164th EAAE Seminar

Preserving Ecosystem Services
via Sustainable Agro-food Chains

PROGRAMME

European Association of the Agricultural Economists (EAAE)

Mediterranean Agronomic Institute of Chania (MAICh)

Mediterranean Agronomic Institute of Chania (MAICh)
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Oral presentations

THURSDAY, 06 September 2018
SESSION 1A

Alternative food systems and the provision of eco-system services

Room: PYTHAGORAS

Chair: Bavorova Miroslava
Urban Agriculture as new concept of Food Production
- opportunities and limits

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Today, one of the most promising methods of agriculture is urban food production. Urban farming is not a new concept, but it is now more important than ever with climate change and the rise in population and urbanization. New technologies and methods of farming in urban environments are being rapidly developed to supplement the current food supply in cities and encourage urban greening to improve the environment. Urban farming can produce higher yields of crops for the same amount of space than rural farming with its focus on high-efficiency, eliminates the need for most of the economic and environmental costs of transportation and preservation required for industrial rural farming, and also grants access to healthier food for low-income areas. Limitations to urban agriculture include poor quality of soil and topsoil (due to litter and pollution), scarcity of clean irrigation water, especially in dry seasons and the typical pests, weeds, and diseases that impact agriculture anywhere and the scarcity of space. Contaminants particularly restrictive to the use of urban soils include the heavy metals lead, cadmium, and arsenic, as they are widely distributed and/or have especially detrimental effects. Their concentration consists of natural (bedrock sourced) and anthropogenic components, although anthropogenic influences tend to be substantially stronger in urban settings. In general, heavy metals either can serve as essential trace elements or have limited physiological value. They are often toxic in higher concentrations as they are persistent in soils (either very slowly degradable, or not at all) and tend to accumulate in animal, human, and plant tissues. These conditions are a particular challenge for organic farming in the city. All of these factors are a challenge for ecological production in the city. The contribution shows opportunities and limits of organic gardening / farming in the urban ecosystem and gives examples from Berlin, Havana and Cape Town.
Valuation of willingness to pay for public goods provided by agriculture in a semi-urban intensive agricultural production region: The case of the Marchfeld

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In the context of an upcoming CAP-reform which will most likely condition payments to farmers stronger on a measurable provision of public goods (PGs) and ecosystem services (ESS), the aim of this study is to elicit the willingness to pay (WTP) for public good-type ecosystem services provided by agriculture in the Marchfeld, a dynamically developing and semi-urban region in Austria. Situated between Vienna and Bratislava the Marchfeld is marked by an intensive agricultural production and at the same time rising environmental awareness of the local population. For this purpose, we carry out a discrete choice experiment (DCE) for the three PGs groundwater quality, landscape diversity and climate stability, which were pre-selected in a participatory approach via focus groups. Due to high preference heterogeneity we estimate a random parameters logit model (RPL) and include interactions with socio-demographic factors in order to further disentangle differences in preferences. We find a positive and significant WTP for all three public goods, with groundwater quality being most important for the respondents, followed by landscape diversity and climate stability. In our case, inhabitants of an intensive agricultural production region therefore have a positive MWTP for an improvement in the provision of PGs by agriculture. We can also show that MWTP varies considerably according to certain socio-economic factors. Specifically, younger respondents have a higher MWTP for an improvement in groundwater quality and climate stability, while older respondents show a higher MWTP for an improved landscape diversity. Also, farmers and locals show a lower MWTP for in improvement in groundwater quality and landscape diversity compared to non-farmers and nonlocals. Especially the observed preference heterogeneity with respects to locals and non-locals should be of particular interest for policy-makers in other semi-urban intensive agricultural production regions, which are also subject to in-migration from adjacent cities, as in such regions a higher MWTP for an improved provision of PGs is likely to exist.
Urban Agriculture (UA) is playing a significant role in supporting food security in developing countries. Urban Agriculture involves a great variety of typologies and policies; each could affect the local food systems at different levels. International organizations and local governments are trying to collaborate in order to develop UA policies better fitting the different context’s characteristics. The main objective of this work is therefore to contribute to the definition of a theoretical framework for the analysis of UA, focusing on supporting the developing countries UA policies. To this end a literature review was carried out and the following approaches emerged, suggesting a possible integrated framework for UA analysis: the classification of UA types, policies and services; the impact of UA on the local food systems; the factors affecting UA development. The literature analysis results show the existence of various typologies of UA differentiated by market orientation (business or social oriented) and governance (top-down or bottom-up) each of them has a different impact and drivers. Part of the theoretical approaches examined focus on the UA impact in terms of reduction of the metabolic rift from an ecological, social and individual point of view. In particular, the reduction of social rift could enable local food systems to be less vulnerable to crisis and more resilient. Urban systems resilience, in particular regarding local food systems, can be affected by Urban Ecosystem Services (like UA) consequent to different UA policies; this can positively influence the urban systems’ response to crisis both from an individual and collective perspective. A context-tailored UA policy and public communication strategy raising the Urban Farmers awareness of the benefits provided by UA, can enhance the participations to urban agriculture, increasing the individual and collective resilience and reducing the metabolic rift. To this end a body of literature considers the assessment of motivations and needs a useful tool to better understand the users’ perceived benefits derived from UA. The contribution of motivational frames that influenced people to start cultivating in cities provides a useful theoretical framework to the definition of effective and efficient UA public policies’ analysis. The work showed that the possibility of integrating the different approaches to the study of UA exists; it is therefore possible to design a first proposal for an integrated theoretical framework supporting: i) the development of UA policies tailored to the different developing countries contexts and UA typologies; ii) enhancing the urban food systems resilience by involving different dimensions of development (social, economic and environmental).
From elite driven to community based governance mechanisms for the delivery of public good from land management

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The current schemes (namely RDP) for the provision of environmental public goods or ecosystem services (EPG) are exposed to large criticism in the Czech Republic. Environmentalists point out that the schemes are perceived as a mandatory source of income while there is little interest in conservation on the side of farmers. Land operators often argue that global values are too abstract to follow while local opinions on what should be provided differ among stakeholders. Other critics/stakeholders emphasize lack of coordination, particularly, if land is out of the conservation areas. In the response to these issues, several non-governmental initiatives emerged in the Czech Republic in the recent years with the aim to organise provision of public goods or ecosystem services on more consensual base. These non-governmental schemes are usually initiated by activists as foundations or trust funds, nevertheless often presenting themselves as representatives of communal interests. The objective of the paper is to present four cases of such efforts and show their common and contrasting features in the light of their possible integration in the future RDP framework. In particular, focus is put on the community based character of these initiatives for the management of natural resources. The research is conceptually based on Ostrom’s work on collective action. The resources in the focus of these initiatives are regarded as commons rather than as pure public goods. We primarily concentrate on the examination of the (narrow) eight conditions for governing commons (Ostrom, 1990). Later, some aspects of the broader concept of socio ecological systems (SES, Ostrom, Cox, 2010) are examined in the case studies too. In the next step, we concentrate on the possible improvement of the current governance mechanism. We deploy stakeholder knowledge and in participatory way propose alternative solutions for conflicting issues or incomplete setting of rules. In this part, we adopted fuzzy (logic) cognitive mapping and modelling (Gray et al., 2012). The case studies we selected in the two recent H2020 projects on the provision of public goods from agriculture and forestry (PROVIDE and PEGASUS). They represent a broad range of social, economic and ecological configurations as well as various levels of the development of the collective governance mechanism. The research showed that the Czech non-governmental initiatives are exposed to more complex setting of property rights (PR) than they thought when established themselves and buying out land does not prevent them from the need for compromising with the holders of some of the attributes of PR. Actually, it shows that some of those who are affected by the decisions are not included in the initiative and thus deprived from affecting in decisions. The effort of the initiatives to change the regime in the SES, however, stimulates fear among stakeholders about the future consequences for the socio-economic system. More has to be done to integrate local stakeholders in the initiatives turning them from elite driven in community based ones. In two cases, stakeholders opted for an integration of their initiative with the local LEADER LAG. The fact that such initiatives emerged and function, supports the view that collective actions might be a realistic governance mechanism for the provision of public goods from agriculture and forestry.
SESSION 1B

Sustainable short food supply chains

Room: SOCRATES

Chair: Majewski Edward
Consumers’ Preference Towards short food supply chains. An analysis applied to honey in Mar del Plata – Argentina

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This study analyses the consumers’ attitude towards short food supply chains in honey market in Mar del Plata – Argentina. Consumer’s preferences were analyzed using a non-hypothetical choice experiment and a sensory hedonic evaluation for four types of honey with different textures and geographical origin. Consumer’s opinions toward the short supply chain were analyzed by using different statements obtained from the literature and measured by a Likert scale. An Exploratory Principal Component analysis (EPCA) and a Confirmatory analysis one (CPCA) were carried out and related to consumers’ Willingness to Pay (WTP) for the different honey products. Preliminary results showed high preferences for short chain when the sensory experience is positive.
Tendencies in development of modern short food supply chains in Poland - a case of two bottom-up networks

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The aim of the paper is to characterize the process of formation of new local food systems in Poland. First we use Eurostat and Polish mass statistics data to analyse the changes in the local infrastructure devoted to direct sales of products, with special attention to sales of food. The analysis of the latter category of direct sales help to assess the possible market niche that could be easily adopted for development of the basic form of short food supply chain which is direct sales of agricultural products by small and medium farmers in Poland. Study shows that despite the fluctuations in the number of sellers at local marketplaces, the importance of food sales companies is growing, as evidenced by the growing share of agri-food turnover in total sales. Second, we present changes in bottom-up initiatives for the organization of distribution of agricultural production under the short supply chains. It has been undertaken to examine the structure of entities participating in sales initiatives of various types, barriers to functioning and development opportunities. A detailed study covered two purchasing networks operating in Poland. Surveys were also prepared for agricultural producers participating in these networks. For comparative purposes, materials and results of similar studies in other countries were collected. The organization of two sales initiatives within short supply chains was analyzed. The first of them, with a regional range, consists of small agricultural producers, and sells online. The second, consisting of small-scale agricultural producers, uses in its activity an advanced logistics system based on a web portal, transhipment warehouses and a network of local distributors. The survey covered farmers supplying agricultural products under one of the aforementioned purchase groups. The study showed that nearly two-thirds of farmers in the network obtained income greater 20 to 40% than in traditional forms of sale. Every fifth of respondents, thanks to joining the network, developed their activity by increasing sales by over 60%. The maintenance and development of the organic and traditional food sales platform depends both on correct economic relations, but above all on social relations between suppliers and consumers. An in-depth analysis of the cases of organized sales networks allowed to show the relationship between the nature of the network and its development possibilities. The nationwide network acquired venture capital funds for the development of its operations, which allowed for a further increase in the range and number of participants in the sales platform, both producers and consumers. However, in the structure of sellers through this network, the share of agricultural producers in relation to food processors is small. The study established that in the case of a regional network, which brings together only farmers, its further development is difficult due to logistic barriers. Local food systems and sales within short supply chains create the possibility of obtaining higher margins, which is important especially for small producers.
Do sustainability goals impact vertical relations? A content analysis of the European Food sector GRI reports

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The threats that economic growth is posing to the environment are now clearer than ever. Single consumers have a great deal of power in steering the trend of markets towards greener alternatives. Though, they need adequate information by the other actors in the market, i.e., by producers. CSR has become one of the main strategic activities of food firms. Reliable and comparable Corporate Social Responsibility (CSR) reports can constitute a valid source of information on companies’ conduct allowing better informed choices by the market. Empirical research related to CSR has mostly explored the relationships between corporate social performance and competitiveness, the incentives that firms have to adopt CSR standards, and the financial consequences related to the implementation of such rules, not its effects on vertical relations. We consider CSR rules as institutions which may have an effect on the reorganization of vertical relationships. We refer to Transaction Cost Economics (Williamson, 1985) as framework of analysis and we investigate in which way transaction costs and transaction attributes associated to CSR activities have a role in the reorganization of vertical relationships within food supply chains. The analysis is based on Global Reporting Initiative (GRI) sustainability reports by European agro-food firms. All GRI reports released after 2010 written in English and Italian were selected as final sample of 53 reports. The research method adopted is based on content analysis techniques applied to reporting activities. Reports were analysed in detail to evaluate the level of disclosed performance of the firms on a set of supply chain vertical coordination and economic indicators. This allows to transform qualitative data in a quasi-quantitative data that may be compared and analysed quantitatively. Data on the change in the level of coordination of the firm with its suppliers on environmental sustainability issues (dependent variable) was collected together with data on asset specificity, information costs; and monitoring costs (related to environmental impact control, stakeholder feedback, and audits). Other indicators are: firm size, firm public/private status, geographical location and GRI reporting experience. Given the ordinal nature of the dependent variables, data were analysed by means of ordinal regression models. Our results suggest that all the transaction cost economic variables included in our conceptual framework are relevant in variating coordination among supply chain partners. More specifically, we find that variables affecting chain coordination due to collaboration on environmental matters relate to: the presence of sourcing standards; effort in discussing with chain partners on ways to prevent and manage chain environmental impacts; and costs related to stakeholder feedback collection. What emerges from our analysis is that CSR can become an alternative governance form for food chains that may integrate public regulation for environmental matters. Indeed, it favors transparency, efficiency and environmental performance via self-regulation. These factors can also potentially strengthen chain relationships and a more efficient management of vertical relations that may improve performance and allow differentiation opportunities in the market.
Valorising local dairy products and territorial development through the improvement of the value chain in Tunisia

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In the Tunisian dairy sector, the development of value chains is strategic considering the strong interrelationships between its various actors, and also for its economic importance (11% of agricultural production value), its social role (30% of farmers, 80% of them are small size) and its degree of industrialization (72% of the transformed products). In spite of the deployed efforts and the results obtained in terms of production, this sector still suffers of several problems which have negative effects on the various links of the sector, mainly the equity in sharing of the added value. The objective of this article is to emphasize the ineffectiveness in the chain and to identify the factors which add costs. It also proposes corrective actions and ways of adjusting the unbalance between the actors. This study is based on an analysis which shows the responsibilities, prices and margins throughout the value chain and between the various phases of production (Breeding, collection, processing and distribution). Data used in this study was taken from national surveys (2016-2017) of all the actors distributed in four principal dairy regions in Tunisia and classified according to their size, organization (large State owned farms, cooperatives, small size farms, private companies). The results obtained showed that the added value remains very low and its benefit-sharing between the actors is unbalanced. A redistribution of the margins is in disfavour especially of breeders, collecting centres and transporters. It also reveals that the benefits obtained are in favour of the actors which are in the downstream of the sector: wholesalers, large dairy plants and transformers, who impose their buying terms. Today, it becomes necessary to set up short value chains at the level of the small operators distributed throughout the territory. The development of these chains value should encourage traditional good practices and knowledge of farmers in order to enhance the local dairy products for each region. At an institutional level, it becomes urgent to reconsider price policies through a liberalization program in the sector, by adopting quality pricing policies and implementing a strict observance of quality standards. Keywords: value chain, dairy, governance, Tunisia
Quantitative Approach to Sustainability of Short Food Supply Chains

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There is an on-going scientific and policy debate how to utilize the local food systems and Short Food Supply Chains (SFSC) in order to provide beneficial solutions to the society and rural areas. Producers that participate in these systems are supposed to gain a higher share of the value added and contribute to the development of local territories. It is believed, that local food systems and shortened food supply chains provide also benefits to the natural environment, e.g. via lower food miles and carbon footprints. However, to date, very little empirical evidence exists on the quantitative impact of varied types of food supply chains. Given the shortcomings in the literature this presentation focuses on the quantitative assessment of economic, environmental and social sustainability of selected Short Food Supply Chains. The evaluation of an impact of SFSC draws upon a set of indicators developed within the Strength2Food project. In practical terms, the results for short chains are evaluated in comparison to mainstream food retailing alternatives. This contribution presents the first preliminary results of case studies conducted in Poland, France and Hungary. A variety of products were investigated to explore and compare diverse value chains (6 types of short channels and 4 types of long chains). In particular both fresh products (organic grains, strawberries, apples, vegetables and free-range eggs) and processed products (cheese, smoked plum, meats) were included in the analysis. Data were collected at the farm level, via farm surveys and supported with secondary data from the retail sector. Our results confirm that farmers usually participate in more than one chain, diversifying distribution channels. Some farmers participate both in short and long channels. In economic terms, (price premium, added value) SFSCs are found to be more beneficial for farmers, while it seems that „long supply” channels generate less negative environmental impacts per unit of production measured by carbon footprint. Our findings also suggest that farmers participating in SFSC perceive a greater bargaining power in comparison to their counterparts involved in longer market chains.
SESSION 1C

Provision of eco-system services through agriculture

Room: DEMOCRITUS

Chair: Nuppenau Ernst
Agricultural production faces versatile and often conflicting expectations. These include, for example, considerations related to the production of various ecosystem services such as food, pollination, landscape, climate services. The policymakers should be able to integrate these different expectations into an acceptable agri-environmental policy. However, this is more and more difficult in the future because in Finland, as in many other European countries, the public sector suffers from a sustainability gap. This study, explores and provides tools to integrate citizens’ and farmers’ preferences and values related to agricultural production into the design of agri-environmental policies in order to obtain more environmental benefits with lower cost for the national economy. One solution to these challenges would be results oriented policy based on citizen and farmers values and preferences. To facilitate discussion about result oriented agri-environmental policy, we study both the demand and supply side of ecosystem services from agricultural lands. Using the discrete choice experiment (CE) method, we first measure citizens’ willingness to pay (WTP) for four different ecosystem services from agricultural environments. Second, we analyse farmers compensation request (WTA) for producing the same four services. The estimates were aggregated to reveal the policy priorities for future agri-environmental policies. The results show that farmer’s compensation request exceeds the citizen willingness to pay almost in all attributes and levels. Citizen’s WTP emphasizes the importance of biodiversity and water quality, the attributes that gathered highest compensati on demand from farmers’ side. As agri-environmental policies direct ecosystem service provision strongly, there is an incentive to re-design policies to better respond to the gap between the demand and supply of different ecosystem services. Our results showed that citizen WTP does not cover the compensation need and is not enough to achieve the level of ESS preferred by citizens. However, significant uncertainties related to results based policy and information requirements for farmers need to be solved before changing policy regime. The results of this study can also be useful in developing the current policy scheme of cost based compensations by focusing on the most demanded ecosystem services. Measure based compensation, however, may not lead to most efficient outcome in terms of overall supply of desired ecosystem services. In this sense, payments based on observed and measured environmental benefits are more likely to lead improved cost-effectiveness and efficiency. However, the implementation of result oriented policy scheme would require fundamental shift in policy structures.
Enhancing Ecosystem Services through peri-urban agriculture management: the case of the agricultural park of Casal del Marmo (Rome)

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The increasing concerns about sustainability of human actions has taken as a result the integration of sustainable management of food systems within the global development goals. In the light of the growing urban population and the connected pressures on agricultural lands and management of natural resources, food systems’ sustainability is a paramount goal, as expressed in several international declarations and programs (UN Sustainable Development Goals, UN New Urban Agenda, HLPE). At the same time, the Ecosystem Services approach has demonstrated that an evaluation of the benefits and costs provided by food systems is necessary to address efforts through a sustainable management of natural resources. Particularly, in the case of natural and semi-natural areas, the evaluation of ES provides an estimation of the bio-physical and economics values provided by different kind of agriculture. In order to transfer the theoretical approach to practice solutions, it has been chosen a particularly interesting agricultural area in the municipality of Rome: the agricultural park of Casal del Marmo (Parco Agricolo Casal del Marmo). It presents particular characteristics in terms of urban resilience: not only does it offer, in itself, elements of natural, agricultural, landscape and historical-archaeological interest but, having been incorporated by urban sprawl, is a paradigmatic case of urban agriculture capable to respond to a range of functions – Ecosystem Services - ranging from the provision of proximity food to recreational and cultural services. In this area, strongly urbanized and subjected to social and environmental pressures, the demand for ecosystem services can be answered in the correct management of the potential offered by the agricultural and food system in its many forms: direct sale of agricultural products, sustainable agriculture, accessibility to green areas, environmental requalification, social agriculture, urban gardens, etc. It has been possible to outline a qualitative accounting in terms of variation of ecosystem services linked to different types of agriculture: while a type of extensive agriculture provides a given value of goods intended as agricultural products for human consumption and a given amount of ecosystem services linked, for example, to carbon sequestration or biodiversity, a different type of intensive farming provides a greater supply of food but a lower supply of the other two environmental services considered. If it has been considered also the other two categories of ES (Supporting Services; Cultural Services), the overall evaluation becomes very useful in providing keys for the better management of urban and peri-urban agricultural areas and the understanding of trade-offs between different scenarios. Including this type of reasoning within environmental policies - but also urban and territorial - could be a first approach to take into account the full range of Ecosystem Services that different land uses improve or, on the contrary, reduce. We can therefore state that, in a peri-urban area such as the one studied, the coexistence of different types of agricultural systems makes it possible to design the food system as a key theme around which to enhance the Ecosystem Services offered.
Multifunctionality and ecosystem services in fisheries

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Multifunctionality is characterized by two key elements: the existence of jointly produced multiple commodity and non-commodity outputs (NCOs), and that NCOs exhibit the characteristics of public goods externalities. The term “multifunctionality” is almost not used outside agriculture. However, several issues discussed in fishery literature and in international fishery contexts clearly refer to public goods provision and joint production. The key point is to recognize if fisheries, similar to agriculture, provide other (public) benefits beyond their primary food supply function. The work establishes a theoretical framework for the classification and valuation of multifunctionality in fisheries, and outlines policy options to increase (through multifunctionality) social welfare. NCOs may include several aspects (e.g. cultural heritage and coastal viability, coastal employment externalities, food security): among them ecosystem services and environmental externalities are probably the more relevant. Similarly to agriculture, fisheries concern the management of natural resources, but the two also have important distinctive aspects. First, while plants are planted and breeding decisions have a major influence on farm animals, fishers only affect the size of fish stocks directly through adjustments of the harvest quantity. Second, while farming land is tied to a single enterprise, fisheries are typically managed as a common-property resource. Finally, farmers, through land property rights, have the possibility (in some cases, the obligation) to manage elements of the environment, landscape, and biodiversity structure that affect the well-being of other individuals. In fisheries, property rights, when they exist, are more strictly linked to a specific resource (i.e., individual quotas for commercial stocks), while the rights (and duties) on the surrounding environment are poorly defined. Regarding agricultural products, countries are often concerned that reductions in production-linked support and trade liberalization may, through a decline in food production, reduce some of the NCOs jointly produced with food. For fisheries, this argument seems more difficult to justify. In fact, fishery subsidies cause overcapitalization of fleets, overexploitation of fish stocks, and loss of resource rents. However, we will show a few case where fishers seems to have rights on the marine environment and, as a consequence, on ecosystem services. This would justify the inclusion of ecosystem services in the list of benefits that fishers provide through their multifunctional activity. For our theoretical framework, the main NCO characteristics to be analyzed are the degree of jointness between commodity outputs and NCOs, and the distribution of property rights over fish stocks and NCOs. Policy options to increase social welfare include, among others, command and control schemes, marked based instruments (e.g., payment for ecosystem services), and marine protected areas. Customary marine tenure institutions, or other modern fishery organizations, may represent a framework for the communitarian provision of NCOs. Fishery subsidies, which typically cause overfishing, are justified if they allow increasing social benefits, given by the sum of catch and NCOs value. Particularly, incentives may be necessary to support small-scale fisheries or other less efficient technologies.
Value Generation from Bio-Diversity as Public Good: Searching for a New Institutional Paradigm in Agrarian Value Chain Management

Nuppenau Ernst, Justus-Liebig-University Giessen, Dep. of Agecon

Eco-system service (ESS) provision and evaluation of nature (biodiversity BD) is an important prerequisite for the design of agricultural policies. Yet, there is a problem with market failure. Nature conservation and evaluation can be characterized as public good problem, nature being non-rival and non-exclusive. Largely due to public pressure, nature planning has received increased attention, also as mean to create value especially in agro-environmental projects. Governments seek to promote BD and landscape provision by farmers and try to obtain financial support from consumers and the public. But, planners frequently do not know what the public wants and contingent evaluation results are often regarded as insufficient. There is scope for a more workable coordination process (institutional innovation) between interests in environmental projects (being oriented at BD and corresponding ESS) and willingness to pay WTP at regional scale. In that process interest groups shall gain insight into needs to preserve nature, nature's complexity; but we have countervailing interests of participants. Proponents of market oriented preference revelation (WTP) are confident that all groups can express their concern. Opponents stress, that power of interest groups may play a major role in preference formation. As political economy theory suggests, bargaining in conflicts is not free of social power. Against that background it will be shown that an application of a political economy model which recognizes the public good character and uniqueness of BD helps to understand the formation of preferences from WTP gained from value chains. In the paper we primarily provide a theoretical framework drawing on institutional economics for derivation of preferences and interest. The approach adopts a predatory versus productive government framework of Raussier and Zusman and taxing of higher valued goods containing eco-system services. These goods are marketed through special value chains and companies help to finance public management of ESS. It distinguishes the process of public preference formation from those of individual formation and recognizes the concept of social power. (1) An introduction to preference detection highlights the need for a public good approach. (2) Interest group preferences are modeled. (3) A manager will be entitled to charge fees to beneficiaries and guarantee compensations. (4) Bargaining for BD representing ESS is outlined.
SESSION 1D

Sustainability of food system procurement

Room: THEOFRASTUS

Chair: Tregear Angela
Consumers’ knowledge, confidence and valuation of Food Quality Schemes: A qualitative approach to the understanding of food sustainability through food practices in 40 European households

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Both European agricultural policy programmes and participant observations of everyday food practices confirm that “preserving the ecosystem and securing sustainability” (as named in the call) is a central issue for European citizens. This exploratory paper approaches the concept of ‘sustainability’ through the analysis of everyday practices of food consumption, by using Food Quality Schemes as an implicit way to understand how people perceive and understand food quality and its sustainability. The research is part of an on-going EU-funded project “Strength2Food” that aims to enhance sustainability of agri-food chains and food quality schemes. This paper specifically focuses on food quality labels, including protected designations of origin (PDOs), protected geographical indications (PGIs), organic food as well as food purchased in short food chains (e.g. farmers’ markets, box schemes, solidarity purchasing groups, etc.). The aim is to better understand consumers’ valuation of food sustainability through an in-depth qualitative analysis of households’ food practices and their perceptions towards food quality labels. This research methodology was based on ethnographic fieldwork (2017-2018) among 40 European families requiring visits in 5 to 6 households in each of the seven participating European countries (France, Germany, Hungary, Italy, Norway, Serbia and UK) during three seasons. This study presents a first assessment of consumers’ knowledge, confidence and valuation of the sustainability dimension promoted via food quality labels, as well as propositions for a better regulation of sustainable food. Although most informants were aware of consuming local and sustainable foods, following the researchers’ definition of sustainability, neither the FQS not the concept of sustainability itself were really at the core in the dialogues and observations, findings which give an interesting possibility for further reflections. The ethnographic fieldwork for this study was initially used in anthropology and sociology. Ethnography is gaining increasing popularity in consumer science, not only to understand consumers’ motivations and barriers, but also to build more targeted communication strategies. Convention theory social practices theory is-the main theoretical framework for our understanding of sustainability within food consumption.

Acknowledgment: This paper is based on the Strength2food project that has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 678024.
Short food supply chains (SFSCs) and sustainable food system development. Stakeholders’ motivations for participation and their perceptions of drivers and barriers for development. Results from 12 European cases studies

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Short food supply chains (SFSCs) are often viewed as sustainable alternatives to “long” conventional food chains along economic-, environmental and social dimensions (Galli and Brunori, 2013), and may broadly be defined as a “supply chain involving a limited number of economic operators, committed to cooperation, local economic development, and close geographical and social relations between producers, processors and consumers” (EIP-AGRI, 2015). SFSCs entail a whole range of distribution channels such as markets (outdoor/covered), speciality shops, purchasing groups, box schemes, farm shops, internet sales, community-supported agriculture, food fairs etc. Increasing political and academic interest in SFSCs has resulted in a range of different studies on actors’ motivations as well as discussions of drivers and barriers for SFSC development (see e.g., Galli and Brunori, 2013 and, Kneafsey et al., 2013). However, fewer studies include the whole value chain (producers, retailers and consumers), and there is still lack of cross-national studies of context-related framework conditions. In this paper we draw on results from an ongoing study as part of the Horizon 2020 Strength2Food project. The research includes studies of 12 SFSC-cases in 6 European countries: France, Hungary, Italy, Norway, Poland and UK. We applied a case study design with a mixed method approach involving both qualitative in-depth interviews with stakeholders (producers, retailers, consumers) and surveys of customers. The selected SFSCs include cases with direct sales from producer to consumer and cases with one (or more) intermediary. The cases also cover traditional food distribution such as outdoor markets and speciality shops as well as new initiatives such as solidarity purchasing groups and box schemes. Cases of agricultural-, aquaculture- and seafood products are included in the study. The paper will discuss actors’ motivations for participation as well as their perceptions of drivers and barriers for SFSC development. What main differences and similarities between types of actors and cases do we find? These questions will be discussed in the light of policy objectives and public discourses on opportunities for sustainable development of local short food supply systems.
SESSION 1D

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under the grant agreement No 678024.
Targeted mechanisms for sustainability in agricultural and forestry production – results of the H2020 project PROVIDE

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Mäntymaa Erkki, Natural Resources Institute Finland (Luke)
Due to market developments and technological innovation, European land use has shifted towards more intensive forms in the last decades. In competitive and ‘favoured’ regions, this shift has led to productivity gains. In contrast, in areas with less favourable conditions, marginalisation and land-abandonment takes place. Both developments influence the provision of public goods (PG) and ecosystem services (ESS) from agriculture and forestry and induce (often negative) changes in e.g. soil functionality, biodiversity, water quality and availability, or rural vitality. Most land management in Europe is performed by farmers and foresters, whose management decisions are driven by the aim to supply food and raw materials to the markets. In contrast, due to their PG character there are no/few markets for environmental ESS. Consequently the provision of environmental ESS is usually not the first objective on the land managers’ agenda and therefore often not in line with the societal demand for these goods - despite the enactment and implementation of a variety of European policies aiming at sustainable agricultural land use. Our contribution to the EAAE Seminar presents a comprehensive study on the design and evaluation of governance mechanisms ‘beyond policy’, particularly including approaches of collaborative partnerships and incentives set within the agro-food value chain, for the balanced provision of PGs from agriculture and forestry. We use a set of 14 European case study regions (CSR), clustered into 4 types of context-driven mismatch situations between PG/ESS demand and supply, namely the insufficient provision of environmental PGs (i) in intensive agricultural areas, (ii) in low/medium intensive regions due to land abandonment (iii) in low intensive regions due to low awareness, and (iv) in forest landscapes. In order to develop governance mechanisms best targeted not only to the most relevant regional PG issues, but also to the PG providers and consumers, we make use of a structured stakeholder co-design process applied in all CSRs. This process includes: 1.) identification of regional hotspots of PG demand and supply, 2.) identification of failures in the current governance system/definition of criteria of good mechanisms, 3.) elaboration of new mechanisms, and 4.) analysis of enabling factors and barriers for the uptake of mechanisms. The efficiency and effectiveness of the mechanisms is assessed by a set of context-specific modelling approaches. They include fuzzy cognitive mapping, multi-criteria analysis, discrete choice modelling as well as a range of mathematical models. Modelling considers regional scenarios of socioeconomic as well as natural developments, including regional effects of climate change. Our results show that particularly in intensive agricultural regions, where production is clearly market-oriented, sustainability incentives by the agro-food value chain, as well as the installation of collaborative mechanisms, such as collaborative partnerships and collective incentives, represent potential mechanisms
for improved PG provision with clear advantages as regards effectiveness compared to classic policy instruments. Nevertheless, it also becomes clear that farmers’ trust in the agro-food chain represents an important obstacle as regards acceptability and that particularly in marginal regions, where production is mainly dependent on public payments, the influence of agro-food-based mechanism are limited.
The agricultural district of organic horticulture in Val di Gresta (Italy)

Marongiu Sonia, CREA PB

During 80s, the Italian agricultural economists started to elaborate the concept of agricultural and quality agro-food districts, extending the Marshall district definition to the agricultural context. The result of this contamination between the industrial and agricultural economists resulted initially in the definition of a well-defined framework where classify the different typologies of districts, on the basis of the general rules applied in the industrial context. In particular, this theoretical framework defined the characteristics of the agricultural, agro-food and rural district and, following these indications, different districts have been identified and described in many Italian regions. The enactment of a National law in 2001, even if not perfectly aligned with the theoretical framework, strengthened the importance of the district’s concept, giving to the Regions the competence to recognize and develop them. But the different interpretation and implementation of the law at Regional level has resulted in a not organic framework. In particular, the basic rules applied to recognize the districts appeared not coherent with the theoretical framework developed in the literature. In some case there is not a strong relationship of the activities with the specific local context, in other cases there is not a clear delimitation of the activities carried out in the district or the link of products with the historical development of the area is missed. This work is a contribution to this field of analysis and describe the interesting case of Gresta Valley, a well-defined area in Trentino, where horticulture is the most important activity since more than 40 years and where it is possible to recognize the typical characteristics of the entity called “district”. Gresta Valley is located in the south-western part of Trentino, between the Adige Valley and Sarca Valley and not far from the Garda Lake. Even if in mountain, this position gives to this valley a particular climatic conditions, favourable for the development of organic horticulture together with other activities (fruit and grapes cultivations, berries, medical plants). This productive context presents other interesting aspects. On the organizational point of view, the average surface of the farms is very low and this has forced the farmers to cooperate in order to reach market in a easiest way. Moreover, the difficulties to practice agriculture in mountainous area has modify the landscape, characterized by the presence of terraces. The presence of many sites belonging to Natura 2000 increases the environmental importance of this valley. Horticulture is practiced in this areas since a long time considering that the first Consortium was born at the beginning of 70s. Following the suggestion of the Autonomous Province of Trento, in 2013-2014 a group of local actors and stakeholders have established a Committee that, after a long process of bottom-up participation, has prepared a document to make effective the definition of an organic agricultural district in Gresta Valley. The district cover a surface of 30 kmq and include three Municipalities (Isera, Mori, and Renzo-Chienes). The Utilized Agricultural Area is about 900 ha, of which one half is managed as organic agriculture. The most important objectives of the District are to valorize the specificity of the whole territory, to develop synergies between agriculture and tourisms, to valorize and cultivate the abandoned lands and to maintaining the terraces as an important component of the territorial landscape. Until now the District has already carried out different activities of dissemination, training and promotion of organic agriculture.

This analysis will be included as a case study in the Horizon 2020 project Strenght2Food (Strengthening European Food Chain Sustainability by Quality and Procurement Policy).
The sustainability of alternative models of public sector food procurement: evidence from two school meals supply chains in the UK

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In recent years, much policy attention has been paid to the role public sector institutions can play in promoting more sustainable food chains. For example, provisions in EU Directive 2014/24 encourage procurement practices that may contribute positively to sustainability goals, such as the sourcing of more local produce. Although many sustainability analyses have been conducted of food chains in a commercial and retail food context, including chains that adopt localised models, studies in the public sector are comparatively few, particularly those that seek to measure quantitatively the sustainability impacts of different types of procurement model. The aim of the current study is to address this gap, by (i) developing a method of measuring the environmental impacts of public sector food procurement chains and (ii) applying this method to the primary school meals services operated in two UK local authority areas. Following a contrasting case study methodology, the first meals service is operated by a local authority with well-established, ambitious sustainability targets including the procurement of foods from local suppliers and growers, whilst in the second meals service, the local authority places a strong emphasis on low cost and procures fewer items from local suppliers and growers. Results reveal the total carbon emissions associated with supplying food to selected schools in both services over one school year, as well as the relative contributions of key transformation stages to the total in each case (i.e. production/processing; transportation; cooking and waste). Further ‘what if’ analyses explore the impact on carbon emissions of practical alterations to the services, such as adjusting the amount and types of meat in the school menus, increasing or reducing the services' dependence on local suppliers, and/or improving the coordination of transport between the suppliers in each case. Whilst still at an early stage of development, it is proposed that the quantitative measurement method applied here may be a useful addition to the toolkit of public procurers seeking to enhance their sustainability outcomes.

The research was funded under H2020 grant agreement 678024 ("Strength2Food").
SESSION 1E

Consumer preferences towards animal products

Room: ARISTOTLE

Chair: Afrini Filippo
When Communication Aims Fail - The Dilemma of Endangered Livestock Breeds

Menger Katharina, Universität Kassel
Hamm Ulrich, Universität Kassel

In 2015 the FAO published “The second report on the state of the world’s animal genetic resources for food and agriculture” drawing a bleak outlook on local livestock breeds. Especially in the industrialized North, many native breeds are on the verge of extinction. In Germany, 41 of the 48 identified domestic breeds (cattle, sheep, goat and pig) are considered to be endangered. Despite the fact that these native breeds are perfectly adapted to their local environments and possess rich genetic resources, the FAO as well as researchers worldwide agree that the loss of this genetic diversity could lead to unpredictable problems and challenges especially considering climate change and feed adaptation as well as disease resilience. Further, researchers agree that preserving endangered livestock breeds (hereafter ELB) needs to be done on farm level in order to be sustainable. However, farmers have replaced ELB with highly productive breeds because ELB are not as productive as “modern type” breeds. Therefore, political assistance as well as market demand is necessary to preserve ELB. While there are some studies on political assistance, only few researchers conducted market demand studies. Thus, little is known on consumer attitudes towards the topic of ELB. To overcome this lack of knowledge an explorative study was conducted in April 2017 in Germany, asking 32 meat eaters how they understand and consider the problem of ELB and whether they would purchase meat products from these breeds. The method of thinking aloud protocols was chosen as this method allows interviewees to freely share their beliefs, emotions, understandings and comments while for instance reading a brochure about ELB. During the interview, all participants were presented with six brochures from different editors (including two farms, two retail stores, a butcher’s shop and a breed association) and asked to read aloud and think aloud. Subsequently, all interviews were transcribed and analysed using qualitative content analysis. The following seven dimensions were established to group the different aspects mentioned by the interviewees and focus the analysis: agriculture, endangerment and conservation, taste and quality, purchasing behaviour and consumption, editor of the brochures and finally layout and design. Findings include that the interviewees had very different levels of knowledge regarding the topic of ELB. Interviewees with previous knowledge about ELB stated a willingness to buy and pay a price premium for ELB products to help preserve the breeds. Interviewees with no previous knowledge were not as easily convinced about the importance of ELB and presented a certain degree of reluctance considering the positive impact of their individual buying decision. More notable was the group of participants which was not able to comprehend the topic of ELB. Unable to differentiate between the conservation of a breed and the life of single animal, they argued that slaughtering and eating the animal could never preserve the breed. Some were even unable to differentiate between ELB and endangered wild animals concluding that one should not demand the products of any animal endangered. Several suggestions to overcome present communication challenges were derived.
Consumers’ willingness-to-pay for local feed in local animal products

Profeta Adriano, University of Kassel, Department of Agricultural and Food Marketing
Hamm Ulrich, University of Kassel, Department of Agricultural and Food Marketing

What is the definition of local food? For answering this question, past consumer research drew on distances between the point of production or processing and the point of purchase or political and landscape boundaries. In contrast, the question what consumers expect about the origin of input factors for locally labelled products were most often not considered. In Europe, most of the protein-rich feed components are imported from non-European countries and big parts of other feedstuffs do not come from the region in which animal production takes place. This holds in particular for the pork, poultry, and egg production hot spots in North-Western Germany and the Netherlands. Due to comparative disadvantages, the production of animal products with local feed is connected with higher costs. In this contribution, we analyze if the consumers are willing to pay a price premium for a locally labelled product in Germany, if in addition the local feed origin is displayed on the product package. In Germany, most animal products sold are not labelled with any information on the origin of the animal feed, so that there is no market data for such labelling. Therefore, we carried out a German wide consumer survey in Winter 2016/17. The willingness-to-pay (WTP) for a local feed origin was measured by a direct price question and a Discrete-Choice experiment as well. With both methods the WTPs for a local feed origin for eggs (6 pieces), milk (1l), pork cutlets (200g), and beef steaks (200g) were recorded. In this context, the WTP was not only calculated for the case of a 100% local feed origin, but also for lower local feed shares of 90% and 75%. The results from both methodical approaches reveal a high market potential for a product differentiation strategy in the area of local supply chains. For all products considered, the analysis revealed high consumer WTPs for animal products produced with local feed. We assume that all additional costs that come along with a local feed supply can be covered by the calculated WTPs. The findings also provide insights into consumer preferences for different shares of local feed in locally produced animal products. Due to the existing positive WTPs for a 75% and a 90% local feed share, economic comparisons with the corresponding production costs should be carried out for these levels as well in comparison to a 100% local feed share. An important motive to buy local food is to strengthen the local economy. Therefore, more emphasis should be laid on labelling local feed shares in local animal food products.
Agrofood of the middle, is this a innovative form of sustainable food systems?

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Scholars observe in Europe as in US the development of food systems acting jointly with commodity markets and local food chains (Bloom, Hinrich 2010). These innovative supply chains are able to develop a wide range of quality products and pull away their offer on bigger distance than short chains. They demonstrate an interesting capacity to create specific quality and to produce original standards associated to local references. In this paper we explore the nature of the arrangements between firms in several case studies chosen in the Auvergne-Rhône-Alpes region in France. Our framework cross the analytical grid of the institutional economics and of the geography of food systems. The general organisation of these systems is diverse and the variety of their strategies infers a collection of specific cases. Our research questions the ability of the stakeholders to manage innovative relations to anchor their systems in a sustainable and resilient trajectories.
Social Business Model Innovation based on the Quadruple/Quintuple Helix Innovation System Framework

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Social innovation is related to new products, services and models aiming to improve human well-being and create social relationships and collaborations. Social innovation is focused on the creation of new or the alteration of existing ways that give societal value, stimulating the societal and sustainable creation of new products, services, methods and strategies. The important role of the social capital is emphasized in several studies mainly because it shows the social relations within a community or an organization and takes into account not only the individual but also the economic, cultural and symbolic dimensions, given its main characteristics: networks, norms, and trust. The fact that there should be more radically open systems rather than systems with organizational constraints, has led to the emergence of social innovation, a way that can solve different problems through transparency. Through social innovation new social relations can occur, societal as well as sustainability challenges can be addressed, while the cross-boundary competence can be strengthen, the traditional silos within and between academia, public and private organizations can be broken down and all these will democratize the production and application of knowledge for social development. This study examines how the BMI context can foster social innovation and can be applied in social innovation projects and initiatives. The social mission as a part of value proposition is the most important characteristic of social BMI, while the value creation is done through the key partnerships with governments, alliances, companies, foundations, communities as well as through funds, strategies, initiatives, standards. On the other hand, value communication may take very different forms (e.g., competitions, challenges, initiatives, projects, roadmaps, thematic platforms and programmes), however the participation of different stakeholders is critical. What is important for social BMI is the social mission, which needs to be defined in order to be able to move forward with the strategy, the value proposition, and the best practices of the business. As a result, social business models aim to provide the development of both social and economic value for the social purpose business which in return will help it to have an impact on society as well as to gain profit. Moreover, the ‘ecosystem’ approach provides an integrated framework for social business models. In this context, the Quadruple/Quintuple Helix Innovation System Framework may represent and study the role, nature and dynamics of social co-opetitive fractal ecosystems, given emphasis on civil society, political structures, environment, and sustainability. The Quadruple / Quintuple Helix Innovation System Framework is an agglomeration of firms, institutions, and other stakeholders intertwined via a helical, dynamic, complex, non-linear, self-similar (fractal), and self-organizing higher-order learning architecture of a knowledge production system. In this context, the paper discusses how the Quadruple/Quintuple Helix Innovation System Framework may promote social innovation, offering a sustainable development perspective that brings together innovation, entrepreneurship, and democracy.
Asymmetric Price Transmission in Egg Price in Retail Market in Iran

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Agricultural production price analysis is economically and politically important. One of the most important factors affecting the welfare of producers, marketing factors and consumers of a product is price transmission of products. Asymmetric price transmission has been the subject of considerable attention in agricultural economics. It is not only important because it may point to gaps in economic theory, but also because its presence is often considered for policy purposes to be evidence of market failure (Meyer et al. 2004). The analysis of asymmetries in the price-transmission mechanism at different levels of the marketing chain provides a good indicator of market efficiency in vertically related markets (Ben-Kaabia et al. 2005). In Iran, the amount of poultry production, as one of the sub sectors of the agricultural sector, is strongly influenced by changing in the price of inputs in this sub-section. It means that an increase or decrease in the price of an input can affect the reduction or increase in the level of production of this sector. In poultry sector, egg as one of the protein food stuff plays an important role in supplying food needs and meals of Iranian households. Although the number of producers of this product in the country is high, in recent years, high prices of egg has caused dissatisfaction of consumers. However, producer didn’t receive a lot of share of retail price. So, the objective of this paper is to investigate the asymmetric in the price-transmission mechanism between input prices (corn) to output prices (egg) in Iran retail market. For this aim monthly price of egg and corn (as one of the most important inputs for feeding laying poultry) during 2005-2017 under a Threshold Vector Error Correction Model (TVECM) has used. Expected results indicate that, in the long run, price transmission is perfect and any price shocks on corn price, fully transmitted to egg price. In the short run, price adjustments between the corn and egg asymmetric and are representative of a cost-push transmission mechanism. In this case, policy maker should implement input and output price policies to support producer and consumer in retail market and increase consumer and producer welfare. Keywords: Asymmetries, Price Transmission, Threshold Vector Error Correction Model (TVECM), Poultry, Iran.
SESSION 2A

The role of quality labels in EU

Room: PYTHAGORAS

Chair: Tsakiridou Efthimia
The Perception of Food Quality Label. The Role of Information about Standards and Mental Shortcuts. Insights from Ethnographical Fieldwork

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The EU regulates the use of certain Food Quality Labels and provides a comprehensive set of standards that are linked to them. They developed food quality schemes for agricultural products that shall emphasize the quality and traditional character of food. A product labeled as PDO/PGI or TSG, according to REGULATION (EU) No 1308/2013, is closely linked to a specific geographical location and has passed an approval process. Moreover, the EU allows the designation “organic” exclusively for products which are produced according to the EU regulations for organic production. Beside the EU other institutions like retailers, farmers’ organizations or national governments developed standards that are represented by labels. Thus, there is a set of different labels that refers to different standards. Yet, some of the labels are different although they refer to the same standards, e.g. the organic labels of the EU, German government, and several German retailers. Over the past decades a large research stream has evolved analyzing Food Quality Labels. Only a few studies, however, investigated how they are perceived by consumers and how they are used in real shopping situations. Based on an ethnographical field study, that combines in-depth discussion and observational methods, this study contributes additional insights on that issue. The results indicate that the general idea of the EU labels for geographical indications is difficult to understand and that standards behind these labels might be irrelevant for consumers. Some participants did not notice these labels at all, even if they bought a marked product. Regarding the origin of products, the labels of German retailers as well as the official German label appeared to be more comprehensive. Moreover, findings show that labels can influence purchase decisions even if consumers have just a vague idea about their standards. This holds especially for organic labels and for the German labels referring to the region of origin. We found evidence that the feeling of “doing something good” plays an important role when buying organic or locally produced food. This feeling can be evoked by different labels even though the level of knowledge about the underlying standard is low. More information and knowledge about the standards is effortful to achieve and makes purchasing more complicated. It doesn’t seem to be knowledge about the standard but the need for a simple indicator that facilitates a purchase decision deemed to be the right one. In this context, labels are used as decision cues that help to make a fast and frugal decision in an environment of limited information and time constrains, in which additional information can make consumers uncertain. Thus, there is a tendency of not wanting to know the background/origin/standards of labels. Still there is a need of evaluating the labels even if they are used as simple cues. However, these evaluations are not inevitably based on knowledge about the underlying standards, but on a conglomerate of narratives and fragments of information from different sources like friends or the media.
Evaluating Socio-Economic Impacts of PDO on Rural Areas

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The European Agricultural Policy tries to achieve sustainable agriculture by paying appropriate subsidies. EU makes agri-food chains more competitive through the definition and promotion of food quality schemes. The main purpose of this policy is to assure consumers to access food with intrinsic qualitative attributes that are directly perceivable as credence attributes (Anania and Nistico, 2004; Grunert, 2005 and Nelson, 1970). The latter are identified in the origin of the products, in the production techniques that reflect the traditions and knowledge of a territory and refer to those foodstuffs that have the Designation of Origin (DO) as PDO and PGI. For these products consumers have a positive willingness to pay (WTP) that allows producers to gain a price premium. Therefore the quality index becomes an instrument for measuring food quality at different levels and also consist more economically convenient contents. However, the purpose of this policy is not only to gain greater competitiveness but is also an important tool for rural development, since most of the businesses involved are SMEs located in often disadvantaged rural areas. While there is empirical evidence of the competitiveness of products with a DO (London Economics, 2008 and Santini et al., 2013), their socio-economic impact at the territorial level is not yet fully evident. In particular, the generated effects on economic sectors related to the DOs are not clear. The objective of this research is to evaluate the socio-economic impacts of the DO on the rural areas indicated in the production regulations. The analysis is developed at NUTS 3 level for all PDO and PGI productions in Italy, France and Spain, joining the areas of origin and the socio-economic information included in the EUROSTAT data for the respective NUTS3 regions. Unfortunately the EUROSTAT data at NUTS3 level presents several missing information. This limitation is exceeded creating panel data which combines available information from the DOOR database with the integrated Cambridge Econometrics and Eurostat data for the period 1980 – 2015. Panel data, by blending the inter-individual differences and intra-individual dynamics have several advantages over cross-sectional or time-series data. More accurate inference of model parameters by increasing degrees of freedom and more sample variability than cross-sectional data. In addition, given the large dataset at our disposal, issues related to spatial correlation (e.g. spill-over effects) can be properly investigated. The study relates the presence of the DO with the following variables: population, employment (in agriculture, industry, construction, and not market service), GDP and GVA, and the respective labor productivity. According to the amount of data and the complexity of the dataset, the research is still in progress. The expected results would show the different level of socio-economic impacts in European rural areas considering the type of DO (PDO or PGI) and product classes. Moreover, will be observed the spillover effect given by the activation of other sectors.
linked to the DO. The aim is to proof the existence of socio-economic impacts due to the presence of Food Quality schemes.
The health-taste trade off in consumer decision making: Evidence from an experimental approach

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Understanding human eating perceptions and selection of food can highlight avenues for interventions by policy makers and the marketing industry. Along this goal, we explore whether expectations derived from the visual appearance of food, blind tasting and product information affect hedonic judgments for functional food products as well as willingness to pay (WTP) values. We also provide evidence on the degree to which consumers are willing to trade off taste in order to derive the potential health benefits of a healthy snack. Both research objectives are examined in the context of an experiment that elicits hedonic evaluations in a series of 2nd price Vickrey auctions for two different healthy snack products under blind tasting and informed conditions. The results show that blind tasting of healthy snacks has a negative effect on liking while provision of descriptive informational labeling is adequate in offsetting this negative effect for the carob-based snack and increase consumers’ WTP. In addition, the order of information and tasting plays a significant role in consumers’ overall food assessment since provision of information shortly before consumption, makes consumers less strict on their taste evaluations and increases purchase intent. Finally, the econometric results reveal that older respondents tend to bid higher for functional snacks.
Tourist Preferences for Quality Cues of Regional Products: The Case of Olive-oil in Crete

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Quality cues are assumed to drive consumer preferences and purchase intentions regarding food products. Recent research has suggested that intrinsic cues are more important than extrinsic cues for most utilitarian products. Yet, evidence suggests that this hypothesis may not be valid for regional products when consumers make decisions and act in relation to the consumption of tourism and, to a great extent, regional food products during their visit to a destination. Olive-oil, which is a regional product, is used for examining whether tourists value extrinsic vs. intrinsic cues as important. Using a sample of 1117 tourists in Crete, Greece, we show that tourists value both sets of quality cues as highly important. The disposable income, family size, and the source of information received by tourists exert an independent effect on their attitude formation. The use of quality of cues may be useful for food and tourist companies in creating niche markets and advancing rural localities at the tourism destinations.
SESSION 2B

Consumer preferences and sustainable food choices

Room: SOCRATES

Chair: Chrysochou Polymeros
The effects of the international events on the sustainability of food choices: a consumer survey.

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Recent literature is increasingly highlighting the role of individual behaviours for tackling global environmental challenges like climate change (Seyfang 2006; Mont and Plepys 2008; Spaargaren and Mol 2008; Grunert et al. 2014). Agriculture and food production are the second largest source of global GHG emissions (IPCC, 2014) thus there are interesting opportunities for mitigation among end-users (Maraseni et al., 2015). Even if lately more attention is being devoted to individual contributions, literature about climate change tends to under-research the behavioural dimensions of the problem (Pongiglione and Cherlet, 2015). There is a research gap on the drivers that may engage and move individuals into action. Specific events and declarations by opinion leaders may have a role in influencing citizen/consumer interest and in affecting their behaviour. 2015 was characterized by three major events that may have had an impact on consumer awareness about the environmental impacts of their everyday choices. This paper aims at evaluating if such events had an impact on consumer food choices. The events analyzed are: EXPO Milan 2015; Pope Francis’ encyclical ‘Laudato si’ - On Care For Our Common Home; the 21st Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change. All three events have had good media coverage and are, thus, quite well-known among the general public and not only among the most-expert or most-interested people. The research also highlights what types of consumers were influenced the most (or least) by the different events. Data were collected via in person interviews with a sample of 420 consumers in Milan. Collection was done in January 2016 (just a few months after the events took place) and in January 2017 (one year later) to evaluate if behavioral changes were maintained over time. Interviews were taken at 18 supermarkets, selected via systematic sampling with a random starting point. At stores, consumers were approached randomly. Data were analysed by means of ordinal regression models, since the dependent variables are measured on a 1-5 scale with an ordinal nature. We test two models for each dependent variable: change in food consumption following: EXPO Milan 2015, the ‘Laudato si’ encyclical, and the COP21. Results indicate that EXPO and COP21 were very well known, while the contents of the encyclical were known only by 30% of the sample. Nevertheless, EXPO is the event which produced the lowest (stated) impact on changes in food consumption; the COP21 was instead the most effective event. The segments of the population that seem to have been more affected are those who were less concerned and aware of the discussion about environmental issues and climate change before the media events took place. Thus, suggesting that statements from opinion leaders, to whom people look up to, and discussions at the international level with strong media coverage may be useful for engaging consumers that are not already concerned, aware and proactive on the matter, which is indeed the target of well-aimed policies.
The Acceptance of Guests for Sustainable Changes in Catering: Differences in Food Choice Preferences, Lunchtime Habits and Sustainable Attitude

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Langen Nina, Technische Universität Berlin - Education for Sustainable Nutrition and Food Science

Food consumption away from home is gaining increasing relevance among European consumers and therefore also provides a relevant field for the establishment of more sustainable food practices. Whereas a regular intake of highly value added meals away from home has been related to less healthy and less sustainable food intake, specifically the visit of company canteens has been identified as a potential driver of beneficial nutrition among employees. A considerable number of studies could demonstrate that various changes in the menu and service design of canteens can significantly improve the sustainability of meals i.e. by improving the healthiness of consumed meals or by decreasing food waste. Naturally, these studies also have addressed whether changes in the menu and service system are well-accepted by guests, i.e. by controlling for sales numbers or by conducting surveys among guests. However, at the earlier decision stage about different intervention strategies for an improved sustainability of canteens, only few studies have considered the opinion of guests. Moreover, most intervention-type studies only included general demographic and intervention-specific individual criteria (i.e. nutritional knowledge in the analysis of nutrition logo interventions) to differentiate between the reaction of guests to interventions. The present study aims to complement existing research by analyzing how employees at three public service locations evaluate seven potential food service changes at their local canteen, targeting at more sustainable food practices: pre-ordering of lunch either (1) for a full week or (2) for the next day, (3) paying exclusively with a personalized credit card, (4) weight-based billing for all dishes, (5) offering two portion sizes of each dish, (6) offering coffee only in reusable cups and (7) introducing one "veggie-day" per week. Moreover, we consider how the acceptance of these changed interacts with personal food choice preferences (based on the Food Choice Questionnaire), general attitude about sustainable consumption (based on the GREEN Scale) and lunchtime habits (based on answers about how employees would spend their lunchtime in 14 scenarios). Based on their answers in an online survey, 365 respondents are clustered into four food choice preference and four lunchtime habit clusters. Moreover, answers to the GREEN scale are summarized in a one-dimensional factor. Regression results on the acceptance of the different changes imply that the mean acceptance of interventions strongly differs (i.e. pre-ordering is less accepted than the use of reusable coffee cups and offering of different portion sizes). However, the individual acceptance of specific interventions moreover is significantly related to specific food choice preferences, general sustainable attitude and lunchtime habits. Overall, our findings imply a differentiated perspective on guests’ acceptance of sustainable changes in canteens. When deciding about such changes, it may be relevant to consider not only the possibilities and limitations of food service providers but to consider as well the food choice preferences, lunchtime habits and general sustainable attitude of guests. These factors may to a relevant extent contribute to the acceptance and therefore the success of sustainable restructuring.
How to make consumers more sustainable? An investigation on different food choice options

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Agriculture and food production are strongly linked to the natural environment, on the one side they are highly dependent on natural resources and on the other they pose strong pressures on natural systems. Such pressures are also expected to increase with the need to feed a growing world population and with diets shifting towards more animal-based products, especially in developing countries. This strengthens the need to involve single consumers in the search for solutions to global environmental problems like climate change. Indeed, there are interesting opportunities for reducing the environmental and climate change impacts of the food system by engaging with food consumers. Moreover, knowledge society trends are empowering citizens and consumers that are becoming more and more used to having an active role in many different sectors. Indeed, change in the food system cannot be driven only by technological innovation but also by social innovation. In this context, it is important to study consumer attitudes toward environmentally sustainable food-related behaviours. This work analyses the frequency of adoption, the motivations, and the barriers of 16 actions that consumers may undertake to reduce the environmental impacts of their everyday food choices. Such actions include decisions that are taken at the retail store and at home, before and after consumption. The aim is to evaluate feasible pathways to increase the environmental sustainability of food choices finding policies that might engage on the matter very different types of consumers. Indeed, the focus is on identifying a variety of behaviours that require different types of resources to be adopted, which may be available to different types of consumers. The originality of the work is to investigate jointly a large set of actions, focusing not only on those that require higher expenditures. Especially in urban contexts, money is not the only (or main) scarce resource. Another aim is to evaluate, for each action, the perceived likely outcomes of undertaking the behaviour (in terms of environmental, economic, and social impacts, and/or health-wise, or in terms of social and personal recognition) as these shape consumer attitudes toward the behaviour. Data were collected via face-to-face interviews with 320 respondents in charge of food shopping and dietary choices of their household in two large cities in Italy: Milan and Palermo. Data was analysed with dimensionality-reduction tools, and multinomial regression models. Preliminary results indicate that the most widespread actions are: not to buy from firms with a bad environmental reputation, to be careful of the quantities of food purchased, to be willing to change store to find more sustainable products. The main barriers are related to costs, time and effort depending on the action. However, attitudes, preferences, drivers and barriers change with socio-demographic and individual characteristics, highlighting that different types of consumers are willing to be sustainable – not only at different levels – but also in different ways. Indeed, differently from previous literature, given the larger variety of actions considered, our results show that not only ‘richer’ people are willing to be sustainable.
Organic products unpacked: Do organic buyers promote sustainability?

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The organic food market has shown substantial growth due to an increasing consumer demand, but also due to better availability in big retail chains. Compared to farmers’ markets, in retail organic products (and primarily fresh produce) are mainly sold packed. Although packaging promotes branding and enables certification of organic products, it contradicts with the idea of promoting sustainability. Therefore, organic product buyers may eventually not support the environment if they buy organic products that are packed. In this paper the objective is to explore whether packaging forms preferences for organic food buyers and if eventually packaging prevents them from buying organic food products. In a series of online experiments, we find that organic food buyers have greater preferences for organic products that are packed. Paradoxically, non-organic buyers prefer unpacked organic products. We further find that health consciousness and biospheric values increase preferences for unpacked organic food, with the former showing a greater effect. We discuss implications for theory and practice.
SESSION 2C
Consumers trends towards food choices

Room: DEMOCRITUS

Chair: Filipovic Jelena
What determines consumers’ trust in the EU’s organic label? A cross country comparison of the role of institutional trust and consumer knowledge

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Tocco Barbara, Newcastle University Business School
Yeh Ching-hua, Rheinische Friedrich-Wilhelms- Universität Bonn
Hartmann Monika, Rheinische Friedrich-Wilhelms- Universität Bonn

In food markets characterized by credence attributes, trust plays an important role. The organic market is such a market as organic is a process attribute, which can neither be verified by consumers prior to purchase nor post consumption. As certified organic produce sells at a significant price premium compared to conventionally grown produce, incentives for opportunistic behaviour appear strong. Without trustworthy relations between buyers and sellers, the exploitation of asymmetric information regarding credence qualities, can destroy markets. Considering the extent to which consumers trust organic labels and its determinants are thus important. This study analyses the determinants of trust for the EU’s organic label, paying attention to both institutional trust and knowledge elements. It draws on institutional and behavioural perspectives regarding trust. Specifically, instead of treating the EU organic label as an ‘independent’ entity, the role of institutional trust towards the EU, as well as the level of knowledge towards specific organic attributes, are integrated. As evidence suggests that trust in organic labels varies significantly across states, our study also tests for heterogeneity across countries. The analysis uses a unique pan-European consumer survey which was administered to 5688 individuals across seven European countries (France, Germany, Hungary, Italy, Norway, Serbia and the UK). Our findings confirm the hypothesis that trust is the most important characteristic for consumers regarding labels. Focusing on the EU organic label, our results reveal that 67.1% of the survey participants failed to recognize the label, with recognition differing considerably across countries (14% in UK to 51% in France). Subsequent analysis concentrated on those who recognize the EU’s organic label. To better understand what determines consumers’ trust in the EU’s organic label we used ordered logit models, taking into account institutional-based trust in the EU, attachment to the EU, perceived benefits/losses of being in the EU, overall knowledge of the EU’s organic label, and individual factors, such as age and education. Institutional trust in the EU and knowledge of the EU’s organic label are found to be significant and positive determinants of trustworthiness in the EU’s organic label, however institutional trust exerts the largest impact, particularly in the UK, Serbia and Germany. To test the prediction that those who are negatively predisposed to the EU are likely to be sceptical toward the EU’s organic label and thus underestimate what it ensures in terms of qualities and vice versa, our sample is split into two groups, those having no/low trust in EU institutions or being indifferent, and those with average and above average trust in EU institutions. We find significant differences between the ‘low’ and ‘high’ EU institutional trust groups regarding perceptions of the EU’s organic label. The high EU institutional trust group is significantly more likely to consider the EU’s organic label trustworthy, possess substantial knowledge of the EU’s organic label and buy food carrying the EU’s organic label. Implications for policy makers and food supply chain actors are drawn.
Communicating the benefits of heirloom varieties – insights into consumers’ purchasing motives

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Agrobiodiversity is declining. On a global scale, around 75 percent of genetic resources of cultural crops are already lost. In Germany, a “Red List of Endangered Native Crops” has been established which includes heirloom vegetable varieties. Analogically to the “Red List of Threatened Species” it is supposed to highlight endangered varieties and give an incentive to safeguard them. A prominent strategy to save endangered vegetable varieties is on farm conservation. In order to make the cultivation of heirloom varieties attractive to farmers, a functioning value chain and marketing concept for these goods have to be developed. In Germany, heirloom varieties are currently mostly sold via direct marketing, e.g. in on-farm stores or at market stalls. Experiences from indirect marketing channels, especially organic supermarkets, are rare. As during the last 10 years organic supermarkets have gained a considerable market share, their potential for the sale and thus conservation of heirloom varieties has not yet been utilised. A major challenge for indirect marketing channels lies in the lack of personal communication between producer and consumer. As heirloom varieties need to be easily identifiable for consumers and are often in need of further explanation, specific communication tools for supermarkets are necessary. Such tools have already been developed in Switzerland and Austria and, on a regional scale, in Germany. However, a holistic marketing concept for (organic) supermarkets is missing so far. The motivation for German consumers to buy heirloom vegetable varieties, including their specific demands regarding communication in different marketing channels, will be explored in a qualitative study. As one potential communication tool, the “Red List of Endangered Native Crops” will be discussed. This paper seeks to answer the following research questions: • what motives do consumers have to buy heirloom vegetable varieties? • How do consumers perceive existing communication tools for heirloom vegetable varieties? • How do consumers perceive the red list for threatened vegetable varieties as an appropriate communication tool for heirloom vegetable varieties? In order to pursue these questions, in June 2018 three focus group discussions will be conducted in Berlin (Germany) with consumers from different target groups. Based on the results, communication approaches for heirloom vegetable varieties will be created and used for the development of a holistic marketing scheme for organic supermarkets in Germany. This will be an important step to make heirloom vegetables accessible to a greater share of consumers.
Drivers of consumers’ choice of cheese: 
Heterogeneity between countries, similarity between consumer’ segments across countries

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The aim of this paper is to provide insights into consumers’ preferences for product and process attributes of cheese across consumer segments in seven European countries (France, Germany, Hungary, Italy, Norway, Serbia and UK). Cheese was selected as study object because of its relevance in food consumption in the countries considered and due to the large number of product and process attributes potentially determining consumers’ preference for cheese. Our analysis is based on object-case best-worst scaling (BWS) experiment. 14 attributes of special relevance in consumers’ food purchase decisions of cheese were selected based on a review of the relevant literature and discussions. The attributes were assigned to blocks using an orthogonal frequency balance design. Each version had six choice sets displaying five attributes at a time. In each BWS task, respondents were asked to choose the attribute that they find most or least important when purchasing cheese. Data were collected via online surveys in autumn 2017. A total of 3698 European consumers took part in the survey. Exclusion of those not living in the respective country, those not being at least partially responsible for their household food shopping and those not consuming cheese leads to an overall valid sample size of 2759 (FR=391; DE=396; HU=397; IT=387; NO=412; RS=394; UK=382). For data analysis, we use first, the hierarchical Bayesian estimation of the mixed logit model (HML). Second, to allow for consumer segmentation, latent class analysis (LCA) is applied. Based on the LCA model fit measures (Akaike information criterion and Bayesian information criterion), participants in each country were categorized in three segments, respectively. The findings of the HML show that in all countries taste is by far of the highest importance to consumers when buying cheese. Also of high relevance is the price, which ranks second in four of the seven countries. Our results indicate that while some attributes are of relevance in some countries (e.g. Product’s country/region of origin in Italy and France), they get considerably less attention in consumers’ purchase decision in other countries (e.g. Hungary, Norway). The LCA results show a considerable heterogeneity in preferences with respect to product and process attributes of cheese between consumer segments in each country. Interesting, however, is that we do find consumer segments with similar preference structure across countries. For example, in each country there is in general one consumer segment, though different in size, attaching a very high priority to the attributes taste and price. In all countries but Serbia those segments value compared to the other consumer segments in the respective countries also e.g. the visual appearance of the product very high while e.g. traditional methods used in the production/processing of the product receive less attention. Based on our findings we can conclude that though considerable differences exist between countries at an aggregate level in consumers’ preferences regarding cheese we do find segments of consumers in each country that share more similarities than differences. The size of those segments, however, differs between countries.
Generation Alpha and the Waste of Food. Can they possibly stop it?

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Generation Y also known as “Millennials” creates the generation of young people (24 – 40) all around the world. The consumer behaviour of this generation has been a concern for many marketers and researchers. Children of consumers from this generation born after 2010 are called “Generation Alpha”. Generation Alpha comprises children who have never lived without internet and modern technologies. They are different from generations Y and Z and we hardly know anything about them yet. The main aim of this paper was to investigate attitudes of parents from the generation Y to the wasting of food and to investigate their shopping styles. The relationship between the willingness to waste of food and individual shopping styles was discovered. We also found out that attitude to wasting of food is a sensitive problem and consumers have a tendency to respond socially desirable. Another aim was to investigate the parenting style of parents from the generation Y and predict the possible consumer behaviour connected with the food wasting of their children. It was found out that children with parents who do not waste food are more sensitive to demonstrations of problems connected with food wasting.
Western Europe is characterised by high per capita dairy consumption, reflected, among other in higher than average consumption of cheese. The maturity of this region within dairy is also demonstrated in the trend of the declining in the value sales in 2017 of the four of the top five dairy markets in Western Europe – Italy, the UK, France and Spain. The decrease is mainly induced by the changes in consumer diets, which negatively impact the demand. However, the other reason may be looked in the market saturation with established cheese brands and the preference of new generations to constantly strive for greater products diversity. In addition, being digital nomads, their shopping patterns are highly affected by the possibilities related to online purchase, distribution and comparison of prices. This study aims to investigate how Sjenica cheese, registered Serbian PGI product, can establish better recognition in the regional market and increase its sale volume. Building on the marketing mix approach, four aspects of Sjenica cheese have been investigated: product’s characteristics, price of the product contrasted to the main competitors in Serbian and European market, distribution channels that are used for its sale and promotional tools that are used for its communication in the market. Main obstacles regarding the legislation and export have been reviewed as well, while measures at the policy level have been proposed. The research applied in-depth interviews and observation as the research methods. Overall, twenty six in-depth interviews were conducted, five with the major producers of Sjenica cheese, one with the representative of the producers’ cluster, six with the diverse distributors (farmers and retailers) and fourteen with the consumers. Observations have been performed in thirty shops of the five biggest retailers’ chains, in seven farmer’s markets and at the online selling points (web shops, Facebook ads and online market). The analysis of promotional materials included inspection of packaging; web site of the producers’ cluster and ads on YouTube, given that, up to the knowledge of the researchers, there was not any other tool of promotion. The results showed that low recognition of PGI label among Serbian consumers, lack of the presence in the markets and large packages negatively impact domestic consumers to purchase Sjenica cheese in higher amount. The main challenges for the export are recognized in the inadequate certification of Sjenica cheese for EU market, the process of the production which has not been standardized and therefore results in the variations of the product quality, and unawareness of the regional consumers of Sjenica cheese due to insufficient communication efforts. In terms of overcoming of the listed barriers, the good practices of the international competitors are discussed and innovation related to consumer-producer partnerships and the use of new technologies is explored.
SESSION 2D

Drivers of consumer’s food choices

Room: THEOFRASTUS

Chair: Vlotzos George
Consumer Trends and Attitudes to Functional Foods

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Zevgitis Panagiotis, Agriculturist
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Mattas Konstadinos, Professor, Aristotle University of Thessaloniki

Consumers' needs have grown to such an extent that they are sought out of nutritious and pleasant organoleptic foods, as well as functional foods with special advantages for human health. Within the last two decades, consumers have placed more emphasis on foods that promote well-being and reduce the risk of disease than just satisfying hunger. A potential revolution restores the doctrine of Hippocrates that is a new category of 'enhanced' foods with healing-pharmaceutical characteristics, appearing on supermarket shelves and health food stores, known as 'functional foods'. These foods appear on the market as having some special additional physiological function in addition to their basic nutritional value and are becoming more and more popular with consumers. Consumers appear to prefer these foods either because they help prevent chronic illnesses or because they enhance health through energy increasing and boosting the immune system. The present study aims to investigate consumer attitudes towards health nutrition products and particularly functional foods. Primary data were collected through a combination of a qualitative and quantitative survey (structured questionnaire) to a sample of 325 consumers in the region of Thessaloniki. A series of multivariate techniques were employed to analyse the data, namely factor analysis and K-means cluster analysis. Cluster analysis was applied to identify groups of consumers based on variables that referred to i) the reasons of buying (or not) functional foods, ii) various statements about functional foods, iii) the recognition and use of functional foods and iv) the necessary information about functional foods. The results of the quantitative research have shown that consumers are interested in eating healthy, whereas as concerns functional foods, consumers' knowledge of the concept of functional foods is particularly low, although the recognition and use of most of these foods are high. Consumers' attitudes are positively related to issues associated with the necessity of functional foods, though, their attitudes are neutral in statements that refer to the benefits of functional foods for their health, their confidence in them, their taste, functional foods as part of healthy diets, and low-fat foods. As for the reasons of why consumers buy functional foods, their belief is that these foods can contribute to a balanced diet. On the contrary, the motives for not buying functional foods involve consumer's belief that traditional foods are better, the fact that functional foods are not included in their normal markets, and their hesitancy in consumption of products that are unknown to them. Finally, the impact of various socio-economic factors, such as gender, marital status, and age, has been statistically significant in consumer beliefs on functional food issues.
A Study on Consumption of Composite Flour and Bread in Global Perspective

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Engindeniz Sait, Ege University

The purpose of this study was to determine composite flour and bread consumption, analyze economic efficiency by compare of Kazakhstan, Turkey and other countries. Data were obtained from the online questionnaires of 376 families from different countries. The families were classified into three categories on the basis of their income level. According to the study results, mean families consuming different types of flour and bread and composite flour consumption per capita was 2 kg/day, but bread consumption per capita was 2 piece/day. Chi-square analysis showed that country, family size, age, sex, income and occupation had significant effect on flour and bread consumption. It was detected that the price of composite flour products and breads is related to the income of family. As of the survey date, the average monthly income of the families was calculated as 675 USD and average income per person was calculated as 170 USD. Spending of composite flour products and bread for families were found as 6 USD. When the price of flour products and bread associated with income of family, these products were seen as reasonable and practical products. Although the education level and occupation of consumers varied, flour and bread were preferred by every age group of consumer as a conventional taste whether it is a healthy food or not. One of the most influencing factors on consumers to purchase flour and bread was determined as healthy production conditions and all the shopping facilities of sellers. Key words: Consumer preferences, consumer behaviors, composite flour consumption, bread consumption, global consumption.
Drivers and barriers of organic food purchases. How to gain new customers in low-developed product categories

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Hamm Ulrich, University of Kassel, Department of Agricultural and Food Marketing

Even though sales volume for organic food has increased rapidly over the last years, yet many product categories such as sweets, alcoholic beverages or frozen food lack behind this development while organic milk, vegetables and eggs benefit most of all from the organic trend. It seems that frequently named motives for the purchase of organic food, i.e. health, taste and environmental benefits, do not hold true for low-developed organic product categories. Many studies showed that the most important reasons not to buy organic products are low availability, high prices and a negative quality image especially with regard to taste. In light of the continuing expansion of the organic product range in discount stores and supermarkets, it is highly relevant to identify purchase drivers and barriers to develop well-targeted communication strategies to attract new organic food buyers. The identification of drivers and barriers for low-developed product categories have not yet been studied in depth with real purchase data. Most of the research studies so far based on consumer surveys and experiments. Self-evaluation or reporting is often biased by an overestimation of organic product purchases caused by effects of social desirability. Since attitudes do not necessarily transform into behavior, the consideration of real purchase behaviour is crucial in this context. The study examines German households’ real purchase behavior. The data is provided by the market research institute GfK and consist of 13,000 households who reported their food purchases in 2016. In this contribution, determinants of the overall organic purchase behaviour will be identified through multivariate analysis techniques. The aim is, firstly, to identify motives for organic food purchases and, secondly, to characterize the typical organic food consumer. Moreover, it is to be figured out if the choice of shopping location has an impact on the organic purchase behaviour. In the next step, we estimate separate regression models for specific product categories. We specifically focus on product categories with a low market share (low-developed product categories). It is hypothesized that purchase behaviour with regard to specific product categories differ a lot from the overall organic purchase behaviour and that the attitude-behaviour gap is much higher within these groups. The study will give product-specific marketing recommendations for the further development of the organic market and how to minimise the attitude-behaviour gap.
Consumers of the Future? Young Adults and their Attitudes towards Organic Food in Germany

Klawitter Maren, Thuemen-Institute for Market Analysis

Given that the consumption of organic food is a topic with increasing importance in the context of preserving ecosystems, this contribution focuses on consumers’ attitudes towards organic food in Germany. The relevance of exploring attitudes arises from their influence on consumer behavior: Well-established theoretical models (i.e. Theory of Reasoned Action, Theory of Planned Behavior) determine attitudes as important predictors of behavioral intentions and thus behavior. Although it has been argued that attitudes are not always directly transferred into action, their impact on buying organic food has nevertheless been demonstrated in several empirical studies (e.g. Aertsens et al., 2009). Although the sales of organic food follow an increasing trend, the market share in Germany was only at 4.7% of all food expenditures in 2015. Focusing on young adults as the consumers of tomorrow could be one measure to increase the organic market shares. But although this generation constitutes a promising new customer segment, very little is known about their attitudes towards organic food. In order to contribute to closing this research gap, the perceptions and attitudes of young adults (18-30 years) in Germany regarding organic food will be examined empirically. Both qualitative and quantitative methods are integrated in a mixed methods design (i.e. an exploratory sequential design). First, three synchronous online focus groups with in total 29 consumers and non-consumers of organic food have been conducted. The qualitative data analysis of these chats aimed at displaying the variety of perceptions and opinions regarding organic food in this age group. The results of the exploratory study indicate that young consumers in Germany hold a rather negative opinion towards organic food. Environmentally friendly and sustainable consumption seems to be of great importance, but organic food is not necessarily considered as a means to act sustainable. Since the most of the participants do not trust the certification, the control system, and the producers of organic food, they do not rely on the sustainability of organic food. Moreover, organic food is regarded as unsustainable due to unnecessary plastic wrappings and long transport routes. As opposed to that, local food seems to enjoy a good reputation, since it truly reflects the idea of sustainable food. Based on these exploratory results, a quantitative online survey is conducted to generalize the findings. Thereby, attitudes are assessed and cluster analyses are performed to reveal typical attitudes of young consumers towards the produce of organic farming. Moreover, knowledge gaps and misconceptions regarding organic food will be uncovered. These results could be used to develop targeted provision of information in order to improve attitudes of young adults towards organic produce.
Assessing the drivers for yogurt consumption

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This research assessing the drivers shaping consumers’ attributes towards yogurt consumption. The survey was conducted on a sample of 1736 consumers on a national basis. Data collection was made by distributing a developed questionnaire through social media as well as face to face interviews. Principal Component Analysis (PCA) was used to identify consumer perception comparing the overall sample. Seven major factors were revealed: impact of good health, influence of media and friends, cost of purchase, product quality, direct preference for Greek style (strained) yogurt, non-willingness to purchase, and direct encouragement by family members and doctors for yogurt consumption. Young adults appear to have a limited consumption of yogurt, while married consumers over 45 years old are the most frequent users of the product. Quite important parameter is also the income level, with the wealthier ones to consumer yogurt more frequently. One of the most significant findings is the fact that consumers are not willing to purchase own label yogurt, even if its price is substantially lower (more than 20%). The same tendency follows the own label yogurt desert. On the contrary though, they are willing to pay the same price for Greek yogurt. The aim of this survey was to identify the consumer profiles of consumers and create different promotion strategies for different types of this product.
SESSION 2E

Agricultural Trade – Impacts of CAP REFORM

Room: ARISTOTLE

Chair: Zopounidis Constantin
Trade costs and productivity in the agricultural sector

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Trade costs play a crucial role in determining the level of trade that occurs between countries. Notwithstanding the importance of trade costs there are very few researches coping with their contribution on productivity in comparison with the extended literature of the impact of other factors that form the international trade. And if – as alleged – researches about trade costs and productivity are very few, the literature with regard to the agricultural sector is non-existent. The investigation of the afore-mentioned impact has a great importance on a sector level because the levels of productivity do not differ only among the countries but among the sectors of economic activity within a country as well. As a consequence of all of the afore-mentioned, the current paper attempts to give one first indication for the relationship of trade costs and productivity in the agricultural sector without examining through which transmission channels this impact is created. More specifically, the study utilizing a new measure of trade costs tries to provide some first evidence on the link between trade costs and productivity in the agricultural sector. Using a panel data of readily available data, across the 34 OECD member countries, the paper tries to assess and estimate the impact of trade costs on agricultural sector productivity for the 1995 – 2014 period. According to the results, there is strong evidence that when the agricultural sector faces lower trade costs it tends to be more productive and there is some evidence that it experiences higher productivity growth too. In line with the literature on manufacturing firms and services sectors, the results support the hypothesis that lower trade costs are associated with higher productivity and faster productivity growth in agricultural sector. As regression results indicate, a reduction of agricultural trade costs by 10% can stimulate agricultural productivity by 0.65%. This is an effect of greater magnitude to that for goods and services sectors. Additionally, a reduction of agricultural trade costs by the same rate (10%) can lead to 0.74% raise in agricultural productivity growth. Key – words: productivity, trade costs, gravity equation model
Assessing agricultural trade integration among EU and Mediterranean countries: Countries signed under the Agadir Agreement

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Nowadays, regional trade agreements are quite common among countries and it is estimated that every country in the world is a member of one or several regional agreements. Most countries have developed and strengthened their trade relations through various arrangements from colonial preferences to bilateral treaties to regional agreements, based on geographical proximity and economic similarity, with the purpose of spreading the socio-economic benefits of globalization. Among them, one of the more recent is the Agadir agreement. The latter is open to further membership for all the Arabic-Mediterranean countries and its purpose is to facilitate integration among EU and Mediterranean countries under the Euro-Mediterranean partnership or EU-Mediterranean process (EUROMED). After 10 years of the Agadir agreement in force, this paper attempts to assess the agriculture trade integration among countries signed under the agreement, namely Morocco, Tunisia, Egypt and Jordan, by evaluating firstly the degree of sectorial and geographical dispersion of the four countries agricultural exports and secondly appraising the extent of agricultural trade complementarity towards EU countries. In this study, using the available agricultural trade data for the period 2007-2016 and the classification of the 24 agricultural sectors (CN codes 01-24), we build three trade indices: Regional Hirschman, Sectorial Hirschman and the Trade Complementarity Index. Finally, we discuss the results and highlight the limitations and the challenges that hinder agricultural trade integration among southern and northern Mediterranean countries.
Assessing the impact of Direct Payments convergence on farm income inequality: the Case of Italian farms

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On 29 November 2017, the European Commission presented a communication outlining ideas on the future of food and farming. The communication comes after a consultation on the future of the Common Agricultural Policy (CAP) in order to better understand where the current policy can be simplified and modernised. Support for farmers will continue through the system of direct payments, but the communication acknowledges that the way in which these payments are currently distributed needs to be revisited in order to achieve a more balanced distribution of support between farmers. The achievement of a more balanced distribution of direct payments was already stressed in the CAP reform post 2013. For that purpose, the Commission introduced different mechanisms of convergence of direct payments (DPs) towards a uniform value at the national (or regional) level. Indeed, for the implementation of direct payments over the period 2015-2019, Member States had the possibility to choose between three main different options: a full convergence in 2015, with the same unit value per hectare as from 2015 (chosen by 3 Member States); a full convergence in 2019 (chosen by 7 Member States); a partial internal convergence, with a progressive and limited reduction of unit values over the period (chosen by 11 countries, Italy included). The objective of this paper is to evaluate the effects of the internal convergence of direct payments at farm and territorial level in Italy, comparing the level of DPs between the baseline (2014) and the post reform period (2019). The analysis is based on a sample of 8,973 farms belonging to the Italian Farm Accountancy Data Network (FADN), that is a yearly survey carried out by the Member States for the systematic collection of accountancy data on incomes and business operations of agricultural holdings and represents the only source of micro-economic data harmonized at European level. Through the decomposition of total income concentration into different income sources, the Gini coefficient decomposition allows to assess the role played by different income components in generating total income concentration. Each income component influences income concentration according to how important that source of income is, and how it is distributed among the sample, as well as according to the level of the correlation between this income component and the rank of total income. The results show a shift of public support toward mountain areas, which could reduction of income concentration, as DPs are less concentrated in mountain areas than in other areas. The results allow to assess the effectiveness, in Italy, of the current (and future) redistributive mechanisms under direct payments; in particular, the redistributive policy might contribute to pursue the goal of reducing total income inequality among Italian farms.
A framework of export supply chain for fresh fruits and vegetables

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Ozkan Burhan, Akdeniz University

The main objective of the study is to develop export supply chain model for producer-exporter relationships in fresh fruits and vegetables industry in Antalya. For this aim, three major exportable crops (tomato, fresh pepper and orange) representing fresh fruits and vegetables sector were selected and new supply chain model was developed for these crops. The primary data used in the study collected from producers and exporters by using a face to face survey in 2017 production year. In the scope of the study, re-modelling of supply chain was developed for selected crops via case study analysis as a qualitative analysis method (with 10 cases for each crop). Network theory was utilised for re-modelling of the supply chain. In addition, the current problems of producer-exporter supply chain were determined for each crop and suggestions were developed in order to cope with these problems. It is expected that the findings of this study will contribute ahead of producers and exporters in Antalya, to all actors involved in the supply chain fresh fruits and vegetables.

Keywords: fresh fruits and vegetables, Antalya, producer, exporter, supply chain, network analysis.
Agro-policy impacts on olive sector: a retrospective view

Chousou Charoula, Department of Agricultural Economics - AUTH
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Mattas Konstadinos, Professor - Department of Agricultural Economics – AUTH

The Common Agricultural Policy (CAP) is the main European Union (EU) policy instrument directly affecting olive farming in EU. The accession of Greece and Spain in 1981 and 1986, respectively, converted EU from an importer to a pure olive oil exporter. Thus, in the subsequent decades the EU's olive oil policy has undergone several revamping attempts in order to maintain and strengthen its position in world markets, by encouraging production of a high-quality product for the benefit of growers, processors, traders and consumers. This paper offers a retrospective view of the EU's olive oil policy and then considers current and future perspectives of the olive oil sector, as olive cultivation is important for the rural economy and maintenance of local heritage in many regions of Southern Europe, and attracts the interest of both EU and world agriculture.
SESSION 3A
Sustainable diet and food choice process

Room: PYTHAGORAS
Chair: Jose Maria Gil
How can healthier diets and sustainable lifestyles foster sustainability in farming systems?

Campos Susana Isabel, Universidade de Trás-os-Montes e Alto Douro

Population growth, ageing and urbanization affect consumption habits through different channels, as well as the development of agri-food production activities. Challenges need to be faced and the first consequence is the necessary increase in crop production, to meet the increase demand for feed. However, the shift towards more high value product will change the context of food security. The way we respond to the requirements relates to the new paradigms of production and consumption, which go far beyond the systematization of experiences in innovative agriculture. To understand these changes, it is necessary to explore the changing in consumption patterns that requires more land intensive production and how the factors associated with this change dialogue with new paradigms of production. This paper aims to explore the perspectives of new consumption and production paradigms of food, held in a changing scenario, in which case the transition from agricultural models based on monoculture and packet technology for production systems compatible with diversity of local ecosystems and the cultural systems that considered the economic, environmental and socio-cultural dimensions toward sustainability. This paper focused on the concept of Mediterranean diet such an example of a sustainable diet that promotes local production and consumption and, encouraging sustainable agriculture and safeguarding landscapes with lower environmental impact. We explore the case of Portugal. With this paper we intent to answer how sustainable consumption and production ensure healthier diets and lifestyles.
The Complexity of Implementing a Sustainable Diet – An Ethnographical Field Study based on the Food Choice Process Model

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Simons Johannes, Institute for Food and Resource Economics, University of Bonn

Food choice involves very complex and partly unconscious information processing. In the last decades, sustainability deliberations have gained importance amongst consumers – which did not facilitate food choice processes. In the current study, we use the Food Choice Process Model by Furst et al. (1996) as a theoretical framework to investigate how German consumers value sustainability in the context of their food purchase and consumption decisions. Special interest was paid to the attitude-behavior gap and to decision strategies used when making sustainable food choices. Based on an ethnographical fieldwork, this study follows a qualitative approach to investigate sustainable food choice. Data was collected through in-depth-discussions combined with observational methods. Over the course of nine months we repeatedly visited six families. We included families living in urban, semi-urban and rural areas of North Rhine-Westphalia, Germany’s biggest federal state in terms of population. For a better understanding of the attitude-behavior gap, we selected households which perceived themselves as being involved with healthy and pro-environmental food behavior to some degree and which stated a positive attitude and the intention to buy sustainable food products. Furthermore, we focused on families with children due to two reasons: First, families with children are usually more likely to consume organic food in order to secure the health of their children (Hill and Lynchehaun 2002; Freyer and Haberkorn 2008; Riefer and Hamm 2011). Second, differential preferences of children and parents and, often tighter monetary restrictions, both increase the complexity of the decision process (Freyer and Haberkorn 2008). Our findings show that the valuation of sustainability aspects in food choice is influenced by a vast amount of factors. Those include experiences during the life course, especially those from childhood, personal ideals, availability of resources, for instance time and money, and accessibility to certain food products. Participants link sustainable food products to organic production methods, naturalness (regarding the degree of processing and packaging waste) and local products. When making respective food choices they expect benefits for personal health, animal welfare and/or the environment. However, those considerations are affected by other often conflicting food values like sensory characteristics (especially taste), convenience and the need of managing or avoiding family intern conflicts. Furthermore, attitudes toward sustainable food products appeared to be based on vague feelings and fragments of information from different sources and not on comprehensive knowledge. A positive attitude and even the intention to purchase sustainable food products alone have been found to be weak predictors for actual food choice. To minimize cognitive effort, people use heuristics and strategies, especially for decisions reoccurring frequently. We found evidence that our participants employ self-enacted rules of avoiding, limiting, and substituting certain products or product characteristics, in order to simplify the decision making and act according to what they perceive as sustainable food related behavior.
From ancient to refined wheat with different perspectives: from nutritional value to consumer preferences

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Raptou Elena, Democritus University
Mattas Konstadinos, Aristotle University of Thessaloniki

In recent years, the relationship between diet and human health has gained much attention from both consumers and practitioners. The Mediterranean diet has been acknowledged as a model of healthy eating for its contribution to positive health outcomes and a better quality of life. Furthermore, the emerging trend toward more sustainable food systems and diets has accelerated the interest in the Mediterranean-style diet. Wheat and wheat products comprise essential food components within the Mediterranean cuisine. The increasing interest in local food products and highly nutrient crop alternatives has also emphasized the importance of selecting appropriate wheat crop varieties for bread and bakery products. This study sought to investigate i) consumer preferences on flour types using bread samples from four different types of wheat, namely refined (Triticum aestivum L.), einkorn (Triticum monococcum), firik (Triticum durum Desf.), and emmer (Triticum dicoccum) wheat, and ii) the effect of different wheat flour types on bread making process and perceived differences in bread nutritional values. Sensory evaluations were performed in order to analyze consumers’ preferences of ancient wheat flours. Hedonic tests were applied to eight bread samples produced under two different production techniques (sourdough and fresh yeast). In the first two sections, participants evaluated and ranked the sample breads of the four different wheat flours, produced by either the fresh yeast or the sourdough technique, for their taste, their texture, their odor and color, and their overall acceptance. In the third section, a preference test was conducted for each wheat type assessing whether there is a clear preference for any of the bread production methods. From the nutritional perspective, less glycemic index and low gluten value made the difference between ancient wheat flour and refined wheat flour. Breads produced from traditional wheat samples had higher antioxidant capacity. Turkish consumers were also concerned about the possibilities of genetically modified (GMO) wheat production and the usage of GMO wheat products in foods. According to our findings, all the wheat products that we test were GMO-free.

Keywords: ancient wheat, nutritional value, sensory Analysis, refined wheat, einkorn wheat, firik wheat, emmer wheat
Interplay between diets, health, and climate change

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The world is facing a triple burden while feeding its population. Currently, around 800 million people are undernourished and suffering from hunger while around 2 billion adults are overweight, including 660 million people suffering from obesity. At the same time, the current agriculture exhibits huge environmental impacts, e.g., the agriculture sector is one of the major sources of anthropogenic greenhouse gas emissions. Therefore, a global challenge is to sustainably nourish the growing population. Addressing this challenge is very important to attain the Sustainable Development Goals (SDGs) and to meet the Paris Agreement to limit global warming well below 2 degree. We contribute to address the global challenge by investigating interplay between diets, health, and climate change for the last six decades. For this, we identify typical dietary patterns using cluster analysis. We use data on supply of the 14 different food groups in calories, and supply of plant and animal proteins and fats for 217 countries and regions from the FAO database (FAOSTAT) to identify the dietary patterns. Afterwards, we link the identified dietary patterns to the recommended healthy diets (RHD) by WHO and estimate of required calories by Hic et al. (2016) to understand how far/close the diets are to RHD. Afterwards, we investigate observed prevalence of undernourishment, underweight, and obesity associated with the dietary patterns by using data from FAOSTAT and NCD-RisC. Further, we identify typical diet shifts occurred during the last six decades based on the identified dietary patterns. The 11 typical dietary patterns with varying calorie supplies and compositions represent the dietary habits worldwide for the last six decades. Vegetal products provide most of all three macronutrients (carbohydrate, protein, and fat) in developing countries while animal products provide majority of protein and fat in developed ones. The total calorie supplies are lower than required for two patterns. Sugar consumption is larger than recommended for five dietary patterns. Three and five patterns consist of larger than recommended carbohydrate and fat shares, respectively. For six patterns, protein share is close to the lower recommended value. Only two patterns consist of at least 400 gm/cap/day of fruits and vegetables while accounting for food waste. Prevalence of undernourishment and underweight dominate in the diets with lower calories while a higher prevalence of obesity is observed for diets with larger calories with high share of sugar, fat, and animal products. The emissions associated with diets do not provide conclusive picture in terms of calorie supply and composition. Two high calorie diets embody more than 1.5 t CO2eq/cap/yr, and two low calorie diets, around 1 t CO2eq/cap/yr. In conclusion, the identified dietary patterns deviate from the RHD in one measures or another. Countries having diets with higher calories, sugar, and fat also consist of a higher prevalence of obesity and overweight. Hence, sustainable and healthy diet can serve both purposes to nourish the population at the same time to reduce agricultural environmental impacts.
Risk Attitudes of Obese Individuals in Catalonia? A Prospect Theory Application

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Jose Maria Gil Roig, Centre de Recerca en Economia i Desenvolupament Agroalimentari (CREDA)

After the UK, Spain has the highest prevalence rate of obesity in the EU (OECD, 2012). The last available National Health Survey showed that in 2011–2012 the prevalence of overweight and obesity among Spanish adults was 53.7% (ENIDE, 2012). The prevalence of obesity and overweight has mainly been attributed to unhealthy dietary composition (large amount of red meat, soda, and pastries) and a lack of physical exercise. However, literature suggests that the spread of obesity and related diseases are multifactorial. We have combined field experiment and household survey data to investigate whether obesity is affected by risk preference of consumers in Catalonia. Past studies have found that risk aversion to be negatively correlated with engagement in risky unhealthy behaviours such as smoking, drinking and overweight and obesity. To the best of our knowledge, no study has been carried out in Catalonia to explain the relationship between risk aversion and obesity. Using losses and gains lottery experiment of Holt and Laury (2002), we relied on prospect theory as the main analytical framework and estimates from Tanaka et al. 2010 to identify the parameters of the utility function under prospect theory for different households. In line with the findings highlighted by the existing literature, we found that risk aversion reduces with increasing BMI, suggesting that normal weight individuals are more risk averse than overweight and obese people. Similarly, older people are more risk averse than younger people. Males are less risk averse but insignificant. We decided to include the probability weighting coefficient in our model to understand how it affect risk, we found that risk averse individuals underweight probabilities hence respond less to probability information. Our results therefore re-enforce previous studies that to suggest that policy that does not take risk preferences into account may seriously underestimate the cost of obesity intervention programs, and undermine economic models of healthcare.
SESSION 3B

Sustainable Agricultural Practices

Room: SOCRATES

Chair: Lambros Lambrinakis
Understanding farmer’s behaviour towards sustainable practices and their perception of ecosystem services

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Rural landscapes face sustainability challenges and their resilience depend on ability to supply regulation and cultural ecosystem services (ES) along with production ES. There is increasing scientific evidence of sustainable farming practices benefits. However only a reduced number of farmers adopt it. In the later years social scientists have investigated the motivations underlying farmer’s behaviour, both in developed and developing countries, addressing different farming systems and farmers’ styles. The results highlight the importance of socio-psychological factors like attitudes, subjective norms and perceived knowledge on intention and on actual adoption of sustainable practices enhancing balanced provision of ES. This presentation focus on the case of chestnut tree growing in the Northeast of Portugal. This is a centenary culture in the mountainous areas of the region grown as an agroforestry system that integrated chestnuts with pastures and/or annual crops. However, since the 1990s, due to high price of chestnuts the planted area increased dramatically and the agroforestry system was mostly abandoned. Currently farmers fight pests and diseases and climate change effects that decreases their productivity in spite of an increasing area. Agroforestry and related practices are the solution recommended by scientists. We present the results of implementing the Q-Methodology in order to understand the farmers’ views regarding agroforestry practices and how they relate with local agro-ecological variability, farmers sociodemographic characteristics, assets and social networks. The survey included 39 farmers (interviewed in April 2017). With factor analysis 3 perspectives were uncovered: ‘Productivity driven’, exhibiting utilitarian perception of ES; ‘Aware of ES relevance’ valuing ES public good dimension; ‘Technological solutions likers’ with little awareness of ES. Personal and farm characteristics don’t show influent explaining different perspectives, whilst local variability do. Results suggest incentives and extension practices to promote sustainable rural landscapes need to be shaped accordingly to local variability and farmers subjective understating.
Value of Ecosystem Services Provided Through the Use of Genomic Technology in Cattle

Goddard Ellen, University of Alberta

The value of providing ecosystem services in cattle supply chains is heavily influenced by final consumers. One issue with realizing this value is the apparent conflict in the eyes of the public about wanting ecosystem services but not necessarily wanting the use of genetic or genomic technologies to achieve productivity from the farm level to the consumer end of the supply chain. Often the desire for more natural production, for example, is associated with a desire for more ecosystem services and a desire for limited technology. Using data collected across the beef and dairy industries on the use of genomic selection to achieve higher feed efficiency for cattle, this research addresses the socially optimal level of feed efficiency desired in the cattle industries if it comes from either use of genomic selection in cattle breeding (more neutral genomic technology) or the use of gene editing (more controversial genetic technology) given different interests by consumers in pulling production change through the supply chains. Higher levels of feed efficiency can provide ecosystem services, maintained wetlands, for example, (as opposed to draining for feed production) in addition to reduced greenhouse gas emissions. Very few beef or dairy products are marketed, in Canada, with any information associated with environmental impact or ecosystem services. Our research has shown a preference for regulating industry (citizen) as opposed to purchasing product with reduced greenhouse gas emissions (consumer). This research is extended to include other defined ecosystem services to see if enhanced ecosystem services change public preferences. We also examine producer preferences for the use of technology to achieve feed efficiency (private gain) and each of reduced greenhouse gas emissions and other ecosystem services (public goods). With a stochastic equilibrium displacement model of the Canadian - North American (we currently have relatively open borders but that may change if NAFTA negotiations derail) cattle supply chains, we examine the implications for different levels of public acceptance and producer adoption on the optimal uses of technology to achieve feed efficiency and the resulting environmental impacts. Examining each of the beef supply chain (heavily traded within North America and globally with multinational dominance at the processing level in Canada) and the dairy supply chain (heavily regulated without significant trade from or into Canada) provides a view of the impact of different market structures on the determination of optimal feed efficiency levels. In addition both beef and dairy production are currently the subject of significant environmental debate, with changing consumer consumption patterns resulting to a varying degree across countries. Our modeling also recognizes the different approaches to improving environmental impact in supply chains: many meat companies are buying into non-meat based substitute supply chains and other players are engaging in identifying and promoting environmental friendliness of existing supply chains (Global Roundtable for Sustainable Beef). The potential for new uses of genetic technologies to achieve environmental outcomes given demand for environmental outcomes (including ecosystem services) by primary producers and the public is positive given cooperation from all players in the supply chain.
A direct costing approach to evaluate sustainable agricultural practices and the provision of eco-system services

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Sustainable food chains are topics of high interest for many farmers and consumers. One aspect of interest is the provision of eco-system services by agriculture and the costs incurred. Our contribution focuses on the cost-differential between more and less environmentally sustainable agricultural practices. We present an approach that is based on existing farm extension services data that allows us to evaluate systems of different agricultural practices at various scales such as farm level, regional level and national level. The presented modeling framework can be used for various purposes in the context of farm extension, consumer information and / or policy evaluation. Using wheat production, milk production and the cost of maintaining grassland in Austria as examples, we demonstrate how costs developed for different of variants of production practices and multiple years across regional units. The paper concludes with assessing benefits and drawbacks of the approach and explores options for further development.
Using mixed methods for mapping and evaluating ecosystem services

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Kassam Shinnan, Caritas Switzerland

In this paper we suggest how a mixed methods approach can be used to identify and evaluate ecosystem services. Mixed methods refer to the combination of qualitative and quantitative methodologies that can complement, support, and inform each other, and together provide powerful analytical tools for analyzing ecosystems. The qualitative part allows for a deep understanding of the issues and provides insights on how local stakeholders themselves, as well as other affected groups understand and deal with these issues; the quantitative part allows the estimation and monetization of the ecosystem services that are identified by the qualitative approach. One key advantage of applying qualitative methodologies relates to the involvement of multi-stakeholder groups, including agri-food value chains, local inhabitants, public authorities, and civil society organizations. The stakeholder groups provide invaluable insight and knowledge that typically is not available otherwise – e.g., why certain initiatives to protect local ecosystem areas succeeded and others failed, or how locals really make use of the ecosystem services in their area. Such insights are typically obtained through field visits, focus groups, interviews, as well as analyzing artifacts and relevant documents. Apart from these key insights, the qualitative approach also allows for identifying important ecosystem services – especially with respect to their value for the local population, trade-offs, and key policy objectives since different stakeholders can attach different values (e.g., according to cultural background, personal values, location, etc.). The quantitative methodology allows for different approaches and methods – the most typical being: market price, productivity, hedonic pricing, travel cost, damage cost (avoided), replacement and substitute cost, contingent valuation or choice. Although it is desirable to perform primary research, due to time and budget considerations one may opt to use the benefit transfer (BT) methodology, a commonly used alternative to primary valuation. In BT, environmental benefit estimates from existing case studies (i.e., study sites) are transferred to a new, policy case study (i.e., policy site) using: unit value transfer (UVT), benefit function transfer, or a meta-analytical function transfer where the estimation function is derived from the results of multiple studies. These different approaches offer advantages and disadvantages that mostly relate to data availability, the characteristics of the site, previous analyses, and resources available. By implementing a mixed methods approach and combining quantitative and qualitative methodologies, it is possible to gain invaluable insights and achieve a higher understanding of the examined ecosystem and its services. Our proposed paper builds upon the usage of mixed methods on selected case studies in Europe and Asia and illustrates how such methods can enhance our understanding of ecosystem services and improve the relevant estimates.
SESSION 3C

Food Waste Reduction and Exploitation

Room: DEMOCRITUS

Chair: Tsakiridou Heleni
Food waste reduction: exploring the sustainability of a “from food to feed” strategy in Europe

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Ferrazzi Giovanni, Università degli Studi di Milano
Balzaretti Claudia, Università degli Studi di Milano
Castrica Marta, Università degli Studi di Milano

The interest in innovative methods to implement the sustainability of food chains and thus reduce food waste is increasing rapidly due to the fact that around 88 million tons of food are wasted annually in the EU, with associated costs estimated at 143 billion euros. The development of systems that exploit the potential nutritional value of food waste as a resource in animal feed represents an opportunity to meet the objectives of circular economy. Nevertheless, this strategy to prevent that food losses turn into waste by applying a “from food to feed” approach is hampered by several technical and legal constraints. In this context, this study analyses the performance of an alternative system, based in US, which turns food surplus and other organic waste into animal feed and evaluate its applicability in the EU. Preliminary results showed that regarding the microbiological and nutritional quality, the final feed product appears to be compliant with the legal safety requirements for animal feed. However, considering current EU legislation on feedstuff, results indicate that food waste can be considered an alternative resource for animal feed only in specific conditions. In conclusion, the main requirement to improve the sustainability of the food system through a “from food to feed” strategy in EU is the creation of a network of expertise, able to implement new food recovery logistic chains.
Portion sizes, children’s health and potential impacts on food waste: school meals in Italy

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Ventura Vera, Università degli Studi di Milano
Balzaretti Claudia, Università degli Studi di Milano
Castrica Marta, Università degli Studi di Milano
Ratti Sabrina, Università degli Studi di Milano
Carruba Michele, Università degli Studi di Milano

Purpose: School catering services are characterized by a significant level of inefficiency regarding the food processed but not consumed during meals. On the assumption that the generation of food waste can occur at any point in the food chain, this work analyses the meal supply in primary schools in Italy in order to highlight new areas of inefficiency upstream of the food chain, regarding the size of the food portions specified in public tenders. A lack of conformity of food portions with nutritional guidelines can potentially lead to a double negative externality: overweight children and food waste. Method Based on the data contained in the contract between municipalities and school catering services, the analysis was performed on the portion sizes (in grams) of the main food products included in the school menu for each regional capital (RC) in Italy. Data analysis regarded two main aspects: consistency of food portions within regions and adherence to national guidelines on children’s nutrition. Results: The results revealed great discrepancies amongst regions and in several cases, portion sizes significantly larger than those recommended in the national guidelines for school catering. The study also profiles RC on the basis of portion sizes, school meal attendance, and childhood obesity rates. Conclusions: School meals have the potential to educate the next generation regarding healthy eating habits, and thus play a leading role in obesity prevention in children. Similarly, the educational role of eating at school can contribute to raising children’s awareness about one of the most urgent environmental challenges - food waste - by introducing the best strategies for waste reduction, reuse and recycling. Results have economic, social, health and environmental implications and highlight the need to revisit policies in order to introduce new solutions for more sustainable and healthy school canteens in Italy.
Retail Price Discrimination and Food Waste

Richards Timothy, Arizona State University
Hamilton Stephen, California Polytechnic State University

The amount of fresh food lost or wasted between the farm and retail levels is a relatively small part of the total amount of edible food lost throughout the supply chain, but still represents a substantial amount of lost economic value. Retailers either reject, discard, or donate some 19.5 million metric tons of edible, perishable food products in the US every year, so the amount of value lost is of considerable economic, social, and ecological importance (Buzby and Hyman 2012). In this paper, we argue that retail markets fail to completely intermediate the market for fresh food because retailers price-discriminate based on consumers' willingness-to-pay for quality. By setting quality standards that essentially truncate the distribution of willingness-to-pay above the minimum level supplied by farmers, retailers create waste as a consequence of normal, profit-maximizing decision making. We examine this hypothesis through a simple empirical model of a price-discriminating retailer, and test our theory empirically using a unique data set on fresh produce sales -- fresh produce that varies in quality across retail markets. When imperfectly-competitive sellers have the ability to offer goods that are vertically differentiated, it is well-understood that quality is distorted relative to that provided by a perfectly competitive market (Mussa and Rosen 1978; Shaken and Sutton 1982, 1983). More specifically, quality is distorted downward for all consumers but those with the highest taste for quality, and those with the least preference for quality can be excluded from the market (Crawford and Shum 2007; McManus 2007). In our example, the consumers who are excluded from the market are those who would buy "imperfect produce" or fresh food that does not make what retailers generally consider to be a saleable grade, whether for size, cosmetic, or shape reasons. If the distribution of willingness-to-pay for quality exhibits a probability mass at the left tail, or is otherwise truncated relative to what is grown, we use this information to infer how much produce is excluded from the market. Our identification strategy, therefore, uses the distribution of willingness-to-pay for quality to estimate the extent of food loss at the retail level that is due purely to price discrimination on the part of retailers. We frame our application of this empirical approach using retail apple sales from a major US retailer. We find evidence that the distribution of quality offered by retailers differs significantly from the distribution of quality produced on the farm. While the distribution of harvested-apple quality is log-normal, the distribution of quality actually purchased by consumers is substantially more right-skewed, with a probability mass in the left tail. We find that retailers effectively exclude approximately 10% of harvested production from their stores. Further, as the willingness to pay for quality rises by even small amounts (1%), the amount of food loss rises to over 25%. Price-discriminating behavior on the part of retailers appears to be a significant factor in retail food loss.
Approaches to Reduce Food Waste: Responsibility of All

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Grman Pavol, Slovak University of Agriculture in Nitra

In the world, every year there is more and more talk of food and food waste. This is an urgent problem because about one-third of food for people's nutrition loses ends in food waste. Food losses occur throughout the food chain starting from harvesting, continuing through the processing and ending with the consumption of household food. In more developed countries, food losses at the end of the food chain dominate. Mankind became spoiled with a huge accessibility of alternatives of vegetables, fruits, meat and almost all kind of food products which are being imported throughout the whole year to almost all countries of the world. Various price relations, plenty of shapes, colours and lucrative offers such as buy one and get one for free many times lead the consumer to actually buy much more there are needs and the ability of customers. The European Parliament's Agriculture Committee has adopted a resolution committing members of the Commission to take radical steps to reduce food and food waste from a farm to fork by up to 50% by 2025. The aim of the article is to show up on the major problem of food waste in industrialized nations, present the situation with food waste in EU and in the Slovak Republic and to propose suggestions to reduce food losses and food waste.
Public school meals in primary schools constitute an important sector in pupils’ nutrition intakes and public food procurement. This sector aims to enhance the dietary and the nutritional implications of the pupils by offering food of high quality. School food waste can have significant affection on the pupil’s nutrition intakes and comprises a tool to evaluate the efficacy of the school meals programs. The framework of the public-school meals firstly applied in Greece with the pilot program “School meals” during the school year 2016-2017 with 36 primary schools while on 2017-2018 the program expanded to 798 public primary schools. The aim of this study is to investigate the generated food waste from the Greek public-school meals and to assess the nutritional quality of the provided school meals. This topic has not previously investigated in the Greek primary-school meals context. Hence, the results of this study will reveal important information about the pupils’ nutritional intakes and the nutritional quality of the procured school meals that impact the local communities. A quantitative analysis carried out with field visits at three primary schools in the city of Thessaloniki, Greece and two primary schools in the rural region of Kastoria, Greece. The methodology of the aggregate selective plate waste measurement was applied in the selected five schools for five school days in order to produce tangible results for a weekly menu. Consequently, Multiple Linear Regression and Anova analysis applied to explore the relations between the produced food waste and the students’ age and gender. Furthermore, the evaluation of the school meals nutritional quality implemented with the adoption of the Healthy Meal Index (HMI). HMI is a healthiness scoring tool that was applied through the nutritional analysis of the ingredients that were used in the school meals. The findings of the food waste analysis shall reveal the pupils’ nutrient intakes and useful information about the efficacy of the applied public-school meals pilot program. The avoidable food waste may be a subject of re-designation of the procured school meals in order to enhance the palatability and the quality of the meals. The findings from the HMI tool will provide useful data that policy makers and stakeholders, such as caterings, can benefit in order to design and develop healthier school meals. Keywords: Public school meals, Food waste, nutrition intakes, nutrition analysis, healthiness measurement
SESSION 3D

Rural Development

Room: THEOFRASTUS

Chair: Gorton Matthew
Neo Endogenous rural development and the role of organic farming: two case studies from two different Italian fragile areas

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De Rubertis Stefano, Università del Salento, Dipartimento di Scienze dell'Economia
Sturla Alberto, CREA, centro di politiche e bioeconomia
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Viganò Laura, CREA, Centro di Politiche e Bioeconomia

The Neo endogenous approach proposes a model of rural development based on territorial needs and supported by local community, whilst identifying a precise role of extralocal actors and resources in starting and sustaining the entire process. In this paper we analyse two examples of application of neo endogenous approaches for local development. Both take place in small towns in Italian Apennines: Varese Ligure (North eastern Italy) and Castel del Giudice (Central Italy). Although both based on the valorisation of the existent and in pursuing the objective of curbing depopulation in the respective areas, the development processes undertaken by the two towns differ in some key regards. Varese Ligure has focused most of its endeavours on the environmental sustainability of the local context, thus making organic farming the pivot of the entire development process, although its integration with other economic sectors (e.g. tourism) is still in nuce. In Castel del Giudice, instead, development is pursued by mean of a strong diversification of the economic activities, although an organic supply chain plays a very relevant function in the community. Also the goal of involving local community has been pursued in different ways: based on the involvement of those who were directly interested in a specific action in Varese Ligure and more focused on giving responsibility to the stakeholders in Castel del Giudice. Even the engagement of the “extra-local” component has been interpreted in different way: in Varese Ligure it takes the form of an intake of financial resources from European funds, while in Castel del Giudice, besides the necessary public financing, private actors from outside has been fundamental in giving strength and vision to the entire process. Although through different approaches, the two towns have been able to produce local development and eventually new social arrangements that enhanced territorial resilience, prompted emulation from nearby communities and produces wealth that has been reinvested locally. By analysing and comparing the two case studies, this paper, on one hand, aims at bring to light the differences in local economic and social context that have generated such different methods; on the other, it focuses on their key factors in order to bring to light those elements that could be taken as a paradigm of successful neo endogenous processes. We therefore focus on the model of governance adopted, we analyse the role of local and external actors and investigate the mechanism of participation activated so far; we moreover come to discuss the role of organic farming as catalyst of social innovation. The study is supported by some ad hoc indicators, retrieved from both public data sources and field surveys that, besides showing that the two approaches have produced positive change in local contexts, highlight the guidelines along which the two case studies have developed.
Developing sustainable tourism in rural areas is not only important for environmental reasons but can also create important spillover effects that benefit local residents. Based on this idea, we develop a theoretical model of sustainable rural tourism that considers the well-being of local residents by including external effects and trade-offs with less sustainable forms of tourism. Moreover, we gather data for a rural tourism setting to determine indicators of sustainable tourism in a rural mountain area, which relate to the environment, food consumption and leisure activities. Empirically, we isolate some key attributes of sustainable rural tourism and the related willingness to pay of visitors by analysing designated farm holiday stays offered through the Red Rooster brand in South Tyrol, Italy. First, we identify factors that may influence tourist decisions to book a holiday at a farm, which include the number of flowers (a quality-rating scheme), the type of farm and accommodation, available amenities and facilities as well as possible leisure activities in the vicinity. Second, we develop several hedonic models to estimate implicit prices linked to typical leisure activities at destinations during the winter and summer seasons. Dependent variables are peak and low season rates on offer for farm holiday stays. Independent variables are environmental attributes related to possible activities in the area surrounding area, accommodation characteristics and food offers. The results show that the rural accommodation quality-rating scheme (number of flowers) and breakfast offers are significant for all models and have a positive impact on guest willingness to pay. In contrast, specific farm types, such as fruit growing and livestock operations have a significantly negative effect. Furthermore, distance variables relating to leisure activities are important depending on peak/low season and winter/summer destination. The hedonic models define a relative ranking of important indicators of sustainable tourism experiences in the area. The relative importance of these indicators derived from the models can be helpful in identifying successful strategies for sustainable tourism development in rural areas. For example, food related aspects are highly relevant, and developing respective offers will not only benefit visitors but it will also maintain sustainable agro-food chains and improve the well-being of local residents.
The purpose of this paper is to examine the relationship between corporate social responsibility (CSR) and dynamic productivity change of each input employed and investment undertaken in the U.S. food and beverage manufacturing industry. Productivity change is assessed via a dynamic production approach using Data Envelopment Analysis (DEA). Specifically, we compute input- and investment-specific dynamic Luenberger indicators and decompose them into the contributions of input- and investment-specific dynamic technical and inefficiency changes. Next, we relate these indicators with CSR measures. Results from the regression analysis suggest a negative relationship between CSR and dynamic productivity change for investments which is due to the component of dynamic technical inefficiency change. We also find a negative association between CSR and dynamic technical change for costs, while a positive relation is observed for dynamic technical inefficiency change for this input. Moreover, we find the negative relations for dynamic productivity and inefficiency changes for investments to be driven by the environmental and governance aspects of CSR, a negative relationship for dynamic technical change for costs to be due to the governance dimension of CSR, while the social dimension of CSR contributed to a positive association for dynamic inefficiency change for costs.
Organic farming as a driver for rural development - examples from Germany

Hoffmann Heide, Humboldt Universität zu Berlin, Faculty of Life Sciences, Agroecology & Organic Farming

Over the centuries, multidimensional agriculture has shaped the German Countryside, giving it its historical character and cultural value. However, beginning in the 20th century urbanization started in a global context. Mechanization and intensification as well as globalization mean that fewer and fewer people find work in rural areas and want to live in rural areas. Experts have defined the 21st century as the age of cities. A remaining problem is the demographic change in rural areas. Today, one of the main aims of agricultural policy has to be to develop rural areas as independent living spaces, to create employment by strengthening economic power, to ensure and improve local supply structures and to contribute to equal opportunities for all population groups. Organic farming can be a driver in this process. The new legislative framework of the Common Agricultural Policy (CAP) starting from 2014 to 2020 stress the importance of organic farming and increase its visibility in rural development through creating a separate "Organic farming" measure eligible for rural development funding (EU, 2017). In addition, the Common Agricultural Policy of the EU (CAP recognizes the role of organic farming in responding to consumer demand for more environmentally friendly farming practices. Organic Agriculture is a strategy-tool for rural development and creates positive conditions for rural developing. This becomes visible in: • Securing and creating jobs in the rural areas, including for people with disabilities (Social Agriculture) • Organizing regional farmers markets in the cities • Promoting the establishment of eco-agro tourism • Improves product quality, protects and conserves natural resources such as water, soil and biodiversity Successful examples are long-term organic farms, eco-villages and edibles cities in all federal states of Germany. These give an idea of organic farming as a catalysator for rural development. The contribution will show selected examples of the successful influence of organic farms on rural development in different federal states of Germany.
SESSION 3E

Eco-system Services from Natural Sesources Management

Room: ARISTOTLE

Chair: Kontogeorgos Achilleas
Innovating on agriculture sustainability: Case study of
Lis Valley Irrigation District, Portugal

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Damásio Henrique, Manager of Associação de Regantes e Beneficiários do Vale do Lis
Castro Francisco, Head of Division in Direção Regional de Agricultura e Pescas do Centro
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The innovation of the agricultural systems management is a determinant factor to guarantee the
adaptation to the new paradigm of global economy, environmental protection and social requirements. In
Programs of Operational Groups (OG) (EIP-AGRI, 2015) the definition of innovation criterion was assigned
to the innovation factor the product innovation and process innovation. Product innovation is defined as
the introduction of a new product on the market and process innovation through the implementation of a
new or improved production method, practice or improved process. In the methodology of the global
value of the project were hierarchized several variables. In the variable of the quality of the project plan
and in the area of innovation typology was assigned a higher score for the innovation factor, the product
and process innovation that the project offered. The innovation of the processes, particularly of the
complex systems, like the irrigation districts management, is not always easy to understand and includes
several actors. This paper focus this aspects of the innovation, developing a new process to manage the
water and other factors that requires a set measures interconnected with the collective infrastructures,
aligned with the European Innovation Partnership for Agricultural productivity and Sustainability that
contributed to the European Union’s strategy of research and innovation with the OG Programs 2) The Lis
Valley Irrigation District dated from 1957, managed by the Lis Water Users Association with 2000 ha is a
small but important agricultural area of the Center of Portugal, to grow namely, corn grain, rice,
horticultural crops, orchards, and forage. The national government is planning the rehabilitation of the
water distribution network to reduce the water losses, improve management and the agricultural
competitiveness. 3) An OG has been created to improve: irrigation management, competitiveness and
environmental quality through monitoring and experimentation actions. This project aims an innovation
process following up several advances of knowledge quantified by the network performance indicators,
such as: energy efficiency; irrigation and drainage; water quality; mapping of crops and water use
conditions; economic indicators; operational water demand and distribution plans. It focus is the system
management of water and soil in the plot by the individual farmers, and for the creation of a dynamic
knowledge extension of the association for farmers. The research and experimental tasks are innovative,
highlighting the assessment of ecotoxicological risks and experimentation of mitigation measures by the
farmer; operation of irrigation warnings based on observations and local parameterization; testing and
field evaluation on new irrigation and drainage technologies and their interrelation with the collective
network; remote sensing cultural mapping and its application of irrigation and drainage management;
-economic analysis to assess the viability of technologies and receptivity by farmers. This project
contributes to the rise to products and practices with wide and global dissemination to potential
beneficiary, take in consideration that the agri-food development as economic strategic sector for
Portuguese exports. The agri-food exports grew of 8% (three-year average) higher than Portuguese
exports that grew of 5%. A socio-economic impact that goes to meet the agro-system sustainability.
The assessment of energy and economic potential of crop residues in Italy

Donati Michele, University of Parma
Solazzo Roberto, CREA Research Centre for Agricultural Policies and Bioeconomy

The European Directive 2009/28/EC (Red), on the promotion of the use of energy from renewable sources, states a mandatory target of a 20% share of energy from renewable sources in overall EU energy consumption by 2020. The Directive provides diversified quotas defined on the basis of the specific production potential from renewable sources in each Member State (MS). Each EU MS adopted a specific National Renewable Action Plan (NRAP) showing the measures adopted to achieve the own targets in power, heating and cooling, and transport. In Italy, the target energy share from renewable sources in energy gross final consumption by 2020 is 17%. The development of biomass is at the heart of the European strategy for the achievement of 2020. The potential in terms of energy from agricultural residues relies on the agricultural characteristics of each region and country. Therefore, the assessment of the energy potential of the crop residues should consider the agricultural specificities of each region or country and the variabilities in biomass yield. The aim of this paper is to estimate the energy and economic potential of biomass obtained from a sustainable removal of residues of annual crops in Italy taking account of the variabilities of the available biomass at regional level. The estimation is carried out using the last available National Agricultural Census that provides data on land allocation at municipality level (i.e. NUTS 4 level) and the residue-to-crop ratios provided by ENEA for the main arable crops at province level (i.e. NUTS 3 level). The analysis concerns the territorial variability of the biomass yield, the identification of the main biomass procurement basins and an economic estimation of the energy potential of the agricultural residues. Preliminary results shows that the amount of residues available for energy transformation in Italy is 7.2 million tons of dry matter per year. The regions that contribute the most to this result are: Veneto, Lombardy, Emilia-Romagna, Puglia and Sicily. The amount of power energy that could theoretically be produced is 6,470 GWh per year. This energy is not homogeneously distributed on the Italian territory but it gather mainly around three areas: the Adriatic part of the Po Valley (especially the province of Ferrara), part of central Italy located between Tuscany and Marche, and the Apulia Tableland, mostly in the province of Foggia. The power production from this renewable source could cover 2.2% of the annual national demand. However, in certain regions, as Molise and Basilicata, the production of energy from crop residues would reach 10% of the regional needs.
Carbon and water footprint indices for friendly to environment farming practices in agroforestry

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Kalburjti Kiriaki, Aristotle University of Thessaloniki
Anagnostopoulos Christos, Aristotle University of Thessaloniki
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On a global scale, agriculture is responsible for the 5% of total energy used. Energy currently used for most of the time is not a renewable form, so its use in agricultural production is related to Greenhouse Gas Emissions (GGE). The Paris Convention in 2015 set climate targets. Greenhouse Gas Emissions must be drastically reduced to achieve these targets, so the use of fossil fuels must reduce and agricultural management must change as well. Water is a crucial resource for future agricultural development. The agricultural sector has enormous impacts on water use, water quality and aquatic ecosystems. Based on these facts, it seems that, energy balance, carbon footprint, and water footprint of the agricultural products are very important issues. According to the recent literature, the application of agroforestry systems could play a key role in reducing high inputs of non-renewable energy and GGE in agricultural production, along with better water use, leading to the most minimal influence on climate change. Agroforestry provides assets and income from carbon, wood energy, improved soil fertility and enhancement of local climate conditions; it also provides ecosystem services and reduces human impacts on natural forests. Most of these have direct benefits for local adaptation while contributing to global efforts to control atmospheric greenhouse gas concentrations. Furthermore, Agroforestry was proposed as a measure in the Paris Climate Change Agreement to adverse impacts of climate change and reduce GGE. An energy approach of agroforestry systems’ production is possible based on the conversion of all factors of production and the products of the cultivation. The contribution of this implication is essential as agroforestry ecosystems are recently evaluated with indicators based on energy balances, biodiversity, GGE and the water footprint of the agricultural products. A methodological scheme could be implemented using an adjusted to agriculture Life Cycle Assessment (LCA) method to determine energy indices, GGE and Water consumption of Agroforestry.
An Investigation of Members’ Commitment in a Greek Poultry Cooperative

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Poultry sector in Greece is one of the most dynamic sectors of animal production and rural economy. It is an interesting fact that the poultry sector in Greece counts no more than 10 vertical intergraded poultry companies that hold about 80% of the market share. In addition, 4 of the largest companies hold about 60% of the total market share and 2 of the 4 largest poultry companies are agricultural cooperatives. Having loyal members is directly associated with cooperatives economic performance and is crucial for the success of the agricultural cooperatives. However, decreasing member loyalty is a problem for many agricultural cooperatives. The foundations of loyalty to a cooperative are trust and commitment and are of the utmost importance for development of the cooperatives, since they determine not only the short-term success of the group but also its long-term sustainability. The purpose of this paper is to explore aspects of trust and commitment among the members of a successful and profitable cooperative. For this reason, a questionnaire was developed and distributed among the members of the largest poultry cooperative in Greece. The main objectives of this paper are to investigate the characteristics of the farmers according to their perceptions about trust and commitment to their cooperative and to identify what make them loyal (or not) in their poultry Cooperative. The results of almost 250 questionnaires indicate higher rates of participation and commitment compared to other agricultural cooperatives in Greece and in general a reciprocal behavior among the poultry cooperative members. Key words: Greece, Poultry Cooperatives, Commitment, agency problems, factor analysis.
Friday, 07 September 2018

SESSION 4A

Social, Ecological and Economic Benefits associated to farming practices

Room: PYTHAGORAS

Chair: Turk Jernej
Ecological and economic effects of changes in field size and green infrastructure in agricultural landscapes

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Changes in the size of agricultural fields have accompanied technological and socio-economic development in agricultural landscapes for centuries. From a farm economic perspective, an increase in field size increases efficiency, leading to lower production costs per hectare land. The increases in field size are not only associated with direct economic effects, but have been suggested to decrease biodiversity, and ecosystem services to crops, for example by reducing resources for wild pollinators. Furthermore, there is overwhelming evidence for the importance of the configuration and composition of farmland mosaics for biodiversity and ecosystem services. Although being of major importance in agropolitics and sustainable agro-food-chains, these ecological-economic effects have received little attention in the scientific literature. In particular, joint ecological-economic studies, critically important to inform policymakers, conservationists, producers and consumers seeking to combine agricultural production, an improved flow of ecosystem services and biodiversity conservation, are currently lacking. With our study we contribute to filling of these knowledge gaps by assessing the economic and ecological effects of increasing field size and decreasing the area dedicated to permanent field edges. In order to do so, we develop an ecological-economic simulation-based land-use model. Our model is subdivided into five sub-models: land use model, pollination model, yield model, economic model and biodiversity model. This allows us to take into account the direct effects of field size changes on gross margins and biodiversity, as well as the indirect effect on crop production though loss of crop pollination services by wild bees that depend on permanent habitat. We base our analysis on IACS and soil quality data for 13 2x2 km square study landscapes the region around Würzburg in Bavaria. For each of these landscapes we compare different scenarios with small vs. large field sizes as well as a tight vs. wide mesh of permanent field edges. The first results show a substantial increase in total gross margin per landscape and gross margin per hectare arable land when the landscape is changed from the baseline (small fields, high permanent edge density) to the most homogenized scenario (large fields, no permanent edges). Disentangling the direct and indirect contributions, we show that the high positive effect on farm economics through an increase in field size cannot be overcome by the small negative effects of reduction in permanent field edges and associated ecosystem services. Furthermore we find a large decrease of biodiversity when field size is increased. We conclude that, due to possible enhancement of farm economics, a further increase of field size under similar conditions to our study region is likely to happen. But this will also continue the existing trend of declines in biodiversity. Conversely, our study suggests that reducing or maintaining field sizes to mitigate biodiversity declines in farmland would be associated with significant costs. Therefore it would be necessary to introduce appropriate economic incentives like consumer supported bee conservation programmes along the agro-food-chain.
Environmental productivity change in a state-contingent approach to farming practices

Iliakis Konstantinos, University of Reading
Gadanakis Yiorgos, University of Reading
Park Julian, University of Reading

Moving forward, agricultural policy aims to enhance the provision of ecosystem services with targeted incentives and environmental regulation that ensures sustainable productive competitiveness. A major challenge of this process is to quantify farmers’ effectiveness in diversifying income in rural development and maintaining their agricultural productivity. Key elements are the differences in their varying adjustment costs traced either to farm specific characteristics or the production environment under which they operate. Furthermore, farming practices that relate to the use of land and crop management can exacerbate the effect of inappropriate use of inputs or primary resources inherently by affecting the productive environment and the farmer’s ability to catch up. Through a dynamic approach that accounts for changes in both in the quality of intermediate inputs, the sustainable managerial capability and the terms of production, productivity change is decomposed to evaluate change. Using the frontier methodology in a state-contingent framework we evaluate firstly the degree to which uncertainty influences farmers’ in allocating efficiently resources between farming activities and secondly whether diversified sources of income allowed them to effectively maintain their competitiveness. This analysis is not limited to an assessment of the trade-offs in changes of the agricultural productivity but instead illustrates the effects of simultaneous technologies on the stability and performance of the farms within a rural ecosystem.
Farm size and farmers' environmental-friendly practices

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Agriculture is among the major contributors to climate change, accounting for 24 percent of global CO2 emissions. Within the agricultural sector, livestock has a major role in greenhouse gas emissions. However, animal husbandry also affects the environment through nitrogen leaching to water tables from manure and slurry spread or stored on the soil. Both impacts can be diminished by appropriate practices, concerning the effluents storage and the modalities of their spreading on the soil. We investigated to what extent farmers adopt such practices and, more importantly, which are farm and farmers' characteristics more conducive to their adoption. This could help in designing and fine-tuning policies addressed to a larger implementation of environmentally friendly practices. In particular, there is a discussion in the political field on whether large or small farms are more environmentally friendly. Within this framework, and given the predominance of small farms in Italian agriculture, we especially assessed the effect of farm size on the adoption of appropriate practices. To this purpose, we estimated ordered and binomial probit models of the adoption of virtuous practices from data of the 2010 Agricultural Census in Piedmont (Italy). Focussing the attention on the cattle sector, production (milk or meat), housing systems (tied stall or pen), kind of manure (solid or liquid), storage facilities (in field, on pad or tank uncovered or covered) and spreading systems (on soil without incorporation, with soil incorporation and in bands, injection or fertigation) were taken into account to correlate the more environmental friendly practices to the farm and farmers' characteristics. The results suggest that, in general, larger farms (both in terms of farm turnover and in terms of herd size) are more likely to adopt virtuous practices. However, the effect of farm size is, in all cases considered, rather weak. Probably due to due to economies of scale, farm or herd size counts, but apparently it does not make a substantial difference in the probability of adopting environmentally friendly practices. Location in the mountains or hills is less conducive to virtuous practices, possibly due to technical and cost issues linked to the difficult physical conditions (e.g. higher costs of building storage plants and to spread animal effluents). As regards farmers' characteristics, some virtuous practices are more adopted by young and educated farmers. Nevertheless, this does not apply to all practices and, in general, the outcomes of the analysis of personal characteristics are somehow puzzling. These results suggest that probably much of the variation is due to idiosyncratic and non-observable characteristics of farmers. The policy implications of our outcomes are that, if the adoption of these practices is desirable, the public effort should be directed to overcome the major difficulties, linked to the technical costs of plants and machinery. Hence, subsidies in this direction should be modulated favouring small farms and farms in unfavourable physical conditions.
The main objective of this paper is to analyse the socio-economic impact of rural investments from the government of Kosovo and remittances from diaspora in Kosovo. Kosovo is a small country largely a rural country with poor rural infrastructure where is also known to have an outstandingly high level of migration, this study will analyses the impact of remittances in rural economy, positive effects may arise from remittances if they are invested in the rural economy, also we will analyze the government investments on rural infrastructure in preventing the migration and creating a better socio economic living conditions for the rural population in Kosovo. However, there may also be negative effects, the age structure, low level of investments when in particular the young population is leaving might slow down development induced by problematic dependency relationships. We also argue remittances as a financial support in growing the rural economy potential in Kosovo, where jointly with governmental program for rural development might succeed improving the economic situation in the rural Kosovo. We will further shed light on the remittances sent by migrants, although understanding the reasons behind where they are mostly possible in sending sectors, such as for schooling, poverty reducing, family welfare, investing in rural sector, diversification of investment activities, proper use rational rural resources, we will try to link the investments also from the government in support to remittances in creating the better conditions for a business activities where people can have their households sustainable and bringing a positive socioeconomic behavior in those rural areas in Kosovo. Key words: Migration, remittances, rural household, poverty, income generation, rural investment
An overlook of the economic benefits of value-based food chains to maintain farms operating in Less Favoured Areas

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Itskovich Aleksander, Volgograd State Agrarian University
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The aims of this paper go in the way to collect and demonstrate the positive economic influences/effects of value-based food chains (known as food chains with added values) on social and economic situation of farms. Especially this type of food chains can be recognized as very important factors for preserving the sustainable development of small farms located on hilly and mountain regions as well as on others less favoured areas. The result are based on the analysing of value-based food chain from Slovenian mountain regions. Added values manifest through several economic parameters while the most important is the highest purchase prices of agricultural raw material. From the first case study the elasticity values were calculated for purchase prices of raw milk as indicator to recognize the potential economic benefits. Authors have chosen two different methodological approaches for this study. Both of them are based on the empirical mathematical approach (econometric analysis).
SESSION 4B

Food products competitiveness and their role to rural development

Room: SOCRATES

Chair: Donati Michele
Ago-insurance as an instrument for business continuity in Ukraine

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Zhemoyda Oleksandr, The National University of Life and Environmental Sciences of Ukraine  
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Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity and feed 9 billion people by 2050. Growth in the agriculture sector is about two to four times more effective in raising incomes among the poorest compared to other sectors. This is important for 78% of the world’s poor who live in rural areas and depend largely on farming to make a living. One of the major risk in agriculture is weather, and due to latest climate change trends, the number of weather related catastrophes increase from to year. Agriculture insurance – is a form of risk management used to hedge against a contingent loss that provides a way of protecting farmers against these risks. The conventional definition is the equitable transfer of a risk of loss from one entity to another in exchange for a premium or a guaranteed and quantifiable small loss to prevent a large and possibly devastating loss. Agricultural insurance is a special line of property insurance applied to agricultural firms. In recognition of the specialized nature of this type of insurance, insurance companies operating in the market either have dedicated agribusiness units or outsource the underwriting to agencies that specialize in it. To build a sustainable agriculture insurance system, the country requires a strong enabling environment. An enabling environment consists of legislation that enables agriculture insurance, and good regulation, that ensures the quality of agriculture insurance for farmers, creditors, and insurance companies. In Ukraine in 2012 new legislation for agri-insurance development was adopted, but no subsidies for farmers (financial support) was allocated. Compared to other types of insurance, agriculture insurance remains very risky and that is the main reason for this type not being widespread in Ukrainian insurance market. Figures in agriculture insurance are very low: in 2017: insurance companies issued 957 contracts, resulting in $7.5 M USD of premiums collected, which is 30% more than last year. In 2017 the sum insured (total insurance liabilities) reached $223 M USD and the total acreage of 657,100 hectares. Regarding complexity of agro insurance single insurance company not capable to design insurance products due to lack of expertise, data and good quality international reinsurance. How cooperation between insurers, suppliers and banks can become an instrument for business continuity for farmers?
Traceability in fresh fruits and vegetables exports: 

case of Antalya/Turkey

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Ozkan Burhan, Akdeniz University

Ceylan Rahmiye Figen, Akdeniz University

Traceability of agricultural consumables is important for human health and food safety. Labelling is the most significant application for tracing exportable Fresh Fruits and Vegetables (FFVs) in Turkey. With labelling, it becomes possible to follow up the process with regards to producer, method of production and all the path until the product reaches the final consumer. With this ease, it also becomes possible to cope with any problem encountered during the journey of product from producer to consumer and develop alternative solutions for different problems. Accordingly, importers have the opportunity to grant food safety in their trade and securing imported food supplies. With this study, it was aimed to undermine the factors affecting traceability of FFVs exported in Antalya, Turkey. Antalya is the most prominent agricultural producer and exporter province of Turkey. The data retrieved from 120 tomato, fresh pepper and pomegranate exporter firms, those who have trade contracts with the EU countries, via face to face survey. The survey data will be analysed econometrically, with the methodology that will be decided upon due to data characteristics, to undermine the effective factors. The main drivers of traceability of exportable FFVs will be analysed in the scope of the variation in tracing methods and problems encountered during the process. In addition, the legal base of traceability in Turkey will be assessed shortly to estimate the future application requirements for exports of FFVs. Keywords: fresh fruit and vegetables, exporter, Turkey, traceability, food security
Export competitiveness of Food Industry in Kosovo

Halimi Kapllan, PhD Candidate, Leibnitz Institute for Economic Development in Transition Economies, IAMO, Halle (Saale), Germany

The output of food processing sector has sustainable traditions and presence in the trade balances in Kosovo. The agri-food sector in Kosovo is an export-focused sector, with bulk unprocessed agri-food exports of the farm gate value of agricultural production, and semi-processed and consumer-ready exports. Viability and growth depends on being competitive in international markets. This is not a choice, but a requirement. The competitiveness of the food sector, with its smaller scale of operations and critical mass issues, affects the competitiveness of the agri-food supply chains in export markets, as do the size of the domestic market and costs of major non-farm inputs. Overall productivity is another important determinant of competitiveness. Data indicate that in both countries food manufacturing operations contribute a lower percentage of value-added expenditures to R&D than their major international competitors. Kosovo has competed primarily on a low-cost basis and availability of resources. Kosovo differentiates its product offerings into higher value markets to address ongoing challenges, a focus on innovation is needed in order to support competitive positioning strategies. The basic hypothesis of scientific research is that: food production, as a combination of different productions and products, and individual groups of products that have comparative advantages and export competitiveness on the international market. The assumed hypothesis can be verified, respectively accept or reject, in pursuit of the following principal objectives and sub-objectives. The main objective is to examine the state and the changes in the export competitiveness of the food processing industry. As a result of this objective, development trends can be developed and policy and action scenarios developed. The main objective is decomposed into the following sub-objectives: 1. To conduct a study on the methodology for assessing export competitiveness in a dynamic market environment. 2. To select an approach to assess the export competitiveness of the food industry. 3. Identify and analyze factors influencing export competitiveness. 4. Evolve trends and directions for future development.
The food supply chain as innovative approach for the development of rural area: the case of Basilicata region

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Basilicata is a rural region of southern Italy. Its territory covers 10,073.32 square kilometers. It is almost entirely mountainous or hilly and characterized by the presence of natural habitats and agricultural landscapes of great value affected by abandonment processes. Agriculture plays a fundamental role in the regional economy, so the sustainable rural development becomes a priority for environmental protection and social growth. In the 2007/2013 programming period, the Basilicata region has embarked on territorial development paths to deal with some of the structural and economic aspects of the agricultural and rural situation of Basilicata in an organic and effective manner. The Integrated Supply Chain Planning (PIF) encourages the aggregation and qualification of the offer, the transfer of innovations and the use of specialized services (technical advice, training). At the same time, it contributes to the protection of natural resources and agrarian and rural landscape. The National Strategic Plan (NSP) identified supply chain value as a qualifying element for the 2007-2013 programming period. In order to address some of the structural and economic aspects of rural and agricultural Lucania, the Region has focused on the Integrated Supply Chain Project (ISCP), recognizing that the agricultural sector has a strategic role in helping to relaunch the territory. The main objectives of the 2007/2013 Basilicata Rural Development Program are to consolidate aggregation, improve co-operation between main participants, rationalize economic activities, encourage concentration of production, increase competition and promote typical traditional foods. The Basilicata Region, with the technical support of CREA (Basilicata Political-Bio-economics), has analyzed the Lucanian agricultural situation in general, and in particular its productive sectors, and plans to implement intense consultation activities to stimulate the involvement of regional participants. The ISCP call for proposal has allowed a large number of highly-affected companies to work in partnership and share planned paths to new markets or to substantial economic development in the agricultural world. This paper shows the results of monitoring ISCP and highlights how ISCPs favored the transition towards a sustainable model of rural development characterized by the diffusion of innovative and sustainable technologies and practices adapted to local needs. They have been perceived as a great opportunity to overcome the critical issues related to individualistic attitudes, to enhance the quality of products. At the same time, the results highlighted some current issues, including recommendations for change and future issues in view of the new 2014-2020 programming.
Energy inputs, greenhouse structures and crop yield relationship in greenhouse pepper production

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Ozkan Burhan, Akdeniz University
Ceylan Rahmiye Figen, Akdeniz University

Agricultural input requirements and use density vary for different structural instalments. When greenhouse production, with high value-added and export advantages, is considered the structural differences result in more variation in energy and input use. The aim of this study is to compare and evaluate energy requirements and input use differentials for glass and plastic houses for Kumluca town of Antalya. Kumluca is well known with widespread greenhouse production, which enables overcoming climatic distractors and high agricultural value added. The data used in this study were based on cross-sectional data collected from greenhouse operators by using a face to face survey. The Cobb-Douglas production function was developed to estimate the impact of energy inputs on yield and determine the differences and contribute in investment decisions of greenhouse producers. Key-words: greenhouse, energy, pepper, production, Turkey.
SESSION 4C
Sustainability of Agro-food Chains

Room: DEMOCRITUS

Chair: Giray F. Handan
Dealing with the variability and heterogeneity of quality within sustainable fruit-based supply chains

Pavez Iciar, INRA, UMR MOISA
Bouhsina Zouhair, INRA, UMR MOISA

Agricultural supply chains are providers and receivers of ecosystem services. Providers when supplying food, non-food products and services; and receivers as they benefit from natural resources (Le Roux et al., 2008). Agriculture and its supply chains must be considered as social-ecological systems due to the participation of different actors that interact within natural, economic, institutional and social dimensions (Moraine et al., 2015). Partners within the supply chains coordinate to organize exchanges while managing the natural resources and adapting to changes and uncertainties, whether linked to natural or to economic factors. This study focuses the analysis on two fruit-based food supply chains: apples and mangoes, particularly at the interface between agricultural raw materials and processing. Supply chains of fruits are especially complex. At the production stage, climate, i.e. sunlight, temperature, humidity among other agronomical factors, are source of variability and heterogeneity of the raw material. Beside the influence of climate on the quality attributes of fruit, climate also affects the apparition of plant diseases, which on one hand, have direct and harmful effects on fruit quality, and on the other, trigger the use of phytosanitary substances to control pests with the consequently emergence of chemical hazards due to residues in fruits. This complexity makes more difficult for growers and processors to control the food quality which is increasingly relevant and demanding. Quality has evolved towards a more comprehensive concept that beyond the organoleptic and nutritional attributes, involve the respect for sanitary, social and ecological considerations. Firms, i.e. growers, processors, traders and distributors of the supply chains, have the responsibility to satisfy consumer, to protect human health and to protect natural resources. Firms have also the challenge of ensuring their own position in a highly competitive and uncertain environment. To do so, they implement strategies to control quality and to protect assets involved in transactions with partners that can also be competitors (Menard, 2013:130). This study asks the question: How do firms manage the variability and the heterogeneity of fruits within the supply chains? To answer this question, our framework is the New Institutional Economics. We resort to the institutional analysis applied to the agricultural sector by Menard (2013, 2014), that allows studying the existence of simultaneous and different modes of governance within the commercial activity and to have a better understanding of the multilayer institutions in place to regulate the social-ecosystems. Using a qualitative method of analysis, we gathered primary information from 34 firms with a main focus on France for apples and mangoes (La Reunion), we also explored other European, Asian and Latin-American countries to have a wider scope of analysis and comparison. We uncover the main problems concerning quality of products, and the strategies of coordination adopted by firms within the supply chains. The complexity of global supply chains leads to the emergence of (also) plural forms of governance. These forms of governance occur simultaneously as a strategy to improve positioning, to balance risks of these agricultural transactions, and to better comply with health, social and ecological objectives.
Applying Transaction Cost Analysis to Solidarity-based Food Systems in Germany

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Bitsch Vera, Chair of Economics of Horticulture and Landscaping - Technische Universität München

Consumer concerns about negative social and ecological effects of global food production and distribution systems have not been allayed by existing solutions such as commercial organic production and certification systems. Producers of agricultural products are increasingly unable to self-sustain and still provide the quality of products demanded of them. In response, alternatives to prevailing market structures, such as regional consumer-producer cooperatives began to form in the 1980s in Europe. More recent alternatives are commonly referred to as solidarity-based food systems (SFS), one of which is known internationally as community supported agriculture (CSA). In 2011, a network of CSAs in Germany formed under the legally protected name Solidarische Landwirtschaft (Solawi). A set of eight statutes to which Solawis must adhere are designed to promote and preserve solidarity through requirements for sharing financial risk and responsibility and distributing generated value equally. Relationships between consumers and producers based on trust and communication are developed through a system of transparent co-financing of farm operations, reciprocated with an equal share in the harvest. Statutes requiring members to collectively choose production methods that protect water, soil and other natural resources demonstrate solidarity with nonparticipants. As the network does not prescribe specific formal structures, each Solawi creates its own set of governing rules and financial arrangements. The analysis presented here examines the institutional arrangements individual Solawis have created to fit the unique human and natural resources at their disposal, while preserving the solidarity principles. Grounded Theory methods are employed to analyze in-depth interviews with producers and consumers active in individual Solawis and key actors in the Solawi network. Additional data sources include membership agreements (contracts), websites, participant observation conducted at meetings of the Solawi network and individual Solawis, as well as self-descriptions of 25 individual Solawis located across Germany. After initial concept development, transaction cost economics (TCE) concepts are evaluated in terms of their power to explain the choice to participate in Solawi. Solawi producers and consumers in Germany vary widely in the motives and circumstances behind the choice to participate. The institutional arrangements that govern Solawi enterprises, such as legal business form and decision-making rules are equally heterogeneous. This variance reflects the personal attributes of the individuals involved, such as value systems and communication skills, as well as the socioeconomic and biophysical realities of the areas in which particular initiatives operate and the products they produce. In all Solawis analyzed, consuming members’ sign contracts in which they commit to a set monthly payment for a minimum of one season, independent of the amount of product they receive. Producers commit to using those resources to provide as much product as they can that meets the specific requirements of Solawi members. Hence, credible commitments, dealing with uncertainty, frequency of interaction, and asset specificity are all relevant concepts from TCE. However, as Solawis have the specific goal of financing farm operations rather than facilitating exchange of product for profit, TCE’s emphasis on economizing individual transactions limits its explanatory power.
The short food supply chain as a strategy to move towards an alternative sustainable agri-food system: the case of PDO Parmigiano Reggiano cheese

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Biasini Beatrice, Department of Food and Drug
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Provided Food Supply Chains (FSCs) can be defined as the “network of food-related business enterprises by means of which food products move from production to consumption, including pre-production and post consumption activities” (Kader, 2002: 283), Short Food Supply Chains (SFSCs) are characterised by a reduced number of transaction along the food supply chain and by a limited distance between production and consumption of the food product (Bazzani and Canavari, 2013). The literature has stressed several interpretations and implications of this definition which have recently evolved in the European Parliament and Council Regulation (EU) No 1303/2013 (i.e., European Rural Development Regulation), which defines a SFSC a “supply chain involving a limited number of economic operators, committed to co-operation, local economic development, and close geographical and social relations between producers, processors and consumers” (EIP-AGRI, 2015:5). Comprising the role of, and relationship among, producers, consumers and the territory, this definition characterises SFSCs as agri-food systems which may be inherently more economically, environmentally and socially sustainable than globalised agri-food systems characterised by Long Food Supply Chains (LFSCs). The main objective of this contribution is to assess the sustainability of the SFSC of the Protected Denomination of Origin (PDO) product Parmigiano Reggiano cheese, as well as of its “overall” impact on the rural territory. The motivations of consumer participation in the Parmigiano Reggiano SFSC are surveyed with roughly 60 interviews carried out over the autumn 2017, while those of 20 farmers producing milk for both the short and long supply chain are assessed with a quantitative questionnaire which informs the calculation of a set of indicators for the economic (e.g. gross value added, price premia, gross margin distribution, reputational value, employment), environmental (captured by lifecycle analysis and carbon footprint calculations) and social (gender equality, social capital and territorial cohesion) sustainability of producing for the Parmigiano Reggiano cheese. The contribution makes use also of more qualitative research in the form of semi-structured in-depth interviews undertaken with producers, organisers and consumers participating in the SFSC of the Parmigiano Reggiano to explore the motives, benefits and hurdles in participating in these SFSCs.
Food chain sustainability and innovation options

Sánchez Mercedes, Public University of Navarra
Pindado Emilio, Public University of Navarra

The paper explains the interest of the different members of food-chain in the introduction of sustainable innovation options. Concretely, it has been selected some agricultural and food producers from Spain to compare the employment of different inputs and outputs of sustainability innovation. The main databases selected are the Survey on Corporate Strategies (2010-2015) for food producers and ad-hoc survey to farm producers. The sequential regression models are selected to estimate the relationship between the decision of incorporate environmental protection innovation options and individual (size, activity, economic performance, R&D effort, open innovation activities, across others) and structural variables (regional innovation effort and environmental regional protection) of the business. Additionally, the differences across technological (product and process) and non-technological (organizational and commercial) output innovations are explained to agri-food firms. It is expected one positive and relevant change into the attitude of the firms to environmental protection in the last years, in the both agro-food chain components. The higher implementation of the environmental actions is linked to the cost reduction, especially in the large agri-food firms.
How to conceptualize agro-food supply chains: an analytical framework for sustainability

Giray F. Handan, Suleyman Demirel University
Tarakçıoğlu Mehmet, Ministry of Development

Consumer’s attachments to origin of foods regarding the way and place they are produced in addition to traceability has increased with rapid urbanization. The labelling and quality regulations on local, traditional/regional, direct sale, short food supply chain, and geographical indications foods are now part of the food policy. However, the relationships between increases in human population and growing demand for food and ecosystem services such as food and clean water makes the issue to be considered by different policies interrelatedly. This interrelation makes the policies important tools both for governments to challenge the deindustrialization and depopulation trends in rural areas and forces them improving the management of ecosystems to ensure their preserving and sustainable use, while firm level strategies (environmentally friendly production, globalization, localization, glocalization) also influence upon these changes and affected by. This situation, also affects the analysis approaches of the agricultural and food studies; chains with the same terms of name could have different problem objectives and diverse analysis approaches. In this study, we discuss a conceptual and analytical framework with main drivers undertakes to get an assessment basis for further discussion. At the end, it discusses the sustainability dynamics of interaction of agro-food supply chains and markets and lays down policy recommendations. Keywords: Food Policy, Healthy Food, Quality Food, Ecosystem Services, Agro-Food Supply Chain, Sustainability, Rural Development
SESSION 4D

Food Chain and eco-system services

Room: THEOFRASTUS

Chair: Scoppola Margherita
Food Chains and Ecosystem Services through a Resilience Lens

Salvia Rosanna, University of Basilicata
Quaranta Giovanni, University of Basilicata

Agri-food systems are strongly interconnected with society, the economy, culture, politics and ecosystems. Chains of food production and distribution are examples of man-driven dynamic systems that depend on the environment, ecosystems and social institutions. As such they can be defined as coupled social- ecological system (SES). The actors in the food system (farmers, processing, distribution and retail industries, consumers), take decisions that feed back into the food characteristics and modes in which it is processed and consumed. The actors also have an impact on how the different components of the food chain are organized. Global environmental changes, population growth and the need for increased production of food, goods, services and energy (albeit in a sustainable way), are shaping the way in which socio-ecological systems maintain and adapt their functions. The complex dynamics of food systems must be observed and understood because they have an impact on global and local environmental sustainability and food security. In the light of global warming and limited natural resources, it is imperative to build resilient food systems that ensure food security and the integrity of the ecosystems in which they are rooted. Resilience is the ability of a system to maintain its structure and functions and to reorganize itself in the face of the disturbance. Adopting resilience thinking, this paper aims to analyze the dynamics of a food chain over a long period of time that has been characterized by profound transformations. The paper focuses on the analysis of olive oil, a typical Mediterranean supply chain and on the evolutionary dynamics that have taken place in the different components of the SES, as well as changes to the SES itself in response to internal and external stresses. The research considers the 60-year period from 1950 to 2017 and the olive oil supply chain in the Alento socio-ecological system (Southern Italy) in three separate periods: i) migration and imperative of efficiency (transition); ii) local off-site jobs (stable period) and iii) land abandonment (seemingly in transition). The evolution of resilience in the olive oil supply chain, is considered as the local response to macro, meso and micro-scale events. It is analyzed in relation to trends in specific ecosystem services (ES), in particular protection against natural hazards (soil erosion, landslides, floods) and cultural ecosystem services (recreation, tourism and aesthetic values). The properties of the agro-food social ecological system that have played the most significant role are potential for change, robustness, diversity, redundancy, connectedness, modularity, and openness.

Key words: Food System, Socio Ecological Systems, Ecosystem Services, Resilience
Reconfiguring household management in times of discontinuity: Towards Eco2 ecosystemic-economics in agro-food chains

Sajeva Maurizio, Pellervo Economic Research
Mitchell Andrew, De Montfort University
Lemon Mark, De Montfort University

The increasing uncertainty, climatic changes, shifts in the geopolitical tectonic plates and complex system dynamics of the age of the Anthropocene, suggest that the way we do, and conceptualise, business must also change to accommodate an approach informed by post-normal scientific insights and practices. As a significant driver in human affairs and a critical determinant in the socio-political response to climate change, there is a need for a critical re-evaluation of the economy. Although considerable work since the 1980s has attempted to reconfigure how the science of economics is conceptualised and realised in practice, it is apparent that these efforts have, at best, resulted only in peripheral tweaks in the relationship with social-ecological systems. In this article, we lend our voices to advance the call for modern neo-liberal economics to be reconfigured in ways consistent with the original meaning of the word ‘economics’, οἰκονομία (oikonomia), or ‘household management’, later developed as the effective management and allocation of resources for meeting human needs. Having become subverted by its Cyclopean attention to profit making and maximization, we suggest that economics is no longer able to effectively manage the (global) household but is instead responsible for directly and significantly contributing to its deterioration. One re-imagining of the economic model was a holistic and systemic evaluation of agri-food systems’ sustainability that was performed through the multi-dimensional Governance Assessment Matrix Exercise (GAME). This was based on the five capitals model of sustainability, and the translation of qualitative evaluations into quantitative scores. However, translating how the management and accounting for changes in environmental capital interacts with, and influences, changes in social and human capitals and how these in turn translate into manufactured and financial capital remains a qualitative evaluation. To represent quantitative interactions, this paper integrates the GAME with a post-normal, ecological accounting method. Emergy is a unifying concept that provides an integrated, scalable and multidimensional metric based on the donor-side economic perspective where value is adduced through the amount of effort (work done) invested in a given process, element or system. By utilizing the common denominator of solar emJoules (seJ) the contributed efforts of solar, tidal and geothermal energies in the production and maintenance of an ecosystem biome may be assessed on a common basis. Emergy connects some currently disparate research agendas to a shared value framework through the use of a common unit (the seJ), to align modern economics with the household it is intended to manage, rather than continuing to work at odds with it. The revised GAME re-imagines economics as no longer the ‘dismal science’, but as one that has potential leverage for positive, adaptive and sustainable ecosystemic analyses and global ‘household’ management. This paper proposes an explicit recognition of economics as nested within the social spheres of human and social capital which are in turn nested within the ecological capital upon which all life rests and is truly the bottom line.
Are Geographical Indication Products fostering Public Goods? Some evidence from Europe

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Since the first European involvement in protecting products of geographical indications (PGI) and designations of origin (PDO) (Council Regulation (EEC) No 2081/92), the economic impact of these quality schemes has been analyzed several times. The studies could be grouped following different taxonomic criteria, which can be outlined according to the methods adopted (Paus and Reviron, 2011) or to the subjects observed. Restricting the attention on the latter, the main research line is the one on consumer behavior (Grunert, 2005; Verbeke et al., 2012). On the other hand, another approach investigates the production aspect through analysis on the producers’ price premium (Desbois and Néfussi, 2007) and added value (Barjolle et al., 2007) or the costs of using a Geographical Indication (GI) (Belletti et al., 2006). Furthermore, other scholars explored the supply-chains and their managerial features (Barjolle and Sylvander, 1999). Besides these approaches, some academics have introduced a broader analysis which stresses the influence of GIs as a tool for rural development and as an engine in promoting public goods (PG) (Pascual et al., 2011). In these framework also social, cultural and environmental features gain significance. The turn in taking into consideration these aspects could be detected also in the FAO intents (Vandecandelaere et al., 2009), well expressed with the SAFA index conceptualization. Notwithstanding empirical studies exploring these fields are rare (Belletti et al., 2017). The aim of this presentation is to assess the degree of GI-involvement in generating some specific pure and local pure PGs (classification: OECD, 2001): cultural aspects, landscape maintenance, natural resources impact and animal welfare. The novelty lies in the fact that the objective will be pursued with an empirical analysis. This work will be carried on through a qualitative methodology: a survey will be addressed to a sample of 30 case studies (different European Regions and different product classes), more precisely to the objects of the research project Strength to Food. Thanks to the heterogeneity of the case studies, the results of the contribution of GI in fostering the PG facets could be compared applying different criteria. It could be detected if there is any difference between the role played by the PDO and by the PGI products. Alternatively, the evaluation could move on from a geographical perspective (which could, in some case, imply a political correlation). Moreover it could be possible to identify which PGs benefit more from the presence of a GI. Different aggregation criteria and hypothesis could be set, according to the collected data, in order to achieve a first evidence from the empiric observation on a European scale.
Setting effective and functional, SDG-consistent, transformational pathways for agro-food chains using a flexible multi-objective, stakeholder-participatory backcasting approach

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The United Nations (UN) chose Uruguay as the first case study for implementing a new set of post-2015 Sustainable Development Goals (SDGs), under the Sustainable Agriculture & Food Systems (SAFS) thematic network of the Sustainable Development Solutions Network (SDSN), and the support of the Institut du Développement Durable et des Relations Internationals (IDDRI). In 2006, the international team in charge of the initiative issued the first report with the Agricultural Transformation Pathways (ATP) for Uruguay and the other two selected study cases: U.K. and China. The methodological approach was inspired in a previous work coordinated by SDSN and IDDRI. Used for the first time at country-level, this approach recognizes two main pillars: (i) strong commitment and active participation of key stakeholders from both public and private sectors; (ii) step-by-step “backcasting” method. The first pillar put special emphasis on the participatory building of pathways by stakeholders and experts already involved in the national policy debate. It includes key stakeholders from academic institutions, industry associations, farmer organizations, civil society, and government. The objective is achieving three goals: (i) bring knowledge to the project by consulting national experts and practitioners; (ii) foster policy debates on the important issues facing the country; and (iii) generate buy-in among stakeholders, which is fundamental to overcome a number of sociological and political roadblocks to transition. The second pillar involves the so-called “backcasting” approach for “building a vision of the future we want”. It denotes a process in which a desired target is set for a future date, and then identifies the best pathway towards achieving that target by moving backward in time. A specific challenge when building pathways for the agro-food sector is that sustainable agricultural transformation must take into account and prioritize a raft of targets. Win-win solutions may not exist for some agriculture-related targets, and trade-offs are therefore to be expected. Effective and functional sustainable development pathways for agro-food systems can only result from a political choice concerning these trade-offs and priorities; it needs to be debated and decided at the national or local scale, taking into account the specific conditions of countries and regions. In this paper, we present useful evidence and learned lessons emerged from the Uruguay case. We focus on the empirical construction of ATPs consistent with the SDGs for two contrasting agro-food chains included in the study: beef and rice. A reduced number of well-organized high-technology farmers and millers comprises Uruguay rice chain. Both parties have a history of integrated work in many aspects of the production system, which made possible developing an ATP without any public intervention. On the other hand, the Uruguayan beef sector includes a large number of cattlemen, slaughter and packing plants lacking any associative culture. Thus, setting an effective ATP was a more complex task, requiring an important effort of academy and public authorities in creating the incentives to bring all private stakeholders to a minimum necessary degree of commitment.
Enhancing sunflower value chain for rural economy in Tanzania: A village computable general equilibrium-CGE Approach

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Sieber Stefan, Leibniz Centre for Agricultural Landscape Research (ZALF), e. V
Müller Klaus, Leibniz Centre for Agricultural Landscape Research (ZALF), e. V

Proportionally, in Tanzania, the agricultural sector accounts for about 29% of GDP, employs 65% of the workforce, and generates more than 80% of the total export earnings. Around 28.2% of the households living below the poverty line are rural households where the main income activity is small-scale agriculture. Intervention leading to generation of employment and access to income is crucial for ensuring food access, and for the poor this is even more crucial, as their labor is often the main asset that they can rely upon for income generation. Hence, developing pathways for securing food and agricultural products value chains in Tanzania provide potential intervention points. Income alternatives to stabilize livelihoods, such as enhancing sunflower value chain, is deemed vital given that food security will not be negatively affected. This study uses a village computable general equilibrium (CGE) approach to assess the welfare effects of sunflower value chain upgrading strategies on employment and income for rural economy in Tanzania. To assess the effects of sunflower value chain upgrading strategies, we construct a village CGE for Idifu village in Dodoma, Tanzania where sunflower value chain upgrading strategies have been implemented by a Trans-Sec project. Results indicate that enhancing the sunflower value chain by increasing the output, introducing value addition through processing and linking sunflower farmers to markets has positive effects in terms of employment, income and household consumption. Consequently, we argue the government and other development practitioners in Tanzania to promote initiatives geared toward enhancing crops value chains which would lead to income generation and improve farmer household’s consumption in rural setting.
SESSION 4E
Climate Change and Agricultural Ecosystem Services

Room: ARISTOTLE

Chair: Heinschink Karin
The Economics of Climate Change in Agriculture: A Review on Kazakhstan and Turkey

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Engindeniz Sait, Ege University

At the end of the XX - beginning of the XXI century there are global processes of climate change under the influence of anthropogenic factors, the preservation of these trends will entail extreme and almost irreversible consequences. It is obvious that climate change affects agricultural production and its productivity throughout the world. The climate change economy is an innovative economy direction that emerged at the junction of ecology and economy and global environmental requirements are conditioned. Agriculture, which is one of the major sources of greenhouse gas emissions, can play an important role in mitigating the effects of climate change. The principles of the economy of climate change are aimed at solving two key issues: achieving "improved growth" and achieving an "improved climate". Objectives of the review: to analyze the global processes of climate change; to study the economic impacts of climate change in Agriculture of Kazakhstan and Turkey; consider a system of measures to prevent global climate change in the context of the climate change economy. For review have used different literature as IPCC, WMO, WTO, FAO, UN reports and etc.
The influence of climate change on agricultural ecosystem services in Hungary

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Fogarasi Jozsef, Research Institute of Agricultural Economics, Budapest
Vigh Eniko Zita, Research Institute of Agricultural Economics, Budapest

The European Environmental Agency (EEA, 2016) reports that global climate change continues. Thirteenth goal of United Nations to achieve sustainable development is to take urgent action to combat climate change and its impacts. The significant impacts of climate challenge are disrupting the economy and people’s life, while by 2050 the World population is expected to grow by 2.3 billion people, the demand for food would continue to grow (FAO, 2009; Baldos and Hertel 2015), effects combined with rather unpredictable alterations in local temperatures and rainfalls is putting pressure on agricultural ecosystem services. Based on IPCC report (2014), scientific findings suggest that in Hungary varying impacts across regions and mostly negative variation on agricultural outputs by 2050 is expected, while country being a main cereal producer, observe enhanced negative environmental problems (Pinke et al. 2017). The aim of this study is to determine the climate factors, which may influence the Hungarian agricultural ecosystem services. Valuing ecosystem services (ES) – the goods and services provided by ecosystems to society (MEA, 2005) – is increasingly used to find the sustainable way of using natural resources and help the decision making process connection with natural capital. We use the cascade model in our research. The cascade makes a difference between ecological structures and processes created by organisms and the benefits that people derive from it (Haines-Young, 2010). The cascade model shows the connection between biodiversity, ecosystem function and human well-being. Based on agricultural results we expect that relationship between climatic variables and ecosystem services meets with our priori results. Yet predictions with respect to the impact on changes largely vary (see Olesen et al 2011; Trapp 2015; Qi et al. 2015). While, a comprehensive research on changing ecosystem services in Hungarian context is missing. We aim to investigate to which climatic changes may be captured in the ecosystem services of agricultural outputs in a net exporter of European agriculture, Hungary.


Forecasting model of wheat yield in relation to rainfall variability in North Africa Countries

Soliman Ibrahim, Professor of Agricultural Economics

This study was conducted to investigate the effect of weather conditions in terms of rainfall variations on wheat yield in Morocco. It is a representative case study of North Africa region. Morocco has the highest arable and rainfed acreage among North Africa region. Egypt was excluded as it enjoys, almost, a fully irrigated arable area. The data were collected for the period 2004 – 2015 from 12 stations for weather forecasting. The variability in wheat yield was estimated as a coefficient of variation. It ranged between 79.5% and 38.0%. However, it increased in poor-rain years and amounted to 50% in the regions of annual rainfall less than 350 mm. High correlation was found between the number of rainy days and rainfall in mm. Therefore, the later was used as a single independent variable in the forecasting model for wheat grain yield. The double-log form was the best fitted model for the response of annual rainfall. The reviewed literature from USA, Italy and Australia on the same subject confirmed such nonlinear relation between wheat yield and annual rainfall. The estimated wheat yield showed more effective significant response to monthly rain fall changes than the annual rainfall. The correlation coefficients between grain yield and monthly rainfall were high during spring season, i.e. 0.8525 for March, 0.5471 for April, and 0.6816 for May. The best fitted monthly rainfall model to forecast wheat yield was the double-log form. It showed that March’s rain is the critical month for wheat yield where the elasticity of production amounted to 0.587, while April and May rainfall showed an elasticity of 0.011 and 0.023, i.e. 10% change in in March, April and May rainfall results in 5.9%, 0.1% and 0.2% changes in wheat yield respectively. The estimated response of wheat farm price to grain yield showed that a 10% increase in wheat yield would decrease the farm gate price by 4.1%. It would be favorite to consumers but not for wheat producers. In conclusion, poor rainy seasons mean income foregone as expenses of inputs intensification per hectare and more drainage of hard currency in expansion of imported wheat. In good rainy seasons mean less sale price and less income to farmers but less subsidy in consumer’s bread price and less imports. Therefore, new policies are required. A country buffer stock of wheat is required for buffering the impacts of rainfall variations on wheat domestic supply. A regional strategic wheat stock should be established to compensate the negative impacts of very poor rainfall or drought years. It is recommended to be implemented as an integrated program among North African countries. In addition, a supplementary water source could be reserved in good rainy years to supply farms lacking irrigation water in poor rainy years. The arable areas of less than 30 mm rainfall should be allocated for livestock under a rational economical range management program.
Agricultural commodity market responses to extreme agroclimatic events

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Agroclimatic anomalies provoke uncertainty on the agricultural sector by driving production fluctuations and price variability on a par with economic and structural drivers. Economic simulation models typically operate under the assumption of ‘normal’ growing conditions, contain no explicit parameterization of climatic anomalies on the supply side, and confound multifarious sources of historical yield fluctuation in harvest-failure scenarios. In this article we follow a novel approach by augmenting a partial equilibrium model of global agriculture (Aglink-Cosimo) with a recently developed indicator of agroclimatic stress ('Combined Stress Index'). We perform a multi-scenario analysis where the most extreme temperature and soil-moisture anomalies of the last decades, both negative and positive, recur in the near future. Our results indicate that: (i) regional climate extremes may have significant economic impacts both at the domestic and international levels; (ii) the magnitude of the transmission effect depends on the attributes of the simulated extremes, the positioning of the impacted country in the trade arena, and the state of world stocks at the time of the shock(s); and (iii) crop prices display asymmetry to the direction of the agrometeorological shock with a higher responsiveness to negative anomalies that to positive ones.
Creation of Zero Net Energy and Net Carbon Agricultural Greenhouses

Vourdoubas Ioannis, External Expert, CIHEAM-MAICh

Transition to low carbon agriculture is very important for mitigation of greenhouse effect and climate change. Agricultural greenhouses consume large amounts of energy in space heating and cooling, for lighting and for the operation of various electric devices. The use of renewable energy sources which are abundant in many places using mature, reliable and cost effective technologies could replace the use of conventional fuels in greenhouses resulting in net zero energy and zero carbon emission greenhouses. Aim of this paper is to present a methodology for the creation of zero net energy and carbon emission greenhouses. Studying also a greenhouse located in Crete, Greece it will indicate the combination of various renewable energy technologies which could be used in order to achieve the abovementioned target of zero energy and zero carbon emission greenhouses.
SESSION 5A

Developing Countries and Challenges in Agricultural Sector

Room: Pythagoras

Chair: Anastasiadis Foivos
Regional differences in farmers’ preferences for a native bee conservation policy: the case of farming communities in Northern and Eastern Thailand

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Lippert Christian, University of Hohenheim - Department of Production Theory and Resource Economics (410A)

Evidence points to past bee-mediated crop pollination deficits in Chanthaburi province, Eastern Thailand. Conversely, no such evidence has yet been reported for Chiang Mai province (Northern Thailand), suggesting that wild pollination is delivered there above the requirements of local orchards. Discrete choice experiments (DCE) were conducted separately in each of these two ecologically different regions to elicit the preferences of pollinator-dependent orchard farmers with regard to three pollinator conservation measures and their possible effects on local native bee populations. We fitted mixed logit (ML) models on the resulting data to capture preference heterogeneity and to obtain willingness to pay (WTP) point estimates. Generalized mixed logit (GMXL) models were also fitted on the pooled datasets in order to inspect for (potentially bias generating) choice behavior differences between both regions, considering that respondents in Chiang Mai may have incorporated more unobserved factors into their choices than their counterparts in Chanthaburi, who were likely to provide less erratic answers due to their familiarity with crop pollination deficits. This yielded WTP space estimates (i.e., directly from WTP distributions) and made possible the comparison of farmers’ preferences for a native bee conservation policy in both regions. The results hint at significant WTP differences for some of the conservation policy attributes between both provinces. Furthermore, unobserved contributions to choice decisions seem to have been more random in Chiang Mai. Our analyses also suggest that farmers who engage in bee-related activities are WTP more for a conservation policy that includes bee husbandry.
Soil degradation and ecosystem services provision by farmers in Russia: what is the role of information sources?

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Bavorová Miroslava, Czech University of Life Sciences
Pilarova Tereza, Czech University of Life Sciences
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This paper addresses environmental challenges in the supply side of the ecosystem services from a farmer point of view. Major emphasis is placed on the role of information provided by various institutions and organizations on Russian farmers’ adoption of reduced tillage in Altai region. The Altai region (southwestern Siberia) is one of the largest agricultural production areas in Russia. Due to inappropriate cultivation in the past, the soil is threatened by soil degradation (Illiger et al., 2014). Previous studies recommend “reduced tillage systems” as a sustainable method of cultivating land endangered by soil degradation in the former steppe areas of Altai krai (Damman, 2011). Up to now, the adoption rate by farmers is still low. Deep soil cultivation that is especially blamed for the negative effects on soil structure and thus on soil erosion is still used. One of the reasons behind the low number of adopters of the reduced tillage systems is the difficulty of understanding and accounting of new systems’ benefits by farmers (Jelínek and Bavorová, 2015). Objective To our knowledge, a comprehensive empirical analysis of the information-seeking behaviour and its effect on farmers’ environmental land use behaviour has rarely been carried out in Russia. The main aim of this study is to fill this knowledge gap and to contribute to the understanding of how use of various information sources on agricultural management influences farmers’ reduction of use of intensive deep tillage cultivation and instead adoption of new soil cultivation systems.

Data and methodology. The presented study uses survey information on farmers (N=107, year 2016) collected in Altai region. The survey includes information on the farm and farm manager characteristics, adopted soil cultivation technologies, and information sources used by farmers. The logit model is applied to predict the probability of farmers’ application of new soil tillage system. Study considers the application decision (the share (%) of arable land on which the environmentally unfriendly old style deep tillage with depth of more than 20 cm is applied) as a dichotomous problem (1=adopters with less than 20% of area with deep cultivation and 0=non-adopters with more than 20% area of deep cultivation) for estimation. Findings: Our findings demonstrate that a large farm size, high labour intensity and high share of rented farm land decreases the probability of use of tillage with reduced depth by farmers. Furthermore, the results provide a first indication that large corporate farms and farms with high profit-oriented objectives less probably apply new reduced depth tillage. Farm managers’ participation frequency on trainings increase the probability of adoption of less intensive soil tillage systems. Differently, farm workers’ participation frequency to trainings decrease the probability of use of less intensive tillage systems. The reason for this is difficult to explain. Opposite of our expectations, consultation frequency on agricultural management issues from private consulting firms and from Ministry of Agriculture was found not to be a statistically significant determinant for explaining adoption behavior in our model.
Cognitive Ability and Bidding Behavior in Second Price Auctions: An Experimental Study

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Lee Ji Yong, University of Arkansas
Nayga Rodolfo, University of Arkansas
Deck Cary, The University of Alabama

Behavioral biases are more pronounced for individuals with lower cognitive abilities. Our study examines what connection, if any, there is between cognitive ability and bidding strategy in second price auctions. Despite truthful revelation being a weakly dominant strategy, previous experiments have consistently observed overbidding, which makes use of such auctions for inferring homegrown value problematic. Examining the effect of cognitive ability is important as it may help identify when one can reliably recover values from bids. The results indicate that more cognitively able subjects behave in closer accordance with theory, and that cognitive ability partially explains heterogeneity in bidding behavior.
Role of information in the valuation of unfamiliar goods – the case of genetic resources in agriculture

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Ahtiainen Heini, Natural Resources Institute Finland (LUKE)
Pouta Eija, Natural Resources Institute Finland (LUKE)
Czajkowski Mikolai, University of Warsaw

We analyze information effects on stated preferences for an unfamiliar environmental good using the data from a discrete choice experiment on conservation of agricultural genetic resources, i.e. native animal breeds and plant varieties. The intensification of agriculture has led to major changes in the utilization of agricultural genetic resources. Consequently, many previously common animal breeds and crop varieties are currently on the verge of extinction worldwide. In Finland, there has been some progress in putting the conservation programs for agricultural genetic resources into action, but they have not been implemented fully due to the lack of resources and political interest. In addition, there is no information on the economic benefits of such programmes. Thus, this study estimates citizen’s use and non-use benefits from the conservation of agricultural genetic resources to support policy-making, and examines information effects in the context of valuing unfamiliar goods. In this study, we define two groups of respondents based on their use of additional information provided in an internet survey. The determinants explaining the use of information are examined with the logit model and the effect of information use on individual preferences and scale is examined using mixed logit (MXL) models. Our findings indicate that both socio-demographic and attitudinal variables affect the use of information, with the respondent’s age, gender, familiarity and perceptions of stakeholder responsibilities having a significant effect. The results show individual preference heterogeneity, but no significant differences in scale between the information groups after allowing the mean coefficients for the attributes to differ. The respondents who had read the additional information supported the conservation more frequently, and their choices could be explained with several environmental attributes characterizing the conservation programme of agricultural genetic resources. The choices of the respondents who did not read the information were associated with fewer significant conservation attributes, and the attribute coefficients were lower than for those having read the information. This suggests that reading additional information had a positive effect on utility derived from the environmental good. In addition, the findings suggested that the choices of those who had read the additional information were less random, indicated by the significant and positive covariate of scale. Our results highlight the importance of genetic resource conservation and controlling for the effects of information use in choice experiment models, especially in the context of unfamiliar goods.
Digital technologies towards resource efficiency in the agrifood sector: key challenges in developing countries

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Responding to resource efficiency in agrifood sector is a global urgent issue considering the urbanisation phenomena and increasing nutritional needs. Despite the ongoing progress in digital technologies that could enable resource-efficient operations in field, their effectiveness - even in developed countries - remains debateable mainly due to the limited understanding and adoption of farmers. Among others, ease of access, training and engagement in such technologies seem to be challenging for most of the stakeholders, especially at the production stages. Specifically, in developing countries, that often encounter major natural resources issues, the diverse socio-cultural background of the farmers hinders the adoption of digital technologies to perform agricultural operations. In this regard, we explore publicly available data sources (e.g. institutional reports, databases etc.) to identify key challenges in adopting digital technologies for efficient resource use, from a systems-level perspective. Thereafter, we map the determinant factors using Systems Dynamics methodology to identify areas of interventions to limit natural resources’ appropriation and support agrifood sustainability.
SESSION 5B

Agro-Food Chain’s Partnerships and Eco-System services

Room: Socrates

Chair: Chmielinski Pawel
Foreign Land Acquisitions and environmental regulations. Does the Pollution-Haven hypothesis hold?

Raimondi Valentina, University of Milan
Scoppola Margherita, University of Macerata

In few years, millions of hectares in many developing countries have been acquired by foreigners (Foreign Land Acquisitions, hereinafter, FLA). Several concerns have been raised by international organizations, NGOs and the media, for the potential negative environmental externalities. Because FLA rapidly introduce industrial practices in developing countries agriculture, soil depletion, eutrophication and coastal dead zones are very likely (Ezarus, 2014). The expansion of large-scale monoculture implies more pesticide, fungicides, herbicides and fertilizers, with pollution of the downstream waters, loss of biodiversity and emissions of nitroux osside (UNEP, 2011). The loss of forests and pastures increases carbon dioxide emissions. Further, large scale acquisitions put pressure on natural resources, especially in terms of water use (Dell’Angelo et al, 2017). The United Nations Environment Programme (UNEP) recommends developing countries to implement environmental policies in order to mitigate negative externalities (UNEP, 2011). However, environmental stringency may itself affect FLA. According to the so called pollution-haven hypothesis (PHH), foreign firms tend to locate production in countries with less stringent environmental regulations (Erdogan, 2014). This paper aims at providing empirical evidence on the impact of environmental stringency on FLA, an issue that has been not addressed to date by they literature. The idea is that foreign firms choose to locate production in countries where large-scale monoculture face lower costs due to environmental regulations and where they can expand large-scale agriculture at the expenses of previous forests. We check whether differences in the stringency of environmental regulations between the investor and the target country positively affect the decision of investing abroad and the size of investments (does the PHH holds for FLA?). As in previous empirical studies on FLA (Arezki et al 2015; Lay, Nolte, 2017; Raimondi, Scoppola, 2018), we use a gravity-like equation, albeit in a panel data framework. Our unbalanced panel of bilateral land acquisitions data includes 66 investor countries, 70 target countries and 9 years. Our empirical specification follows Bergstrand and Egger (2013a and 2013b) and Kleinert and Toubal (2010) who provide a rationale for estimating time-varying gravity equations of FDI. One important issue addressed is the quality of FLA data. We use Land Matrix, which includes data from various unofficial sources, but we check the robustness of our results to the use of different data sources. We consider different dimensions of environmental stringency. In the first place, we use the environmental performance index database (EPI). For robustness check we use also other indexes of environmental stringency such as those included in the World Economic Forum database. Our results show that differences in environmental stringency do affect FLA. Firms from countries with a high level of protection of forests and of the overall habitat and biodiversity tend to invest more in countries with a lower level of protection and where deforestation is more feasible. In this perspective, these results represent a preliminary confirmation of the PHH. The potentially low quality of some of the data sources does not undermine the main messages coming from our estimations.
The integrated supply-chain projects as a policy approach for encouraging cooperation for innovation in agriculture and rural areas

Cristiano Simona, CREA PB
Tarangioli Serena, CREA PB

The integrated supply chain projects (ISCPs) represent an innovative approach to Rural Development Policy for addressing structural as well as organizational challenges of local agro-food chains, in view of increasing their competitive advantage and competitiveness together with the entrepreneurial performances. This approach was applied in Italy under the regional Rural Development Programmes (RDPs). An integrated supply chain project reflects the shared strategy and objectives of a partnership for the development of a specific local supply chain. Under a common framework of cooperation, the partnership of an ISCP involves a number of relevant actors, upstream and downstream the specific supply chain, such as producers, transformers, suppliers, and others, who serve the integration of the farms and the agro-food holdings, both horizontally and vertically. The business plan of the ISCP describes the material and immaterial investments which will be undertaken by each partner in order to contribute reaching the common goals of the specific local supply chain development. The experience gained by the ISCPs in RDPs 2007-2013 needs to be considered significant for the EIP-AGRI approach and of the Operational Groups (OGs) to be implemented in the current programming period 2014-2020, because it stimulated innovation across the supply chains, particularly through implementing a collaborative model of knowledge transfer and co-creation. In fact, the ISCP approach demonstrated a certain capacity to connect different actors of the AKIS, establishing the link between the research and the entrepreneurship worlds and arranging collaborative networks. Also, the partners of the ISCPs applied, among the others, a relevant number of investments in cooperation for innovation, supported by the measure 124 of the RDPs. The objective of this research is to provide an overview of the innovation projects carried out by the ISCPs (amount of investments, types of innovations and agro-food supply chains and actors involved) and deepen on the "value drivers" of the agro-food supply chain’s performance and models for co-creating the innovations realized (entrepreneurial experience, local reputation and consumer recognition; trust and interaction among partners and cross-overs). The research is based on a mix-method approach supported by different tools and methods for the observation and analysis of the ISCPs, such as desk research, interviews and focus groups. The results of the study show that: (1) The ISCPs demonstrated to be good sets for developing innovation ideas and knowledge sharing. On this regards, it also emerged that, the ISCPs approach helped participants to develop collaborative and innovative attitudes, which lasted even beyond the completion of the specific projects. (2) the ISCPs approach has a certain potential in spreading innovations which track the road for the development of entire specific agro-food chains by involving a large number of relevant actors. On this regards, it emerged that the ISCPs apply a systemic approach to the implementation of innovations, due to their strategic positions in the sectors/domains. (3) The partnerships applying for innovation projects developed within ISCPs are broader than the others, in terms of multi-actoriality and of number of participants.
An Appraisal of Al Ain’s Consumers’ and Farmers’ acceptance of Treated wastewater resources

Chfadi Tarik, College of Food and Agriculture, United Arab Emirates University
Gheblawi Mohamed, College of Food and Agriculture, United Arab Emirates University
Thaha Renna, College of Food and Agriculture, United Arab Emirates University

The sustained economic growth that the UAE has enjoyed in the last decades has brought about a rapid growth in population and an even greater increase in the rate of water consumption. Given the limited water resources and the high environmental and financial cost of desalination, the efficient use of reclaimed/recycled water in irrigation, landscaping and other non-potable uses presents an economical and secure alternative to diversify water resources. However, the reuse of recycled water might face some hesitation by farmers and consumers, even when the risk of contamination is very low; it is important to establish how the stakeholders perceive this alternative, and understand the factors that affect their attitude. A 1500-participants sample of Al Ain residents, representative of the general population, were surveyed on their acceptance regarding various applications of recycled water. The analysis of collected data provided interesting details residents’ preference for TWW reuse, for various applications like Industrial, Non Food Agricultural, Domestic and Food/Agricultural application, for religious applications (ablution), and in direct and indirect water supply. More regression analysis is been carried to test the different hypotheses regarding the factors affecting public awareness and acceptance of TWW reuse. Simultaneously, a sample 300 Farmers from the City of Al Ain are been surveyed on their acceptance of the use of TWW in different agricultural applications. In addition, the farmers are also asked about their willingness to use TWW in their own farm, and their Willingness to Pay for the TWW, and finally, they are presented with a choice experiment where they have to pick between TWW and groundwater. Keywords—Irrigation, Treated Waste Water, Acceptance, Willingness to pay, Choice Experiment.
Brazilian experience in Ukraine: crop receipt as a new tool for financial grow

Gerasymenko Natalia, The National University of Life and Environmental Sciences of Ukraine
Zhemoyda Oleksandr, The National University of Life and Environmental Sciences of Ukraine

Ukraine has one of the best farmlands in the world and is the leading producer of sunflowers, wheat, soybeans, corn, and other agricultural products. Agriculture is also a key economic sector for the country. According to the World Bank, agriculture represents 14 per cent of GDP and 42 per cent of total exports. Yet the sector is nowhere near its potential: with greater efficiency and investment, Ukraine’s agricultural output could double, or even triple. Reforms are underway, but agricultural producers still need financing to succeed. The World Bank Group/IFC AgriFinance and Crop Receipts team is working to address this issue. Agricultural producers need to attract financing to improve their yields and increase the incomes. This may be achieved either by bank financing or trade credit, but in recent years bank financing has fallen because of a lack of collateral, resulting in limited access to financial resources. Input suppliers provides mainly trade credit for working capital input requirements. But farmers still face a shortage of midterm financing to improve facilities, upgrade equipment, and support noninput working capital needs. Crop receipts as the financial instrument originates from Brazil, where it demonstrates outstanding results, attracting 5 billion USD or one third of total farmer financing annually. A crop receipt is essentially a loan agreement between the farmer (borrower) and the creditor, where the loan is repaid by future harvest itself (crop receipt with delivery), or proceeds from its sale (financial crop receipt). In any case, the liability is linked to a specific amount of a specific crop with specific quality with a lean on the land where it is grown. The price of the crop is fixed in the crop receipt between the two parties, or it is linked to a procedure acceptable to both parties. It can be tied to commodity market spot or future prices, which makes it also a hedging instrument. Lack of financing for working capital and equipment (particularly acute is a need for longer-term, local currency funding), poor agronomy and financial skills, outdated agricultural equipment, and a lack of quality storage are the main issues of primary agri producers. Could Brazil experience in crop receipts be implemented in Ukraine?
Successful collective agro-food chain establishment: Lessons from sunflower case in Brazil

Oliveira de Sousa Lucas, Hohenheim University, the South Westphalia University of Applied Sciences, Federal University of Mato Grosso

The successful establishment of agro-food chains can be a mean of achieving sustainability. The sunflower agro-food chain in Mato Grosso, Brazil sets an example of successful farmers’ collective endeavor with implications on sustainability issues. Thus, this study aims at identifying and analyzing the underlying reasons for this successful farmers’ collective initiative. With this purpose, a case embedded design research approach was applied with the analysis structured based on an analytical framework that considers the establishment of an agri-food chain as an entrepreneurial process, comprised of three stages – planning, implementation, and growth. The analysis showed that the successful collective sunflower agri-food chain establishment process in Mato Grosso stems from a set of driving factors composed mainly of entrepreneurship, social network, and resource availability. These factors favored horizontal cooperation and allowed farmers to independently identify and develop the opportunity related to the sunflower agri-food chain, overcoming barriers associated to the initial development stage of sunflower sector in Brazil, reducing transaction costs and difficulties related to downstream collective vertical integration. The establishment of agri-food chains has been a topic mostly related to smallholders. This subject has increasingly been part of the policy agenda of government entities, NGOs, and development agencies, which see agri-food chains as a strategy for promoting socio-economic growth in poor rural areas from developing and emerging countries (DONOVAN et al., 2015). Nevertheless, the findings from sunflower case in Brazil suggest that the collective establishment of agri-food chains led by outside actors (e.g. intermediary organizations) is a complex endeavor. The main reason for this complexity is that the driving forces behind the successful agri-food chain establishment process are factors difficult to be framed or fostered, especially among small-scale farmers in contexts of rural poverty in developing countries.
SESSION 5C
Mitigating Agricultural GreenHouse Gas Emissions at the EU

Room: DEMOCRITUS

Chair: Malorgio Giulio
Abatement of agricultural greenhouse gas emissions in the European Union: a revised analysis of marginal abatement costs

Isbasoiu Ancuta, UMR Economie Publique INRA/AgroParisTech
De Cara Stéphane, UMR Economie Publique INRA/AgroParisTech
Jayet Pierre-Alain, UMR Economie Publique INRA/AgroParisTech

Avoiding the adverse effects of climate change has become a key priority for the European Union (EU). In this regard, marginal abatement cost curves (MACCs) of greenhouse gas (GHG) emissions are an important tool for assessing the potential for efficient reduction from a cost-effectiveness perspective. Aiming at providing MACCs for the agricultural sector of the EU, we process simulations based on an agricultural supply side model calibrated against 6 economically contrasted sets of annual data (2007-2012). In this paper, we thus take a different perspective by basing the simulations on a set of years that reflect very contrasting economic contexts (agricultural prices, fertilizer prices, changes in agricultural policy, general economic context). The elements of economic contexts condition the marginal cost curve at two levels: i) they determine the level of emissions in the absence of regulation (at zero emission prices) and ii) they determine the opportunity cost of reducing with a unit the emissions and the response that can be expected from the introduction of emission pricing. Estimated in carbon dioxide equivalent, GHG under consideration are nitrous oxide and methane, the two most important gases emitted by the European agriculture. The assessment is made at the European Union level, both at regional (FADN regions) and infra-regional (farm types) levels. Simulations are realized via the introduction of a carbon price ranging from 0 to 200€ per metric ton of equivalent emitted carbon dioxide. In addition, we also benefit from the advantage of a model that allows to represent agricultural supply on a large scale (EU-27) and that includes a wide variety of production conditions through representation. In line with past published evaluation, this study is enlarged to the EU-27, and more importantly provides sensitiveness to economic variability. Based on the 6 highly contrasted annual sets of data, a EU decrease of GHG emissions by 10% would require a CO2 price ranging from 80 to 150 €/tCO2eq. In addition, we provide distributions of abatement ratio over farm types and regions for the different years and for different carbon prices, showing, over the EU, the large spectrum of individual abatement ratios against a given price. In order to assess the regional distribution of abatement costs, both spatial and temporal dimensions were analyzed. The economic context draft by annual data accounts significantly in the variations. Years 2007 and 2010 are more characterized by abatement rates above the average abatement rate calculated for each EU-27 FADN region and each level of emission tax introduced (30, 50 and 100€/tCO2eq), over the 6 years. 2009 presents the peculiarity of an approximately equal distribution between regions with lower and higher abatement rates compared to the average abatement rate, while in 2008, 2011 and 2012, almost all regions show abatement rates with values below the average abatement rate. Yearly sets of prices and tax effects play an important role when estimating the cost of GHG emission abatement.
Conciliating food production and agricultural greenhouse gas emissions at the European Union level

Isbasiou Ancuta, UMR Economie Publique INRA/AgroParisTech
Jayet Pierre-Alain, UMR Economie Publique INRA/AgroParisTech
De Cara Stéphane, UMR Economie Publique INRA/AgroParisTech
Darzi Parisa-Louise, UMR Economie Publique INRA/AgroParisTech

Mitigating greenhouse gas emissions can be achieved via market-based instruments, therefore affecting economic activity. This paper focuses on the arbitrage between and within productions and greenhouse gas emissions at the European Union (EU) level. We introduce the pricing of GHG emissions, taking into consideration the direct emissions of nitrous oxide (N2O) and methane (CH4) sourced from EU agriculture. The analysis aims at finding out what might be the impact of an emission tax on agricultural commodities brought to the market. By using the European agro-economic AROPAj model, we assess the effects that can occur in the crop and livestock production in the EU, when introducing a CO2 price. We analyze the trade-off between and within productions at the European level and the environment as results of policies targeting GHG emissions. We show how quantitative modelling tools may contribute to assess the impacts of carbon pricing on food security. In the model, the GHG price is based on Global Warming Potential of GHG evaluated in CO2 equivalent (with ratios provided by IPCC when time-horizon is 100 years). The study highlights counter-intuitive elements such as increasing the supply of agricultural products - especially cereals and oilseeds - for a rise of the carbon price, for a price level below 50 or 100€ according to the products and the Member States. The increase in the simulations concerns both the areas and the quantities of products, whether these products are marketed or reused at the farm (for animal feed). On the other hand, livestock production, milk and meat, decreases significantly when the CO2 price increases, whatever the level of this price. We complete the analysis by estimations of changes in crop- and animal-sourced calories in diet when changing the CO2 price. The reduction of emissions in CH4 and N2O (measured in CO2 equivalent), of the order of 25 to 35% according to the calibration "year" of the model (2007 to 2012) for a price of 200€/tCO2eq, is definitely stronger for methane than for nitrous oxide. This result is consistent with the fact that livestock productions are more "sensitive" to the CO2 price, because they are associated with the emission of methane that is easier to reduce via animal feed, according to the model. These effects are due to complex substitutions regarding crops, grasslands and fodders, being related to the problem of animal feeding (on-farm recycled grain cereals, concentrates and grasslands and fodders). At the EU level, when increasing the CO2 price over a limited price range leading to reduce GHG emissions, comes with an increase of the cereal quantities (both marketed and on-farm use cereals), a stability of oilseed quantity, a decrease in milk and meat supply and a strong reduction of grasslands and fodders areas.
Economic tools aiming at nitrogen use reduction by the European agro-system

Ollier Maxime, INRA
Pierre-Alain Jayet, INRA

Mineral fertilizers are often used by agriculture, all around Europe. Crops require nitrogen for their metabolism and these fertilizers may strongly increase the yields. However, mineral fertilizers, when they are used excessively, may be the cause of several environmental problems. For instance, nitrates, that are seeping into the ground, until groundwaters or steams, can deplete the quality of water. Nitrous oxide, a powerful greenhouse gas, which may contribute significantly to global warming. For these reasons, public authorities need to have tools to control better the quantity of fertilizers that is spread. Through AROPaj, a technico-economic model of the supply side of the European Agriculture, an increase of the price of mineral fertilizers (until 200% of the initial price) was implemented in 6 years, from 2007 to 2012. The purpose of this study is to analyse farmers’ behaviour, concerning mineral fertilizing demand, land use or greenhouse gas emissions when they face the introduction of a tax on fertilizers price, other things being equal. Results show that an increase in fertilizers price may reduce their consumption but also reduce the greenhouse gas emission from the agricultural sector in the European Union. More precise simulations for France, in 2009, show that some regions are more affected by a tax on nitrogen fertilizers price than others. These simulations also show that the part of land allocated for cereal crops may decrease, in favor of permanent pasture and wasteland.
Bio-economy in Germany: Insights into public perceptions

Hempel Corinna, Johann Heinrich von Thuenen-Institute, Institute of Market Analysis
Will Sabine, Johann Heinrich von Thuenen-Institute, Institute of Market Analysis

Bio-economy describes the transition from an economy based on fossil resources to an economy based on renewable resources (i.e. plants, animals, and micro-organisms) and resource-efficient recycling. Bio-economy has recently received great attention from politics and science, because it presents a promising response to global challenges such as the growing population, climate change as well as loss of soil fertility and biodiversity. The increase in bio-economy strategies worldwide mirrors its growing importance. To ensure the success of a transformation to a bio-based economy it is necessary to involve society into the transition. So far, there has neither been any study that grouped people based on their common understanding of bio-economy nor any research about the public perceptions on the bio-economy in Germany. Therefore, this contribution adopted a Q methodological approach in combination with focus group discussions to close this gap. While focus group discussions are purely qualitative, Q studies combine a quantitative and a qualitative approach and are applied to empirically assess people’s subjectivities on a certain topic through a by-person factor analysis. In summer 2017 forty-five Q interviews were carried out with people varying in their sociodemographic background and their environmental awareness for the purpose of covering a very broad range of opinions. Three perspectives on bio-economy were identified: “Sufficiency and close affinity to nature”, “Technological Progress”, and “Not at any price”. The first perspective is characterised through a distinct awareness of environmental interactions and global problems. Solutions are expected to be found in rather traditional practices. In contrast, the perspective “technological progress” regards technological innovations (e.g. genetic engineering, precision farming, etc.) as important counteract the finiteness of fossil resources. The perspective “Not at any price” focuses on cost-benefit relations and the profitability of a bio-economy; all actions taken must not negatively impact the current standard of living. Focus group discussions carried out in autumn 2017 revealed that people representing the three perspectives differ in their perceived effectiveness of their individual actions on global problems. For example, participants who are concerned about cost-benefit relations rather perceive recommendations concerning the reduction of meat consumption as paternalism. People across all three perspectives agree that the society has to be better informed to successfully induce the development of a viable bio-economy. Therefore, the different perspectives on bio-economy and their specific characteristics need to be considered to create a successful communication strategy. While new and innovative technologies need to be explained including an open debate on their risks and benefits, the potential of sufficiency, organic farming, and cascade use amongst others, has to be addressed as well. At the same time, the fear of higher prices and a descent of today’s living standard needs to be considered in information campaigns to accommodate those people who are price-sensitive and sceptical about the impact of economic transformations on their future well-being.
SESSION 5D

Food Industry

Room: THEOFRASTUS

Chair: Kraciński Paweł
Market Power in EU Food Processing Sector: A Stochastic Frontier Approach

Cechura Lukas, CULS Prague

The paper deals with the identification of the degree of market imperfections in the input processing market and provides a comparative analysis among the different EU countries and different industries. For detection of the abuse of oligopsonistic/monopsonistic behavior a mark down model using stochastic frontier methodology was derived. A system GMM estimator was employed to address the endogeneity problem. Moreover, a multi-step estimate of the mark down model was used to differentiate between the transient and persistent part of market power component. The analysis is carried out using the AMADEUS database and the micro level perspective. The results suggest the presence of some degree of non-competitive behavior in all analyzed countries. In particularly, some companies are characterized by significant oligopsony market power. However, the results show considerable differences among analyzed countries. Finally, the distinction between transient and persistent part of market power component helps to better identify the real level of market power imperfections and their sources.
Analysis upon the development potential of the food industry in EU-28

Rusali Mirela, Institute of Agricultural Economics, Bucharest

The sustainability of the food supply of the population in all Member States is a priority objective of the current CAP, with important implications both for ensuring food security and for developing the rural economy. In this context, the European economic model promotes sustainable development based on competitiveness, innovation and knowledge, where a key role lies with the small and medium-sized enterprise sector, due to its great flexibility in adapting the business to new market requirements. Starting from the idea that the available balance of economic enterprises allows financing of investments as a source of innovation and development, the paper provides the main results of investigation upon the development potential of the food industry in the EU-28 countries, in terms of the dynamics and structural comparisons, aiming to highlight the changes in performance and the gaps that determine the hierarchy of countries, in view of increasing convergence as a basic factor for a sustainable single market.

The research method used the comparison of the relevant economic and financial indicators for the activity of enterprises in the agri-food industry, using the most recent available statistical material provided by Eurostat - The survey on the activity of the manufacturing enterprises data - NACE Rev.2 codes.
Segmenting university students by sustainable food consumption behavior

Kamenidou Irene, Professor, Eastern Macedonia Thrace Institute of Technology (EMaTTech),
**Mamalis Spyridon**, Associate Professor, Eastern Macedonia Thrace Institute of Technology (EMaTTech)
Pavlidis Stavros, Adjunct Professor, Eastern Macedonia Thrace Institute of Technology (EMaTTech)

Due to the continuous food crises, there has been increasing concern regarding food quality and food safety. Additionally, environmental concerns arose interest in sustainability, for the world to be able to satisfy the needs of the future generations. A sustainable environment and sustainable development have as a prerequisite a change of consumers’ consumption patterns, moving from a conventional food pattern to a sustainable one, and thus resulting in production demand for sustainable food products. In this context, this research deals with university students’ perceptions of sustainable food consumption and their likelihood to engage in sustainable food consumption behavior. It also segments students based on these variables. Quantitative research was implemented with an online questionnaire, which resulted in a collection of a 250-valid sample. Data analysis employed descriptive statistics and K-Means cluster analysis to group the students based on their behavior. Results and limitations are discussed, and marketing implications are suggested.
Food dependence and agricultural policies: case of Algeria

Bouzid Amel, CREAD

Have food consumption improved over the last half century in Algeria? If there is improvement, has it been achieved mainly through the growth of local productions or through the use of world agrifood markets? How can we explain the evolutions? Using the FAO statistical database, the average food ration was calculated over two periods (1963-1967 and 2007-2011) by weighting with the population size of each year. Then we calculated the composition of this food ration in proteins (animal and vegetable). For the same periods, the import share was determined in the food ration to show the degree of food security achieved by the country. The average food intake per capita - expressed in calories - has improved significantly quantitatively since it has been multiplied by 2. During the last period, the ration reaches the level of Spain. There is also a significant improvement in terms of quality. Even if the ration remains highly dependent on the consumption of plant products, the share of animal protein is multiplied on-year by 3.1. In terms of fat, they have been multiplied by 2.1. However, as much for total fat as for animal protein, the food intake remains very low that calculated for example in Spain. This improvement in average food intake is largely due to rising food imports. In half a century, the share of imports in the composition of the ration has increased from 36% to 68%. Several factors explain the increased food dependence from outside. In addition to population growth and rising household incomes, the determining factors appear to be those of agricultural policies and economic governance. These latter factors translate into the poor performance of the agricultural sector in terms of the use of productivity factors and, ultimately, in terms of low yields.
Apple market in the European Union

Kraciński Paweł, Institute of Agricultural and Food Economics National Research Institute

The aim of the research was to examine the changes within the apple market in the European Union. The paper analyzes the size of the EU’s production, consumption and foreign trade and identifies the largest exporters and importers of apples. The competitive position of the EU’s major exporters of apples was determined by the use of ex-post measures. The study covered the years 2011-2016.
SESSION 5E
Farming Challenges and Agricultural Policy
Room: ARISTOTLE
Chair: Gadanakis Yiorgos
Marketing innovations for sustainable sheep and goat transhumance: A case study from Northern Greece

Ragkos Athanasios, Agricultural Economics Research Institute/HAO Demeter
Lagka Vasiliki, Department of Agricultural Technology, Alexander Technological Educational Institute of Thessaloniki
Arsenos Georgios, Faculty of Veterinary Medicine, Aristotle University of Thessaloniki

Transhumance is a system that pertains to the climate conditions and geography of Greece, especially of its mountainous, disadvantaged and marginal areas. Nowadays, there are about 3000 transhumant flocks in Greece, which rear approximately 1.1 million sheep and goats (about 7.5% of the sheep and goat population). Transhumance is a multifunctional system providing a wide range of ecosystem services including safeguarding tradition, maintaining environmental balance, protecting genetic diversity and contributing to rural livelihoods. The provision of such services is subject to the viability of the system, which is based on several endogenous and exogenous factors. Revenues are low and farmers are generally not satisfied with their incomes, although there is evidence that they remain in the profession also for non-economic reasons. Family labor, low dependence on fixed capital and relatively low demand for variable capital, mainly due to grazing in mountainous pastures, are some of the features leading to cost savings which improve the economic performance of farms. In this context, transhumance-specific dairy products have high economic prospects. They often have excellent quality and organoleptic characteristics, as the milk produced in summer is of higher quality due to the important floristic diversity of mountainous grasslands. Nonetheless, most industries mix this milk with milk produced in other farms. As a result, there are no transhumance-specific products reflecting the whole range its cultural, social, historic and environmental contributions. Farmers are not rewarded accordingly, consumers remain unaware of the multiple contributions of the system and, inversely, the system is cut off the market. This paper presents a comparative assessment of three different approaches in milk sales and manufacturing of dairy products from transhumant farms. The first involves cheese production on-farm and direct sales to consumers. The second is based on producing cheese solely from milk from transhumant flocks in a dairy situated in a highland community. In the third approach farmers continue to sale their milk to the same industry throughout the year and their milk is mixed with milk from non-transhumant farms. All necessary information is gathered through questionnaire surveys. Issues such as the incorporation of family tacit knowledge in production, marketing prospects, future aspirations and the reasons behind the choice to follow one of the three approaches are discussed in depth. The role of dairies is also assessed through interviews with three dairies. The first is a small family dairy situated in the highlands, the second is a small dairy in the lowlands and the third a medium-sized industry in the lowlands. A technical and economic analysis shows that milk transformation in the highlands is the best solution, as it leads to less labor requirements for farms, while the first approach performs worst, due to the low price of milk, and the third approach can only be profitable if cheese production on-farm becomes more systematic and organized. These results are supplemented by a qualitative comparative analysis of the key issues defining the efficiency, needs, limitations and implementation difficulties of each approach and a SWOT analysis of transhumance-specific dairy products.
Exploring factors of farm resilience in Russia:
business group affiliation, location and ownership

Gagalyuk Taras, Leibniz Institute of Agricultural Development in Transition Economies
David Epshtein, Northwest Research Institute of Economy and Organization of Agriculture
Curtiss Jarmila, Technology Centre, Academy of Sciences of the Czech Republic
Unay Gailhard Ilkay, Leibniz Institute of Agricultural Development in Transition Economies

Previous studies have pointed to less efficient cost structures and lower profitability of large-scale farms affiliated with business groups, also known as agro holdings, in comparison with their smaller counterparts in transition economies. Nevertheless, agro holdings continue growing in land and assets by acquiring smaller farms, and this ongoing trend points to agro holdings’ higher resilience, a construct that encompasses factors that go beyond economic efficiency. Resilience is particularly important to be able to operate in a turbulent business environment marked by fast-changing policies and a weak financial sector, such as in Russia, as well as to withstand the severe effects of any external shocks. The objective of this study is to explore resilience of Russian farms towards external shocks such as the economic crisis of 2008. The data used is derived from financial statements of agricultural enterprises of North-West Russia for the period of 2000-2012. This period includes the year of the global financial crisis, which affected Russia’s economy and its agricultural sector. Therefore, year 2008 is considered the year of the shock to the agricultural system against which the farm resilience is assessed. The database consists of a 12-year panel of 617 agricultural enterprises. We analyze resilience indirectly in that we estimate the impact of various factors on farm post-crisis sales recovery. It involves a regression analysis of annual sales growth in a panel data setting using a fixed effect model. Significant differences in resilience to economic shocks were found between farms due to an effect of various factors. Enterprises affiliated with agro holdings are on average more resilient (show an insignificant sale response to 2008 crisis), while other enterprises show statistically significant negative sales shock with a slow sales recovery over the post-crisis period. Farm indebtedness (leverage) has an ambiguous effect on resilience. While indebtedness helps non-affiliated enterprises to recuperate from the negative sales effects of the crisis, the indebtedness effect is opposite in the case of agro holding-affiliated farms. Significant differences in farm resilience are also found between regions of operation and ownership (with cooperative farms being least resilient). Contrary to financial theory that considers high indebtedness (leverage) to increase bankruptcy risks, our results suggest that in the context of transition economies, external funding is crucial for effective farm restructuring and farm resilience. In line with corporate governance literature, our results also indicate that limiting managerial discretion (by ownership concentration or incentives alignment) can contribute to farm resilience.
Economic analysis and energy balance of agricultural production in Northern Greece

Tziolas Emmanouil, Aristotle University of Thessaloniki
Bournaris Thomas, Aristotle University of Thessaloniki
Moulogianni Christina, Aristotle University of Thessaloniki
Kappas Thomas, Aristotle University of Thessaloniki

The new European Union directives focus on renewable energy forms for the primary sector. Farmers tend to comply with the new CAP rules in order to ensure direct subsidies and ignore the derived benefits from a potential bio-energy generation system. A Life Cycle Costing approach has been implemented to assess the economic implications of agricultural production in Northern Greece and specifically in the Region of Central Macedonia. All the costs and potential revenues related with conventional agricultural practices have been analyzed for the most important crops of the research area. In addition, subsidies have been taken into account with manifold forms (e.g. direct payments, greening, and coupled payments) to identify their magnitude in the region. Furthermore, the energy inputs for each cultivation, along with the inputs, potential energy generation from biomass exploitation are calculated considering average per hectare rates for fuel consumption, fertilizers, agrochemicals, irrigation etc. Finally, an energy efficiency indicator is illustrated for every crop. From the results, we can conclude that the formulation of partly energy independent areas in Northern Greece is a viable plan, though the financial support of the new CAP stimulates the existent production plan to non-profitable annual crops with less motivation to sustainable forms of agricultural production. In this context, the augmentation of tree crops and energy crops could generate more gross revenue for the farmers and develop a sustainable framework for rural areas in Northern Greece.

Structural Changes in Agriculture as Background for Nutrition and Trade

Gerasymenko Natalia, The National University of Life and Environmental Sciences of Ukraine
Zhemoyda Oleksandr, The National University of Life and Environmental Sciences of Ukraine
Los Dmytro, The National University of Life and Environmental Sciences of Ukraine

A number of scientific papers describe the nutrition habits as the one of the determining reasons for and trade as the main factors of food security development. In some countries, trade liberalization was initially adopted as a domestic, unilateral strategy. An increase in food imports can have nutritional implications by altering food availability and/or prices, thus helping to shape consumer preferences. At the same time, globalization has been strongly associated with a significant increase in the concentration of corporate ownership across the whole food-supply chain from production to processing and retailing. This is occurring across all regions of the world albeit at different rates. Overall, there is convincing evidence that globalization has magnified key supply-side drivers shaping diets in different parts of the world. Thus, it is obvious that there exist different interconnections between the food security categories on national, regional and global levels. Global character of food security as economic category is of no doubts, though its interrelated factors are in turn influenced by a number of aspects, not only on the global level but also on the regional and national levels. The world’s demand for agricultural products is exceeding its supply. Numerous researches describe the main reasons for difference between food production and demand. The main goal of the current paper is to link the relationships between the structure of nutrition and external trade with structural characteristics of agriculture and analyse their
resulting cumulative impact on supply redistribution (and reallocation) on the national, regional and global level (assessing farm size, land and water use and human resources, logistics etc.) with the specific focus on the effects of the supply structure on the local and national levels to changes in the consumption structure and, as a result, changes in external trade specialization on regional and global levels. The research makes clear, that structural changes in agriculture predominantly caused the changes in domestic nutrition and foreign trade. And the reasons for the structural changes in supply are located on the natural production conditions and access to input resources. At the same time the market demand depends on economic and less on consumer behavior and preferences.
Optimising integration of crop and livestock production systems of farm businesses in the Less Favoured Areas of England

Vittis George, University of Reading
Gadanakis Yiorgos, University of Reading
Mortimer Simon, University of Reading

Integration of crop and livestock production systems (ICLS) emerges as a solution for the sustainable development of agricultural systems. Diversification of agricultural production increases financial performance and resilience while minimising the negative environmental impacts. In the present study farm businesses located in Less Favoured Areas (LFAs) of England are being examined to investigate the impacts of conversion into more integrated systems on profitability. This analysis provides knowledge that can enable structural changes on the farm level towards enhancing profitability, environmental performance and provision of ecosystem services. Linear Programming (LP) modelling is employed, constructing four distinct optimisation scenarios in order to identify the different dynamics between specialised and integrated production systems. The study uses physical and financial data of 139 farm businesses for the accounting year of 2013-2014 derived from the Farm Business Survey (FBS). According to our findings many potential opportunities exist to increase financial performance of hill farms through optimisation of ICLS. Policy support may mitigate productivity challenges within the uplands developing networks of transferrable knowledge to enable farmers obtain knowledge on benefits emerging from integrated systems. Hence, promote strategies and risk mitigation practices that allow hill farmers to develop sustainable production systems maximising the production capacity of the available natural resources (i.e. land).
Poster Session

THURSDAY, 06 September 2018

Time: 18:30-19:00
The comparative study between two methods of date’s transformation

Benaissa Keltoum, Biskra University

Algeria has more than 200 cultivars of date fruits. Ghars variety is classified among the most important because of the area of growing. Ghars has a soft consistency and is consumed fresh but mainly in confectionery. The aim of this comparative study is to know the physico-chemical and microbiological changes of the paste of dates during storage. The two treatments studied are two dates pasta prepared by a traditional method and the industrial one. Our analysis concern some physicochemicals parameters considered as quality criteria for dates, namely: water content (humidity), pH, acidity, total sugar, ashes and conductivity. The microbiological test, we took samples of dates from the two treatments that are put in Petri dishes, then covered with a plastic film, the dishes are put in the oven set at 37 ° C for 3 days (72 hours). We note that the Petri dish of the second treatment (date paste T2) inflated which means the microbial activity, unlike the first treatment (date paste T1) which did not have this microbial activity. The comparative study that we carried out on the physicochemical and microbial parameters of two samples of date paste of different origin, allowed us to conclude that the difference in the acidity and the humidity of the studied treatments influences on the shelf life of products as well as the spread of microorganisms. The best results are those of the traditional method. This study needs to be pursued by physicochemical analyzes that will start from date sorting, during storage of the date paste until the product arrives at the household to ensure that the product is clean.
Study of Rhizobacteria isolated from Argania Spinoza
1. of Mostaganem Region

Medjahed Housseyn, University Center Nour Bachir El Bayadh
Medjekane Meriem, Laboratory of Natural Bio-Resources, Hassiba Benbouali University
Ait Kaci Mazari, University Center Nour Bachir El Bayadh
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The use microorganisms as inoculants in agriculture is one of the most promising approach to improve cultivated plants production and yield. The first step of our study was the isolation of the rhizobacteria from the rhizosphere of the argan tree of Mostaganem regions in Algeria, than the investigation of their power to boost the plants growth was done by the determination of AIA after purifying our iso-lates on King B medium. This step allowed us to select 41 bacteria approving concentrations of AIA higher than 13.5 μg/ml among 78 isolates. The highest rate of AIA was 56μg/ml. The productions of HCN and NH3 were also measured. In the second step, the isolated PGPRs were applied on seeds planting and their effects on plant growth by the germination test on the varieties SIMITO and ARZ representing durum and soft wheat respectively were examined. The germination rates were 47%, 55%, 25%, 56%, 68%, 64%, and 36% varying with bacteria. The finale step was a statistical study which confirm the power of our PGPRs on wheat growth with very satisfactory results. All the results were higher than the control however one of the bacteria gave the most interesting result with an average of dry root weight of 125 ± 4.08 mg leaves length of 110 ± 29.15 cm and rods length of 100 ± 33.02 cm.
How to get economic sustainability in olive groves: an analysis of consumer behaviour for extra-virgin olive oil

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The olive oil sector in Andalusia (Southern Spain) has grown substantially over the last two decades. Andalusia is by far the largest olive oil producing region in the world, producing more than 1.3 million tonnes of olive oil which correspond to 40% of world production and 83% of the Spanish olive oil on average. Therefore olive groves, due to their expansion and intensification, cover over 1.5 million hectares, that is, 16% of the total surface area of Andalusia and 33% of total farm land. This sector becomes key for economic sustainability of the region given that nearly 25% of total farm income comes from it and that one out of three farm jobs is related to it. In addition, olive groves are a biodiversity-rich habitat and prove a high nature value farmland. However, olive oil markets represent a paradigmatic example of a complex and mature agri-food market, where products that differ in term of intrinsic features become undifferentiated. To understand olive oil markets, it should be pointed out that far from being a generic product, the designation “olive oil” is shared for the three different market categories available for consumption. These categories differ in quality, composition and organoleptic properties, especially when comparing refined olive oil (ROO) and extra virgin olive oil (EVOO) categories. Both are completely different in the healthfulness state of the olives, degree of ripeness, post-harvest handling and manufacturing process all of which is translated into the intrinsic quality - organoleptic attributes. Nevertheless, this gap of quality is not reflected in the purchase behaviour of Andalusian consumers, resting added value to the sector. Obviously, on the basis of economic theory, relative price gaps between products could be a part of the explanation; but the price gap between EVOO and ROO has been on average around €0.35 kg−1 since 2007/2008 crop year. Considering the above-mentioned context, it becomes necessary to deepen in olive oil consumer behaviour, developing a theoretical framework by providing a more in-depth understanding of consumers’ decision-making processes in this sector. Consequently, the aim of this paper is examining how consumers build their purchase preferences based on person-related features and intrinsic and extrinsic attributes of the olive oil. In order to do so, a structural equation modelling with the partial least squares (PLS) algorithm was applied to a theoretical model. Results showed that attitudes to ROO and EVOO played a key role to explain the relative consumption of EVOO. In addition, factors such as product knowledge, brand equity of ROO, taste preferences, perceived price or consumers’ healthy habit are key to explaining consumer behaviour in such agri-food markets, where increasing consumers’ knowledge and creating consumer-based brand equity seem to be appropriate strategies to improve the differentiation process.
Regional impacts of certified apples

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The PGI apples of Kastoria and the PDO Zagorin apples are widely known and highly appreciated as high quality apples which are related to particular production region. The aim of the present study is to assess the economical-social-environmental impact of the apples in these two regions utilizing this called approach. More specifically, in both areas several dimensions have studied (pesticide use, emissions and pollutions, gender influence and income spending). Thus, a qualitative analysis was followed by using a structured questionnaire applied to 60 apple producers of the PGI Kastoria and PDO Zagorin and employing Content Analysis Model. This model enables identification of patterns and estimation of the relationships between the variables that analyzed. The results offer an illustrative picture of the effects of apple production upon economical-social-environmental variable in both regions and then a comparison is followed deriving valuable results for the noteworthiness of certified apples. Keywords: PGI Kastoria apple, PDO Zagorin, Triple bottom line, Content Analysis
Real-world impact of GIs: A review of the empirical economic literature

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The number of academic reports on GIs is large, a simple search for “geographic indication” in any scientific database results in hundreds of hits. However, these are mainly theoretical or conceptual analyses. Even the majority of the economic literature draws conclusions based only on theoretic discussions rather than empirical data. To the best of our knowledge, as far no study has attempted to synthesize the evidence based literature on GIs. Existing literature reviews of GIs focus mainly on the European system and give a general overview of the available resources, both in terms of methodologies and disciplines. Against this background, we have completed research updating current knowledge about GIs, focusing exclusively on empirically validated results. This literature review focuses on three main topics. First, how big is the market of the GI products worldwide, including the extent to which it is influenced by the European PDO and PGI products? Second, is there a price premium which results in an increase in net income for producers? Willingness to pay studies are also included in order to measure the demand side’s response to this approach. Last but not least the empirical findings of the GIs on the rural prosperity and regional development are collected. That work critically assessed the current state of knowledge as to these three topics thus providing a sound base for evaluating GI policy. Further it allowed us to identify the priorities for future research. Our results show the lack of available data for GI market size. Even in the European Union the last comprehensive study was conducted in 2010. On the other hand, there is a large body of research focusing on consumers’ willingness to pay attitudes towards GI and origin labelled products, but their findings highly differ based on the examined products and the region. Therefore, the price premium for GI products is not always evident. As to the regional development effects, the studies identified were mostly case studies so their findings are hard to generalize. Some cases show that a well-developed and maintained GI system can contribute to the prosperity of the producing area, but many cases show that introduction of a GI can generate even unwanted results under certain circumstances. This paper focuses on reviewing the willingness to pay studies. For many consumers there are a range of attributes across which there is a willingness to pay a premium for quality. Some of these studies compare willingness to pay for organic or locally produced as well as for geographically labelled food. These various attributes interact in complex ways. Understanding these interactions is crucial to identifying sound policies for sustaining and preserving agro-food chains and rural eco-systems.
Aggregate selective vegetable plate waste in 7 primary schools in Zagreb municipal and correlation between vegetable plate waste and food preferences

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Recent evidence has shown that inadequate fruit and vegetable (FV) intake in school children might be associated with higher risk of non-communicable diseases. Early intervention can increase the FV intake in children and reduce these risks. The aims of this study were: (1) to determine the amount of plate waste (PW) in schools, with special emphasis on vegetable intake, and (2) to determine the possible correlation between PW and food preferences in primary school children. Subjects and methods: The study includes 720 children aged 7 to 10, of which 48% were boys and 52% are girls, from 7 primary schools in Zagreb municipal. The data were collected from December 2017 until March 2018, which represents autumn/winter school menus, for 5 consecutive days in each primary school. The aggregate selective PW method was used to collect the amount of PW from lunch meals which include vegetables (soups, stews, salad or side dishes). Food preferences were assessed after tasting, using a five-point ‘faces’ scale (scores 1 to 5; 5 being the most preferable). Also, if the children didn’t finish the meal they were offered to choose the reasons why. Results: All of the schools have a daily lunch offer of at least one vegetable item or a complete meal comprising vegetables (soups, stews, salads or side dishes). The results show that the average amount of PW per day is 5.52 kg, 0.90 kg and 2.14 kg for stews and soups, salads and side dishes, respectively. According to the serving size the average PW for stews and soups was 44% per plate (118.6 g), for salads was 45% per plate (65.47 g), and for side dishes was 60% per plate (128.41 g). The average score for stews and soups was 3.8 ± 1.4, for salads was 3.5 ± 1.4 and for side dishes was 3.7 ± 1.5. There is a week negative correlation between PW and food preference rate (p=0.038, r=-0.337). The most common answers of why they didn’t eat the whole meal were: “I didn’t like the taste of the food”, “I cannot eat that much food”, “I don’t eat that food at home”. Conclusion: The preliminary results indicate that the large amount of PW originates from vegetable dishes, and there is a weak correlation with food preferences in primary school children. Hence, apart from food preferences there are other factors that affect PW and vegetable intake. These factors should be estimated in the future and could contribute to establishing the various effective strategies that will encourage lower PW and increased vegetable intake in Croatian primary school children. This project is funded by the European Commission - Horizon 2020 research and innovation programme “Strength2Food” under grant agreement No. 678024.
The Delphi technique as a tool for assessing the impact of public sector food procurement policies on the socioeconomic sustainability of rural territories: a review

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Several studies have used the Delphi technique and they have been widely published in the international literature, in the fields of businesses, industry, education and the agricultural sector. Although methodological reviews and critiques of the method are available in the literature, these give limited attention to the question of scientific merit and means of evaluation. The objective of the paper is to present an analytical overview of the Delphi framework and its applications in social and economic empirical studies. Particular focus will be given to the implementation of the method to evaluate the effect of quality and food procurement policies on the social and economic sustainability of rural territories. The role of the Delphi framework is significant as, getting the maximum use of feedback, it includes qualitative interviews with stakeholders and policymakers to build consensus among them, capturing their views and better monitoring policy requirements. The main goal is the maximum possible consensus from a set of individuals who are experts on a specific topic with the assistance of successive questionnaires that they are asked to complete. The methodology is based on quantitative analyses that usually result from the qualitative approach of the phenomenon that is being investigated. Its basic principle is that it involves multiple stages or different “rounds” of collecting the necessary data with the aid of questionnaires addressed to a group of experts. The questionnaires are linked to controlled feedback, with the main goal of making suggestions through the strong consensus of the participants. To achieve this, usually, the first round has a qualitative approach, while the rest is a form of assessment either with a Likert-type scale or with a ranking in order of significance of the statements/proposals. In the present case, the study engages circa 50 participants in 3 rounds. The main features of the method are the anonymity, repetition, controlled feedback and statistical analysis. Identifying the pros and cons of the technique will offer the background to evaluate the effect of quality and food procurement policies on the social and economic sustainability of rural territories. The Delphi method will be used in a modified form, to assess the above-mentioned impacts and identify the Strengths, Weaknesses, Opportunities, and Threats (SWOT matrix) that exist regarding policy recommendations. Getting the maximum use of feedback, an endeavor will be made, through qualitative interviews with stakeholders and policymakers, to build consensus among them, capture their views and construct a complete depiction of policy requirements. The procedure will offer the opportunity to participants to contribute actively and be a part of the policy-making process. The expected outcome of the present paper is to provide academia, participants and relevant stakeholders with a robust framework based on an analytical review to assess loopholes in the agricultural policy methodology, particularly for the Delphi technique.
FarmCircle project: Young farmers as Circles of a Circular Economy

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The overall aim of the Farm Circle project is to make farmers aware of new trends & business opportunities in bioeconomy to produce more added value per agricultural unit. The paradigm is to generate novel activities in compliance with the core farming activity. The Farm Circle project builds on the statement from an EU synthesis report of the EU25 analysis: “One of the key features of the bioeconomy is that it creates high expertise jobs, social and economic opportunities atypical for rural areas. It attracts young and educated families. Yet, it is vital to match the farm’s potential with the suitable technology and products, and ensure sustainability of the venture”. Specific objectives of the project are to organize existing materials from bioenergy and bioeconomy that fit farm characteristics into publically available training material, train the trainers and inform policy makers to focus supporting schemes towards demand in accordance with farm features. Building on the Partners’ expertise in vocational training at different fields, a multidisciplinary approach is used to satisfy the projects’ objectives. The FarmCircle project is co-funded by the Danube Strategic Project Fund under contract no. 09_ECVII_PA08.