UNISECO

UNDERSTANDING & IMPROVING THE SUSTAINABILITY OF AGRO-ECOLOGICAL FARMING SYSTEMS IN THE EU

UNISECO Project Workshop

13th and 14th November 2019, Basel

WP4 Scenario Development - Draft storylines

AUTHORS:	Elin Röös (SLU) Adrian Müller (FiBL) Andreas Mayer (BOKU) Karl-Heinz Erb (BOKU) Rob Hart (SLU) With input from all partners
APPROVED BY WORK PACKAGE MANAGER OF WP4	Karl-Heinz Erb (BOKU)
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1. INTRODUCTION

This document provides some background information on the scenario development process in the UNISECO project (Task 4.3) as pre-reading for the scenario workshop to be held in Basel on the 14th of November 2019.

The document contains:

- A short background on the use of scenarios
- Examples of recent scenario studies
- Short description of the scenario development process in UNISECO
- Draft versions of storylines to be developed further and modelled in the UNISECO project – to be discussed at the workshop in Basel

2. BACKGROUND

2.1. The use of scenarios

Scenario development and other foresight activities have the common goal of enabling a structured way of thinking about the future and enable effective decision making (Wiebe et al., 2018). Scenarios are descriptions of plausible, possible and desired futures that help investigate outcomes of different actions implemented today. The IPCC define a scenario as "*plausible and often simplified description of how the future may develop, based on a coherent and internally consistent set of assumptions about driving forces and key relationships*". Scenarios are also useful for engaging with stakeholders to increase knowledge and awareness of a certain issue and of outcomes of certain actions. They are also used for highlighting and discussing trade-offs and synergies, and handle conflicts of interest.

There are many different types of scenarios. A useful typology is that presented by Börjeson et al. (2006) which divides the scenario types into *predictive*, *exploratory* and *normative* corresponding to the following questions "What will happen?", "What can happen?" and "How can a specific target be reached?". Predictive scenarios try to predict what a likely future will look like, using for example historic data, and are most useful for planning purposes. A common assumption for predictive scenarios is that the existing governing systems stay constant within the period studied. When it comes to the agricultural sector, this could for example be agricultural policies and prices. A risk with predictive scenarios is that they can contribute to preserving past trends which might hinder desired goals. For example, predictive scenarios are often used for infrastructure planning based on historic data which might lead to increased investment in road infrastructure which often increase traffic and associated negative impacts instead of paving the way for alternative mobility systems.

In order to study how the future could develop, one can use exploratory or normative scenarios instead of predictive scenarios. Explorative scenarios are similar to predictive scenarios, but are to a lesser extent based on how the situation is today and instead provide alternative situations where major changes are possible. Normative scenarios are based on reaching a clear target (e.g. GHG reduction targets) in one or more areas. In order to realise exploratory or normative scenarios, larger trend breaks are often needed.

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2.2. Recent scenario work related to food and agriculture

Several scenarios have been developed that focus on the agricultural and land use (se e.g. Audsley et al. (2006), Stürck et al. (2018) and Wolf et al. (2015)). Recently, scenario development has also expanded beyond agriculture to take a food systems approach i.e. including both production and consumption in order to be able to determine how different aspects 'add' up on the regional scale, e.g. the whole of the EU. The importance of including the consumption level has become increasingly clear during the latest years in which several such studies using this approach have been published. For example, as organic production requires more land than conventional production, the impression could be that it would not be possible to feed the world on the existing cropland using organic production. However, this conclusion rests on the assumption that food consumption patterns stay constant, i.e. the same amount of food will still be needed. If consumption changes (which is the case when prices change), a number of options for high shares of organic production emerge, also without increasing land use. Conversely, if European organic agriculture expands and consumption does not change that would mean that agricultural production would be pushed into other regions, possibly creating negative effects there. Therefore, in UNISECO we aim at taking a broad food system approach. Below, two previous studies performed by UNISECO team members are shortly described.

A recent study from the Nordic countries used an extensive stakeholder process to develop scenarios of a future food system, including both production and consumption (Karlsson et al. (2017)). Researchers worked together with five NGOs over a period of a year to iteratively develop a vision for the future of food production in the Nordic countries (Sweden, Norway, Finland and Denmark). The final vision was based on organic farming and lower meat consumption with livestock fed on pasture and by-products from food production. Stakeholders designed the future food vision by pinning down for them important principles which were translated into consequences for the food system and hence the assumptions relevant for subsequent modelling. The researchers modelled the outcomes of such a scenario for the Nordic food system (in terms of land and energy use, greenhouse gas emissions, foods produced, N and P flows). The results were then shown to and discussed with stakeholders in several workshops and the scenarios were refined based on these discussions. Results were than disseminated mainly by stakeholders and used for communication and advocacy purposes e.g. at two COP-meetings and at several national seminars.

Muller et al. (2017) investigated how high shares of organic production perform regarding a number of environmental indicators covering land use, deforestation, GHG emissions, N and P surplus, soil erosion, pesticide use, cumulative energy demand and water use. They found that a switch to 100% organic production would result in large land use increases by 30% in comparison to a business-as-usual scenario from FAO for 2050 (while not increasing GHG emissions). If combined with additional strategies, such as a reduction in food-competing feed (i.e. feed from arable land: cereals, forage maize, etc.) with correspondingly reduced shares of animal products in diets, and with reduced waste levels, food systems with 100% organic production are possible, and feasible across all the indicators investigated. A particular challenge for high shares of organic production is nutrient supply, as mineral nitrogen fertilizers cannot be used anymore.

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A part from the above mentioned studies there has been an increasing number of similar scenario development studies have been performed, which all look into the future to predict or explore how future developments could look like. These have been reviewed in the UNISECO project and some will be used to the as input in the scenario development process.

2.3. Scenario development in UNISECO

Scenario development in UNISECO follow a 'story and simulation' approach (Figure 1). This means that stories (here after called story lines) that qualitatively describe possible future developments are first developed. A first version on such storylines are presented in section 3 of this document. To have more information as regards a range of quantitative parameters, for example greenhouse gas emissions, land, water and energy use etc. these storylines are then described and modelled in a wide range of scenarios that all describe in these futures in numbers. Results are again presented to stakeholders and their input used to refine the scenarios.

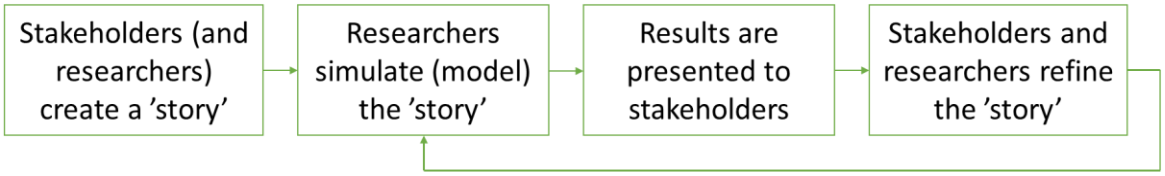

Figure 1: Scenario development approach in UNISECO.

Two biophysical mass- and nutrient-flow models – BioBam and SOLm – are applied to model the outcomes of the storylines. In these models the EU is devided into 254 regions (NUTS2-level) and the models are calibrated with general data and assumptions derived from the data collected and analysed in the case-studies. The aim of applying BioBam and SOLm is to understand the wider scale implications and feasibility of the diffusion of agro-ecological farming systems at different spatial scales and across a range of consumption levels. BioBam is spatially explicit and thus provides the basis for detailed spatial assessment and allows to integrate the impacts of land use change induced by the diffusion of AEFS. It covers (1) changes in the flows of biomass from cropland and grasslands and induced land use changes (2) GHG emissions from agricultural production including upstream flows and land use change (3) biodiversity pressures as indicated by the HANPP (human appropriation of net primary production) framework. SOLm follows a similar approach, it is however not spatially explicit, but relies on more detailed modelling of agronomic aspects of the production systems (e.g. for animal production systems with herd structures and correspondingly differentiated feed supply, nutrient excretion and emissions), thus providing the basis for detailed assessment of various production systems.

As mass- and nutrient-flow models, BioBam and SOLm do not include an endogenous decision structure, such as an assumption of profit-maximizing farmers. They serve to line out the option space of potential agro-ecological futures with a focus on potential synergies and trade-offs between different aspects. This allows to assess the biophysical viability of various storylines developed in participatory workshops without any restriction on how farmers may take their decisions on farm operations. Evaluation of the consequences of these scenarios in a political and economic context is thus not part of these two models but is assessed separately by complementary macroeconomic modelling. This then indicates how compatible certain scenarios in the option space are with common economic decision structures. This approach allows to very

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transparently analyse the system-specific trade-offs and synergies and to identify the option space - within which societally acceptable solutions then have to be found (using the participatory scenario development).

3. THE STORYLINES

3.1. Overview

The development of the storylines builds on the input gathered at two other stakeholder workshops; one held in Brussels in March 2019 and one in Helsinki in May 2019, and literature data (review of recent scenario studies). The storylines are also developed in an iterative manner i.e. stakeholders give input, researchers formulate the storylines, stakeholders give additional input, researchers refine storylines, check for consistency and so on. (The methodology for developing the storylines is described in detail in the full scenario development report - D4.2.)

The storylines are formed out of the following two uncertainties, which were identified as some of the main ones by stakeholders:

- Level of implementation of agroecological farming practises
- Localisation of food system (i.e. level of trade within the EU and globally)

Out of these uncertainties, four storylines are sketched as illustrated in the Figure 2 . The first one, Business-as-usual, extends the dynamics and criticalities of current agri-food systems and will highlight the policy barriers to the spread of agroecology. The second scenario, Agroecology-for-export, depicts a future in which medium-large agricultural farms and large companies in the food processing and distribution sectors promote the agroecological approach as a marketing strategy. This brings out the duality between niche markets and those of low-cost food. Hence, this storyline is a case of industrial ecology, in which a weak level of agroecology is widely implemented. As for the third storyline, Localisation-for-protection, it calls into question the centrality of the EU and emphasizes the risk of re-nationalization of agricultural policies. In this storyline, local foods, regardless of production methods, are given priority over agroecologial farming practise, why production practises remain similar to the current situation or further intensify. The forth storyline, reflects the more advanced stages of agro-ecological transition we are analysing in the UNISECO project. This future might be difficult to implement given the forces that today block changes including large agri-food companies and interests for the current structure of the CAP. A radical change will be needed to reach this future. The storylines are further described in section 3.2 to 3.5.

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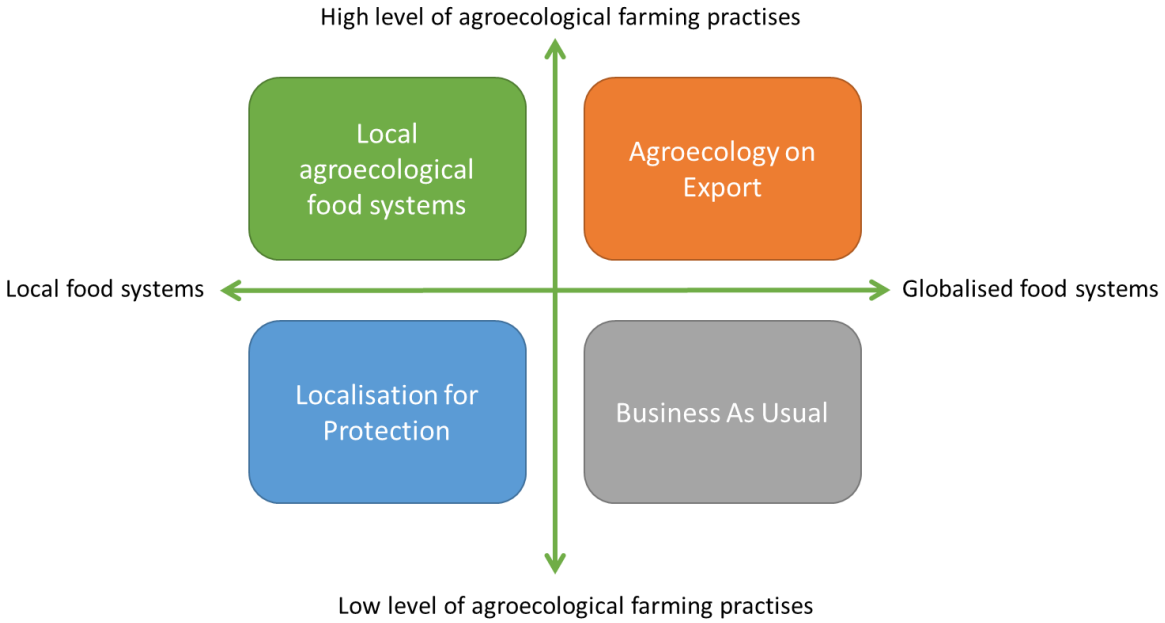

Figure 2: Storylines in UNISECO.

An overview of the main characteristics of the storylines are given in Table 1.

Table 1. Storyline overview

	Business-as-usual	Agroecology for exports	Localisation for protection	Local agro-ecological food system
Global socio-economic context	SSP2 – Middle of the road	SSP2 – Middle of the road, or SSP5 - Fossil-fueled Development – Taking the Highway	SSP2 – Middle of the road, or SSP3 - Regional Rivalry – A Rocky Road	SSP1 - Sustainability – Taking the Green Road
Agricultural policy developments	A continuation of current policies	A continuation of current policies, but with a heavy focus on investments to expand exports.	A continuation of current policies, but a less centralised CAP	Integrated food policy, heavy focus on local agroecological food systems
Trade	Increased trade between member states and with non-EU countries	Even higher level of trade compared to the BAU-scenario	Decreased trade between members states and with non-EU countries, protective trade policies	Decreased trade between members states and with non-EU countries, protective trade policies
Land farmed using agroecological practises	On average between member states: 5-15%	On average between member states: 20-50%	On average between member states: 5-15%	On average between member states: 20-50%

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Type of agroecological practises	Mainly weak	Mainly weak	Mainly weak	Mainly strong
Diets	As now, develop according to current trends	As now, develop according to current trends	As now, develop according to trends, but with more local foods	Less impacting (reduced animal consumption), more local foods
Food waste	As now, or slightly decreased	As now, or slightly decreased	Slightly decreased	Decreased by 25-50%

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3.2. Scenario 1: Business-as-usual

Globalised food systems - low level of implementation of agroecological farming practises

This scenario describes a BAU situation in which globalisation of the EU food system continues[1]. In this system, farmers are incentivised to produce low cost commodities leading to specialisation of farming systems and regions.

Current production and consumption trends continue as described by the EU Agricultural Outlook[2] which assumes:

"• a continuation of current agricultural and trade policies;
• normal agronomic and climatic conditions;
• no market disruption".

In summary, the outlook is as follows: The utilised agricultural area will continue to decrease by 0.2% per year reaching 172 million ha by 2030. Although total sugar consumption decreased by 5% by 2030 as a result of increased health concerns, total sugar production increases by 12% by 2030, making the EU a net sugar exporter. Cereal production also increases to 341 million tons by 2030 while oilseed production will decrease due to decreased demand for biofuels. The production of feed is expected to rise due to increases in poultry, dairy and intensive beef production. Dairy exports to China are expected to increase considerably - EU supplying 30% of the increase in dairy products mainly as cheese and skimmed milk powder. Dairy consumption increases also within the EU up to close to 900,000 tons of milk per year, mostly consumed as cheese, other processed dairy products and included in convenience foods while milk drinking decreases. Meat consumption per capita first slightly increases but will decrease again to current levels again in 2030. Beef production decreases slightly while pigmeat will increase marginally (consumption in the EU stabilises and exports increase somewhat). Poultry meat production increase by 5% until 2030.

It is assumed in this scenario that the same trends continue beyond 2030 until 2050.

The consumer interest in healthier and more sustainably produced foods including organic foods and locally produced foods increases somewhat. However, due to lack of major public investments in or support of the implementation of agro-ecological farming methods, these remain close to current levels (the share of organic farming area was 6.7% in 2016[3]) or increase slowly (reaching an average of somewhere between 5-15% of agricultural land in 2050). Certified organic products, produced using mainly weak agroecological practises, dominate the output from the agro-ecological farming systems; these come in form of high-value products like wine and other alcoholic beverages, cheese and charcuteries, jams and juice etc. sold in niche

[1] The organisation of the EU food system is in this scenario well described by Therond et al. (2017) socio-economic context for farming called "Globalised commodity-based food systems" in which increasingly efficient industrial processes are used to "*produce large amounts of food that are inexpensive, convenient, safe and attractive*".

[2] https://ec.europa.eu/agriculture/sites/agriculture/files/markets-and-prices/medium-term-outlook/2017/2017-fullrep_en.pdf

[3] https://agridata.ec.europa.eu/extensions/DashboardIndicators/OrganicProduction.html

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markets to high-income urban citizens, as well as cheaper bulk commodities sold in ordinary supermarkets. Diversity in crops produced are constant from current levels or somewhat further decreased[4].

In this scenario, trade increases both between member states and between the EU and global markets - specialisation in production in different regions continues. A few multinational food industries dominate the global food market. Diets and the range of products on offer become increasingly homogeneous. Obesity levels continue to rise as does its associated health problems.

Agricultural policy (which remains very similar to the current CAP) continues to drive specialisation, large-scale and export-oriented agricultural production. The EU budget is somewhat decreased due to Brexit; however, most member states push for keeping the EU agricultural budget constant and rather decrease expenses in other areas. The agricultural policy landscape is similar to today, Pilar 1 has low requirements for greening. Although Pilar 2 includes support for e.g. organic production and other agro-ecological practises, variation in the implementation rate of such agro-environmental policies is large between countries, efforts uncoordinated and only half-heartedly supported by national governments and the EU. There is a constant discussion on the ability of agroecology to "feed the world" and a push from large multinational agro-chemical and seed companies to implement more industrialised types of agriculture. Any policy on the demand side, like taxes on unhealthy or high-impacting foods, restriction on advertisements and similar, have been effectively counteracted by powerful lobbying groups. Food waste levels remain similar to current levels or decrease somewhat in countries in which waste reduction policies are implemented.

For the Business-as-usual scenario, please reflect upon the following questions:
In what way (if any) do you find this scenario interesting and relevant?
Answer:
Do you find this scenario plausible i.e. could the future develop in this direction? Are there current evidence of developments in this direction in your country? Please add examples in that case.
Answer:
As the scenario is described now do you see any major inconsistencies?
Answer:

[4] Following trends in Kummu et al (2020)

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What kind of policy developments would be likely in this scenario? Please give examples of current or possible policy instruments that would fit in this scenario.
Answer:

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3.3. Scenario 2: Agroecology for exports

Globalised food systems - high level of implementation of agroecological farming practises

In this scenario, food systems are becoming increasingly globalised with high trade both within the EU and across the globe. However, strong support for and investment in agroecology has led to a large increase in land managed using agroecological practises in the EU, reaching somewhere between 20-50% in 2050. The main driver for this development has been using agro-ecological approaches as a means to produce high-value foods for exports between member states and also to the BRICs countries where a growing middle class is demanding "clean and healthy" foods. However, most trade is performed within the EU, i.e. recent strong trends of e.g. Spanish exports of organic products such as fruits, vegetables, wine, oil and nuts, continue due to the strong boom in the demand by consumers from the middle-northern countries of Europe.

Several export-oriented policies and initiatives have been put in place to take advantage of this opportunity[5]. Most agroecological farming systems are more of the substitution, rather than the redesign, variant - policies focus mainly on the substitution of problematic inputs. Products are sold on global markets under different third-party verified certification schemes[6]. Apart from increased investments in export oriented strategies, the agricultural policy is similar to that of today. However, payments for certified organic farming and other similar certifications that has export market value are increased. In this future, small-scale agroecological producers have a hard time competing with large companies that have a much great capacity to invest in heavily marketing of 'greener' products.

Large-scale farms dominate on both the conventional and agroecological side in Europe as most commodities are traded on the EU or global market, which requires large scale production that can deliver stable volumes to large food industries and markets. Infrastructure and other support for local markets is not prioritised, an additional reason for small-scale farmers going out of business. Imports into the EU of low-price bulk commodities like soy for feed, palm oil and wheat increase to supply low-price food to large low-income population groups in the EU. (Alternatively: EU states require implementation of sustainable farming practises (e.g. in trade agreements) in countries from where we import so that agro-ecological farming practises are stimulated also outside the EU.)

The diet composition develops according to current projections but with large variations between income groups. Current developments with low-income populations struggling with diet related diseases due to poor diets continue while high-income populations improve[7]. That is, we see a highly segmented food

[5] See for example Danish goverments investments in export activities related to organic foods. https://www.foedevarestyrelsen.dk/english/SiteCollectionDocuments/Kemi%20og%20foedevarekvalitet/Oekologiplan%20Danmark_English_Print.pdfc

[6] An example of this being a plausible future development of EU agriculture is the Swedish food strategy launched in 2017 which suggests increased organic production (goal for 2030 is 30% of agricultural land), including exports, to increase rural employment and economic growth.

[7] https://academic.oup.com/ajcn/article/87/5/1107/4650128

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market in this scenario in which anonymous agro-ecological products are consumed by the informed well-educated populations and exported outside the EU. Food waste levels remain similar to current levels or decrease somewhat in countries in which waste reduction policies are implemented.

For the Agroecology-for-export scenario, please reflect upon the following questions:
In what way (if any) do you find this scenario interesting and relevant?
Answer:
Do you find this scenario plausible i.e. could the future develop in this direction? Are there current evidence of developments in this direction in your country? Please add examples in that case.
Answer:
As the scenario is described now do you see any major inconsistencies?
Answer:
What kind of policy developments would be likely in this scenario? Please give examples of current or possible policy instruments that would fit in this scenario.
Answer:

https://www.cambridge.org/core/journals/british-journal-of-nutrition/article/prospective-associations-between-socioeconomic-status-and-dietary-patterns-in-european-children-the-identification-and-prevention-of-dietary-and-lifestyleinduced-health-effects-in-children-and-infants-idefics-study/CAD97E2AC8B25B513F5D8C9797D2BCD1

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3.4. Scenario 3: Localisation for protection

Local food systems - low level of implementation of agroecological practises

In this scenario, we see a development in which nationally or locally produced foods, regardless of production methods, are prioritised over foods produced in agroecological farming systems. In some member states, this development is partly a consequence of a continued rise in nationalism and protectionism. Some countries are also experiencing discontent with EU membership and aim for a greater independency (cmp. Brexit). Global trade wars and global political tendencies for less international cooperation and increased competition between regions (SSP3), add to this sensation of the importance of self-sufficiency in food supply. In the wake of this, member states are putting policies in place to promote more national food production, backed by arguments like decreasing the dependency on imported foods e.g. to be prepared for cut-off situations due to conflicts, interruptions due to trade wars, or just to support local farmers[8]. In other member states, nationalism is not as pronounced and support for continued EU-cooperation (including a large-budget CAP) is strong. However, these countries are also affected by the global political situation and strategies for food production emphasize the need for high level of self-sufficiency and independency from large food imports. Many countries look to Finland for inspiration. Finland has managed to maintain high market shares for Finnish products due to explicit goals, strategies and policy investments into strengthening the competiveness of Finnish farming and the promotion of Finnish foods[9]. In some member states, local production is also increasingly supported by environmental concerns, focussing for example on reducing food miles[10].

In terms of agricultural production, focus is on increased production of bulk commodities and continued growth of the agricultural sector to supply primarily the national population, but also to achieve gains on the world market through exports to countries mainly outside the EU. Although the national/local food is commonly marketed as more sustainable (and perceived as such by consumers) concern for environmental impacts is in general subordinate. Local production, regardless of production practises, is prioritised over production practises implementing agroecology or other more sustainable ways of farming, which are often seen as in-efficient use of land. The influence of multinational agro-input and food companies has remained strong but their influence has gradually decreased for a number of reasons. In countries with nationalist influences for example, people are increasingly suspicious and negative towards anything that relies on cooperation across countries and tend to prefer buying from national companies. New national food companies therefore arise and existing ones are strengthened - however power in the food chain continues to be concentrated to a few large food industries and retailers in each country. Due to the focus of national food production and nationalistic trends, local food cultures thrive in many countries, at least in TV-shows, ads and online recipes. Still, most citizens continue to eat a high environmental impact diet with high levels of animal products, as there are few consumer side policies put in place to steer consumption and continued

[8] Example from Sweden of a municipality which might abandon their policy to purchase organic food in favour for locally produced and seasonal foods. https://www.sydsvenskan.se/2019-10-28/lunds-kommun-kan-helt-stryka-krav-pa-ekologisk-mat?redirected=1&fbclid=IwAR0KxVmGLKlvIn53HCMX8wqMVNFWO_KPpMBjWZ51mVYlv3c_v5qMmDdfV1o

[9] https://mmm.fi/en/food-and-agriculture/policy/food-policy

[10] https://www.euractiv.com/section/agriculture-food/news/sr-agri-local-zero-kilometre-products-start-to-take-spain-by-storm/

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investments and support for continued intensive livestock production. Food waste decreases slightly due to somewhat higher food prices.

The implementation of agroecological practises remains low or increase slightly (maximum 15% of agricultural area in 2050) to support mainly three niches of citizens; 1) those who oppose current nationalist trends and relentlessly, but not very successfully, continue to fight against environmental pollution, 2) those that use nationalist arguments for "saving our national environment" and therefore see an interest in agro-ecology[11], and 3) rich consumers outside the EU. Agroecology is limited to weak agro-ecological practises as the focus on high-yield is prevailing in the agricultural discourse. There is a strong push to intensify national agricultural production (both in fertile and marginal areas) with the demand for increased food output overruling objectives to reduce environmental pressures.

Due to the conflicting views on the EU institution across member states the centrality of the EU CAP and the contrasting re-nationalization of agricultural policies is heavily debated. The EU has continuously been losing centralised power, however, there is still a common agricultural policy in 2050 but with a smaller budget and member states are left to make most decisions on how this is to be implemented i.e. EU-level policies are weak. Member states keep agriculture strongly protected and financially supported and deregulate agriculture as much as possible to be able for the national agriculture to compete. Member states manage to keep up with the international competition due to mainly protective trade policy but also by consumer willingness to pay a considerable price premium for domestic products, although to a lesser extent. On the demand side, most countries implement policies to promote consumption of local foods e.g. requiring that public meals are "based on local traditions" and made out of domestically produced commodities and information campaigns to promote locally grown food. Member states find creative ways to put up trade barriers between member states referring to health effects etc. There are an increasing amount of publically funded projects and initiatives to support local production, including labelling schemes[12] and policies to support short supply chains.

For the Localisation-for-protection scenario, please reflect upon the following questions:
In what way (if any) do you find this scenario interesting and relevant?
Answer:
Do you find this scenario plausible i.e. could the future develop in this direction? Are there current evidence of developments in this direction in your country? Please add examples in that case.
Answer:

[11] Potentially this organisation is such an example http://www.ecopop.ch/de/

[12] E.g. http://euskolabel.hazi.eus/es/

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As the scenario is described now do you see any major inconsistencies?
Answer:
What kind of policy developments would be likely in this scenario? Please give examples of current or possible policy instruments that would fit in this scenario.
Answer:

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3.5. Scenario 4: Local agro-ecological food systems

Local food systems - high level of implementation of agroecological farming practises

A rapid increase in climate and environmental concerns among large population groups in the EU and fierce campaigning for stricter policies to prevent climate and environmental breakdown drive change in this scenario. The first sign of this development was seen in the 2019 election to the European parliament when the green parties increased their mandates by 40%.

A common EU policy on sustainable food systems based on agroecological practices, much influenced by the iPES report[13], has been put in place and has been largely adopted by most member states in the year of 2028. The focus of the food strategy was on establishing more localised agro-ecological food systems to overcome multiple problems including nutrient and chemical pollution, soil erosion and soil carbon loss, high use of antibiotics and poor animal welfare and to enhance social sustainability by promotion of more small-scale and diverse farming and food production practises. Different types of alternative food systems are rapidly expanding including different types of community supported agriculture and short supply chain/direct sales based on online systems. To enable more localised food systems, support is also given to the establishment of small-scale processing. Farmers are also offered increased protection from the competition of low-cost third country imports by first industry and retail, then trade agreements, implementing sustainability criteria. In combination with, and actually proceeding the changes in policy, many member states experience an explosion in bottom-up initiatives fostering agroecological farming practises and local food systems. Local town councils and regions play an important role here.

As for the CAP, this is now handled under the umbrella of the food policy and has in 2050 radically changed. Already in the 2030 there are systems in place for e.g. Results Based Payment Schemes and such system are largely expanded between 2030 and 2050. Greater consumer awareness is achieved by coherent marketing campaigns, and with the dissemination of clear, accurate and complete information about the benefits of agroecology and their production systems for society. Programs for knowledge transfer among practitioners and producers in rural areas have also been implemented and are available for most farmers. The investment in agroecology is also used as a strategy to adapt to unavoidable effects of climate change. Pilar 1 support is hence reformed from purely area based to being based on several sustainability criteria. One important example is the recognition of the inefficiency of feeding human edible crops to livestock which led to the implementation of incentives to feed ruminants more grass and forage and the rapid rise in poultry production to level off. Intensive pork production also decreases.

The concept of locally adapted agro-ecological food systems in this scenario also includes striving for more healthy and sustainable consumption patterns. This includes a view that excess intake of “unnecessary” unhealthy foods (sugar-sweetened foods and beverages), excess consumption of livestock products, especially from animal species consuming human edible feed (i.e. pigs and poultry), and excess intake of food in general is a waste and should be prevented by powerful policy measures[14]. As should of course

[13] http://www.ipes-food.org/_img/upload/files/CFP_FullReport.pdf

[14] For example, taxes on unhealthy foods and policies that steer away from using grains for animal feed.

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ordinary food waste which is reduced between 25-50% mainly as a result of food becoming more expensive but also through a range of different policies. The EU common food strategy includes an initiative to make policy on the demand and production side consistent, directing the CAP support towards the production of foods desired in a healthy and sustainable diet. As suggested in the iPES-report, in order to receive CAP funding member states have to develop and implement certain health promoting policy such as fiscal and social policies to promote healthy eating.

An important success factor of the rapid transition to strong agroecology at a large scale has been industry's' commitment and involvement in the new food strategy. Driven initially by consumer demand[15] and as a result of the general discourse, food industries started to work actively with farmers to enable the implementation of agro-ecological schemes and then bit by bit incorporated this into their company strategies[16]. In 2050, on average across member states between 20-50% of land is farmed with strong agroecological practises serving mostly local markets.

For the Local-agroecological-food-systems scenario, please reflect upon the following questions:
In what way (if any) do you find this scenario interesting and relevant?
Answer:
Do you find this scenario plausible i.e. could the future develop in this direction? Are there current evidence of developments in this direction in your country? Please add examples in that case.
Answer:
As the scenario is described now do you see any major inconsistencies?
Answer:
What kind of policy developments would be likely in this scenario? Please give examples of current or possible policy instruments that would fit in this scenario.
Answer:

[15] Example of recent developments of consumers driving change: https://www.politico.com/news/2019/10/10/food-industry-consumer-brands-association-043892

[16] Dairy company Danone is an example of a large multinational company already promoting agro-ecology, in their case under the concept of "regenerative agriculture" https://www.danone.com/impact/planet/regenerative-agriculture.html

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