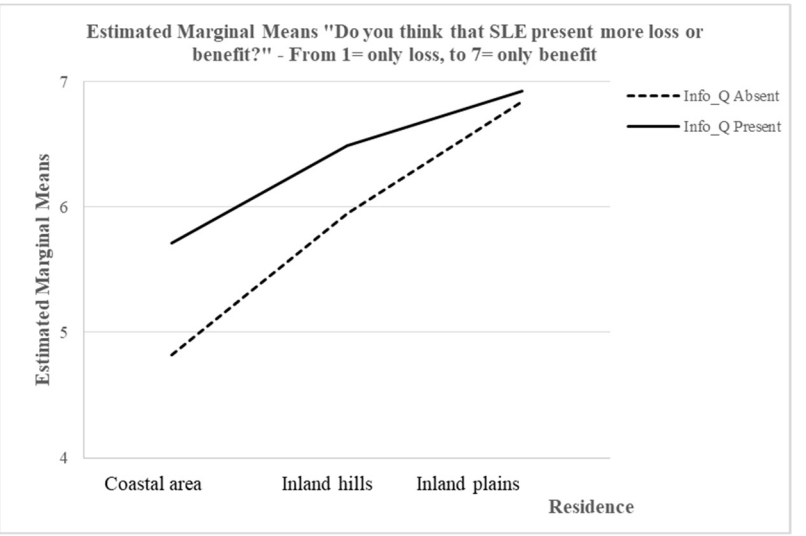
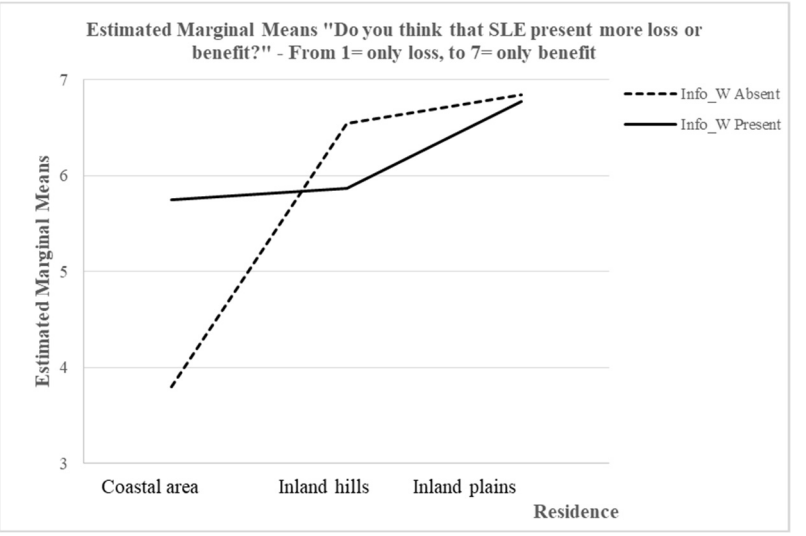


Fig. 2 – Effect of information treatment about SLE impact on food waste compared to Residence



These results confirm the differences found in previous literature on Italian consumption of fish (see Cosmina et al., 2012; Gaviglio et al., 2014) and suggests that different consumption patterns may moderate attitudes towards technology applied to fish industry. Thus, different marketing strategy and industry policy should be considered in different territories. Interestingly, the same effect is found in the overall liking of the fictional product presented, but it is not found in the explicit evaluation of its specific characteristics. This could be due to fact that simple information may act in increasing simple overall positive attitude towards foods, while if consumers are told to express their ideas about rationale features such as "how much the product is fresh or preserved" the information impact is diluted by deeper reasoning. The author acknowledge that no strong conclusions can be derived by these preliminary results. However, the effects measured (or not) suggest that marketing and policy interventions based on rational informative message about intrinsic characteristics of the products may fail in change consumers' attitudes towards sustainable products.

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This book contains the proceedings of the LIV Conference SIDEA and the XXV Convention SIEA, which were organized by the Department of Economics of the University of Foggia, for the first time, with the formula of a joint Conference titled “Cooperative strategies and value creation in sustainable food supply chain”, held in Bisceglie-Trani, from September 13th to 16th, 2017.

Cooperation in all its forms represents a valuable paradigm to define new horizons of development and build new organizational models of value creation according to a sustainable approach not referred to a single unit, but to the entire supply chain. Consequently, research perspectives affect the value added distribution issues along the value chain, the agricultural supply regulation, the social responsibility, the ability to offer a higher degree of food safety, and the promotion of organizational and social innovation.

Nevertheless, these concepts, which are valid in themselves, risk being infected by an exasperating interpretation of the current productivist logic and, thus, lose sight of the same value of those cooperative strategies and of the logic of fair distribution of the value, generated within the agri-food supply chains, and that this conference has debated.

Compared to all this, Italian agricultural economists wanted to reflect on how to bring the issue of cooperation back to the centre of economic logic and the governance of agri-food supply chains, also in relation to the use of environmental factors, which must be increasingly aimed at respecting the principles and values of the circular economy.

In this framework, the thematic areas, in which the First Joint SIDEA-SIEA Conference were structured, have allowed us to investigate the issue in all its aspects, starting from the analysis of the main production and consumption models, up to organizational models, forms of territorial, sectoral and environmental cooperation, and policies with which to add value to the supply chain.

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La passione per le conoscenze