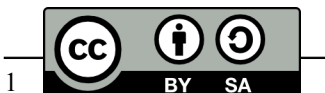


**ÉPoIAr
Écologie Politique
en Armorique**

What do we want to eat in 2050?

A prospective creative writing workshop¹

Booklet for participants



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Thank you for participating in this writing workshop. This handbook was designed to introduce you the Agrimonde Terra foresight study and to contribute to your reflection about land use and food production and consumption in the future.

Presentation of ÉPoIaR:

The collective, based in Rennes, aims to practice and promote political ecology, a reflection on the climatic and ecological upheavals that our planet is experiencing, fed by cross-disciplinary sources of knowledge and practices. It brings together researchers from agronomy, art and design, computer science, economics, environmental science, history, linguistics, literature, and mathematics to work together to understand how humans as organised societies can analyse these upheavals and adapt to mitigate their effects. Our ambition is to create opportunities for academics and non-academics to share their knowledge and skills so that, together, they can examine these important issues and collectively imagine desirable solutions and possible ways to achieve them.

You can find information about the collective on our site:

epolar@hypotheses.org

and on the site of the Institute for humanities and social sciences in Brittany:

<https://www.mshb.fr/écologie-politique-en-armorique>

Presentation of the workshop

One of the fundamental needs undermined by the current ecological crises is food. In concrete terms, it is a question of feeding 8 billion human beings in 2022, but probably 10 billion in 2050 and 11 billion in 2100 (according to the UN World Population Prospect published on 11 July 2022, see the "World Population" page on Wikipedia). Today, we are asking the question:

"What kind of food do we want / will we have in 2050 and how can we use the land to produce it?"

The workshop is an exploration of the future through writing. Exploration, not prediction. We are going to write in order to make what we imagine happen.

The foresight approach was inspired by a classical method in science which consists in giving oneself a set of scenarios to better study the future evolution of an aspect of the world. Knowing that the future is uncertain and that the possibilities are infinite, we set ourselves a small number of contrasting scenarios in order to represent this range of possibilities. This approach can be found in the IPCC scenarios for the study of climate or in those of ADEME to explore our capacity to achieve carbon neutrality by 2050 in different modes of society.

What are foresight studies?

"I had been working on the future for over twenty years. In twenty years, what misunderstandings! How many times had I had to make it clear that foresight, while it did have the future as its subject of study, was in no way divination. [...] What foresight was not, I knew by heart - but what was it? What foresight was not, nothing more simple.

Foresight was not clairvoyance. It was not premonition or prophecy. It is in no way a prediction, nor even, and this is the minimum level generally expected, a forecast. No, strategic foresight does not describe the future. The future, simply, is its subject of study, and we have, to explore it, an extremely elaborate methodological toolbox [...] We do not seek to predict the future, simply to prepare it, which leads us to consider the future not as a territory to be explored, but as a territory to be constructed. It is to the French philosopher Gaston Berger that we owe the essential idea of foresight that the future is inextricably linked to action." JP Toussaint. The USB key, Éditions de Minuit, 2020.

Summaries of the Agrimonde Terra scenarios

This workshop will be based on four Agrimonde Terra scenarios that have been used by economists to sketch out food security and land use challenges for 2050. These are obtained by making assumptions about the determining factors. What political structure do we favour? Has global warming stabilised? What diet has become established? Has urbanisation intensified? Which farming and livestock systems have been favoured? The aim of the research is then to produce inferences about the food security, health, and the environmental impact of agriculture in each scenario.

In their report, the Agrimonde Terra experts looked at 7 scenarios of which we have selected 4. We have renamed them to make their titles as meaningful as possible: 'metropolization and agrobusiness', 'healthy diet and international cooperation', 'regional food systems' and 'rural communities in a fragmented world'. To get an initial idea, we can think of the "metropolization and agrobusiness" scenario as an extrapolation of certain current dominant political, economic and cultural trends. It is a question of trusting the financial markets and relying on technological advances to keep the system afloat. International cooperation is good and bad, with each country

acting only when it is in its interest. Highly processed food and high animal product content contribute to health problems.

Scenario 2 "regionalized food systems", in a world organized in large regions, is based on majority trends. Here the regions refer to groupings of countries and not to the regions drawn in France for example. It could be the territory of the EU for example, Latin America, or just Western Europe. Binding agreements and arrangements exist for large-scale agricultural resource management. People eat better than today, but the political division of the world introduces imbalances between regions. Some become dependent on others to ensure food security for their population, and conventional and intensive practices are not fully phased out.

Scenario 3 "healthy nutrition and international cooperation" is an optimistic scenario that breaks with the current dominant trends / but is based on weak signals. All countries have agreed on a common policy for sustainable lifestyles. People eat well and to their hearts' content thanks to the proper application of dietary knowledge and through the virtuous use of technology.

Finally, scenario 4, "rural communities in a fragmented world" depicts a world that is politically and economically fragmented as a result of numerous crises. The communities are also not necessarily on the scale of a village and can extend over counties, for example. But the idea of this scenario is that if we have arrived at a fragmented political system, it is because we can no longer agree on a larger scale and therefore things are not going so well. In particular, trade is not sufficient to guarantee food for all, crises occur and the quality of our food will vary greatly from one year to the next.

Of course, all these assumptions are debatable. It is necessary to discuss and criticise them, and even to construct new ones. They have made it possible to carry out a scientific analysis of food issues up to 2050. However, they have not said much about what we are less able to measure, such as people's personal and collective experiences of living in such systems. It is to imagine these experiences that we present you this writing workshop, so we can use this foresight study to ask ourselves the question: What kind of world do we want to live in?

You can read the full Agrimonde Terra report here :

<https://hal.inrae.fr/hal-02788500/document>

Summarized versions of the report are available here :

<https://www.inrae.fr/actualites/prospective-agrimonde-terra-usage-terres-securite-alimentaire-mondiale-2050>

In the following pages, we provide tables and diagrams summarising the hypotheses and scenarios presented in the foresight study and used for the writing workshop.

“Global Context” hypotheses

Hypothesis	Ref.	Presentation
Sustainable and cooperative world	p. 95	Major rupture : States cooperate amongst themselves and with businesses, civil society organizations and international institutions. Strong commitments towards mitigation of climate change, regulation of the nutritional quality of food products, health, shift to green and collaborative economy. People-centre policies. Moderate economic growth. Trade liberalized but regulated. Participative research, innovation is technological, social and organizational. Inequalities are reduced.
Regionalization and energy transition	p. 95	States form large, supranational blocs to face recurrent crises and to implement ‘food sovereignty and subsidiarity’ principle. Regions use own energy resources and try to limit energy consumption. Economic growth is moderate with limited intra-regional trade. Countries network to improve education and research.
Economic and political fragmentation	p. 98	Monetary and financial crises, access to energy reduced in some regions, political instability aggravates economic difficulties and leads to internal conflicts in some countries. Economic growth low, huge differences within and between countries. Informal economy widely developed ; trade limited to neighboring countries. Education informal yet efficient, with exchange and sharing of experiences; similar trend for healthcare. Local communities of farmers organize themselves to share and manage use of resources.
Conventional development led by market forces	p. 98	Alliance between multinationals + investments funds + international institutions. Economic growth based on low-cost fossil fuel. Faith in technology and education to overcome limited resources. Considerable progress but accidents effect health and the environment. Large national and global inequalities. Increasing number of catastrophes. Energy prices rise sharply, resources increasingly rare, fierce competition over water. Public health deteriorates due to pollution and unhealthy diets. Migrations from resource-poor countries to richer ones are very large.
Dominance of non-state actors	p. 99	People join transnational interest groups (NGOs, civil society organizations, etc.) in coalitions facilitated by urbanization and information technologies. These groups bypass national jurisdictions and regulations. Their power brings greater global wealth but generates geopolitical uncertainty. Energy production is decentralized. Large inequalities. Confidence in researchers’ capacity to find solutions to challenges faced by world.

“Climate change” Hypotheses

Hypothesis	Ref.	Presentation
Stabilization of Global Warming	p. 109-110	<p>COP21 ambitious targets for 2100 create momentum towards strong mitigation efforts:</p> <ul style="list-style-type: none"> - Carbon tax, low-carbon standards, etc., - Moderation and energy efficiency, - Carbon capture and sequestration, - limitation of land degradation... <p>As a result, global temperature changes well below +2 °C in 2100 and +1 °C in 2050, limited changes in precipitation. Crop yields and crop protein content not significantly affected by climate change in temperate and tropical zones. No notable change in area of cropland suitable for agricultural production.</p>
Moderate warming	p. 110-111	<p>Collapse of international government system, climate change mitigation co-benefit of adaptation measures, as well as reduced food and energy consumption due to lower economic activity and/or energy independency strategies. Strong rise in bioenergy production in regions without abundant fossil fuels.</p> <p>Global temperature +2 °C in 2100 (+1 °C in 2050) changes in precipitations to +0,08 mm/day. Discernible impacts on agricultural system. Average yields decrease, more so in tropical regions. Average suitability of cropland decreases moderately. Frequency of extreme weather events increases.</p>
Runaway climate change	p. 110-111	<p>International agreements are not enforced and do not lead to significant effective emission reductions. The world’s economies remain dependent on highly available fossil energies (new sources, reserves in the Arctic...). Conventional development model for agriculture.</p> <p>Global temperatures rise to +4 °C in 2100 and +2 °C in 2050. Changes in precipitations amount to +0.15 mm/day. Strong impacts on agricultural system: area of cropland suitable for agricultural production increases but is unevenly allocated. Average suitability of cropland areas and yields decrease. Extreme climate events more frequent and CO₂ and O₃ concentrations have direct impact on crop yields and protein content of crops.</p>

“Nutrition and diets” Hypotheses

Hypothesis	Ref.	Presentation
Transition to diets based on ultra-processed products. Global convergence based on transnational value chains.	p. 133	Nutrition transition and deployment of transnational value chains in developing countries drive a convergence of diets worldwide and a significant increase in energy consumption. Increased consumption of vegetable oil, refined cereals, processed meat, added sugars and salt. Strong convergence of diets worldwide, consumption of energy-dense and micronutrient-poor highly processed products. Increase in obesity, diabetes, cardiovascular disease, some forms of cancer. Declining dietary diversity for the poor.
Transition to diets based on animal products. Urbanization of diets and eating styles.	p. 135-136	Improved incomes in urbanized areas, increased reliance on food services, reduced incidence of meals at home. Diet characterized by high consumption of meat, eggs, dairy products, fats, processed foods, added sugar and salt. High calorie consumption combined with low levels of physical activity lead to of obesity and diet-related diseases. Food inequality increases, disadvantaged populations vulnerable to price variability and undernutrition in rural areas lacking access to food markets.
Healthy diets based on food diversity. Dietary practices promoted by nutrition policies.	p. 136	Public health policies implemented at global and national levels to reorient consumption towards healthier and more diversified diets and address issue of malnutrition. Limitations on trade in energy-dense ultra-processed products. Measures implemented: health education, subsidies/taxes to reconfigure food systems. Diets more balanced and diversified in developed countries (+ fruit, vegetables, pulses, coarse grains ; – animal products). Variety of foods and increase in calorie intake in developing countries helps address challenges of undernutrition.
Regional diversity of diets and food systems. Re-regionalization of supply chains and maintenance of regional diets.	p. 136	Regional supply chains reshaped, reconnecting diets to regional food crops. Stabilized consumption of cereals, coarse grains, tubers and roots as basis of diets. Significance of each product depends on world region. Traditional value chains, more or less hybridized with supermarkets or agribusiness, keep pace with contemporary developments, yet value culinary culture. Obesity and diet-related diseases stable since 2010. Undernutrition reduced due to impact of supply chain developments on incomes of rural households.

“Urban-Rural Relations” Hypotheses

Hypothesis	Ref.	Presentation
Large metropolitan region with a spatial rupture to rural hinterlands.	p. 152	Population concentrated in large urban centres, particularly in coastal areas. Standardization of lifestyles, consumerism dominant, regional or family solidarity weakened. Interweaving of urban and rural activities. Large cities connected via international trade to some far away rural areas. Global decline in agricultural employment due to migration to urban areas. Some farmers have no, or difficult, access to food value chains and urban consumers. Households rely on purchase of food items available through national or international markets.
Multi-local and pluriactive households in a rural-urban archipelago.	p. 152-153	Farming remains core activity in rural households, now as one of multiple, specialized, activities. Rural incomes diversified. Circular and temporary migration due to uncertain urban growth. Mobility between urban and rural areas for employment in secondary or growing cities or seasonal agricultural work. Food strategies of households combine self-consumption, supplies from regional or international markets and supplies through family networks.
Rural areas integrated within urban networks through value chains	p. 153	Multipolar urban organization powered by population growth and rural migration. Development of secondary urban centres in relation to larger cities leads to reconfiguration of rural areas. Rural households diversify activities including processing and marketing of agricultural products. Household food strategies rely on diversified foods, with traditional products consumed in the region retaining an important place.
Urban fragmentation and counter-urbanization	p. 153	The end of rural migration to cities linked to congestion problems, unemployment, pollution and lack of access to housing and basic services. Result is population growth in small towns and medium cities, urban fragmentation, counter-urbanization. In some regions of developing world, increase in rural populations leads to reagrarization and decline in farm size due to pressure on land. ‘Food deserts’ develop and food supply is provided mainly by informal sector, relying on community and family networks.

“Farm Structures” Hypotheses

Hypothesis	Ref.	Presentation
Marginalized farms for livelihood survival	p. 173	Farmers are poorly integrated geographically and socially, excluded from markets and off-farm jobs, neglected by national policies. Their number expands. Production factors are weakly segmented, access to credit is poor, land rights are insecure. Family members provide farm labour. Production is mainly for subsistence but does not cover needs. Raising farm animals, at least poultry, common strategy to seek food security. In some regions experiencing economic crisis, some urban dwellers move to rural areas, attracted by farms which function as a refuge to avoid poverty.
Hit and run strategy for agro-investments	p. 173-175	Growing population, globalization, climate change, high demand for energy biomass and animal feed make hit and run agro investment financially attractive. Brokers negotiate with financial investors to buy or rent land which is cultivated by hired labour or machinery service providers. Brokers and engineers operate as farm managers. Commodity prices are volatile, contracts rapidly broken, agro-project partners can easily change. Priority given to returns but ignores common goods such as soil fertility and biodiversity.
Independent farmers but commercial dependency	p. 177	Small farmers sign contracts with private or public firms who purchase products and may also supply inputs, run processing operations, provide storage, marketing and distribution services. Exclusive relationships put farmers in dependent position while they also bear inherent climate and pest risks. This hypothesis favors specialization of production and homogenization of farming practices and market outlets. It also results in a concentration of leading agribusinesses.
Farms producing goods and services for the surrounding community	p. 175-176	A new social model based on environmental stewardship puts emphasis on commons and collective management, particularly of land use. Agroecological practices are favored. Policies fix critical charges to protect ecosystems, local agriculture is diversified and responds to a wide range of needs. Land use rights override property rights. Move from economy of ownership and consumption to one of functionality and service management.
Agricultural cooperative emphasizing quality	p. 175	Consumers require diverse, tasty, healthy, ethical and environmentally certified nutrition. Higher prices, subscription or contract purchases limit price fluctuations. Public policies support collaborative schemes and regional food diversity, although protected regional production may risk disrupting ecosystems in some regions. Cooperatives improve bargaining power of farmers, reduce costs by pooling capital and resources, achieve economies of scale by reducing unit cost of inputs and services.
Resilient farms embedded in urban processes	p. 176-177	Farms embedded in urban networks, where urban job opportunities lead to fluctuating mobility and result in fine-tuning of farm labour. Farming guarantees minimum income and access to staple foods. High adaptability in family labour creates resilience but implies acceptance of low farm incomes and on-farm skills not stabilized. Migration generates benefits through transfer of knowledge, skills and technology. Land use stable and farm size tends to decrease.

“Livestock Systems” Hypotheses

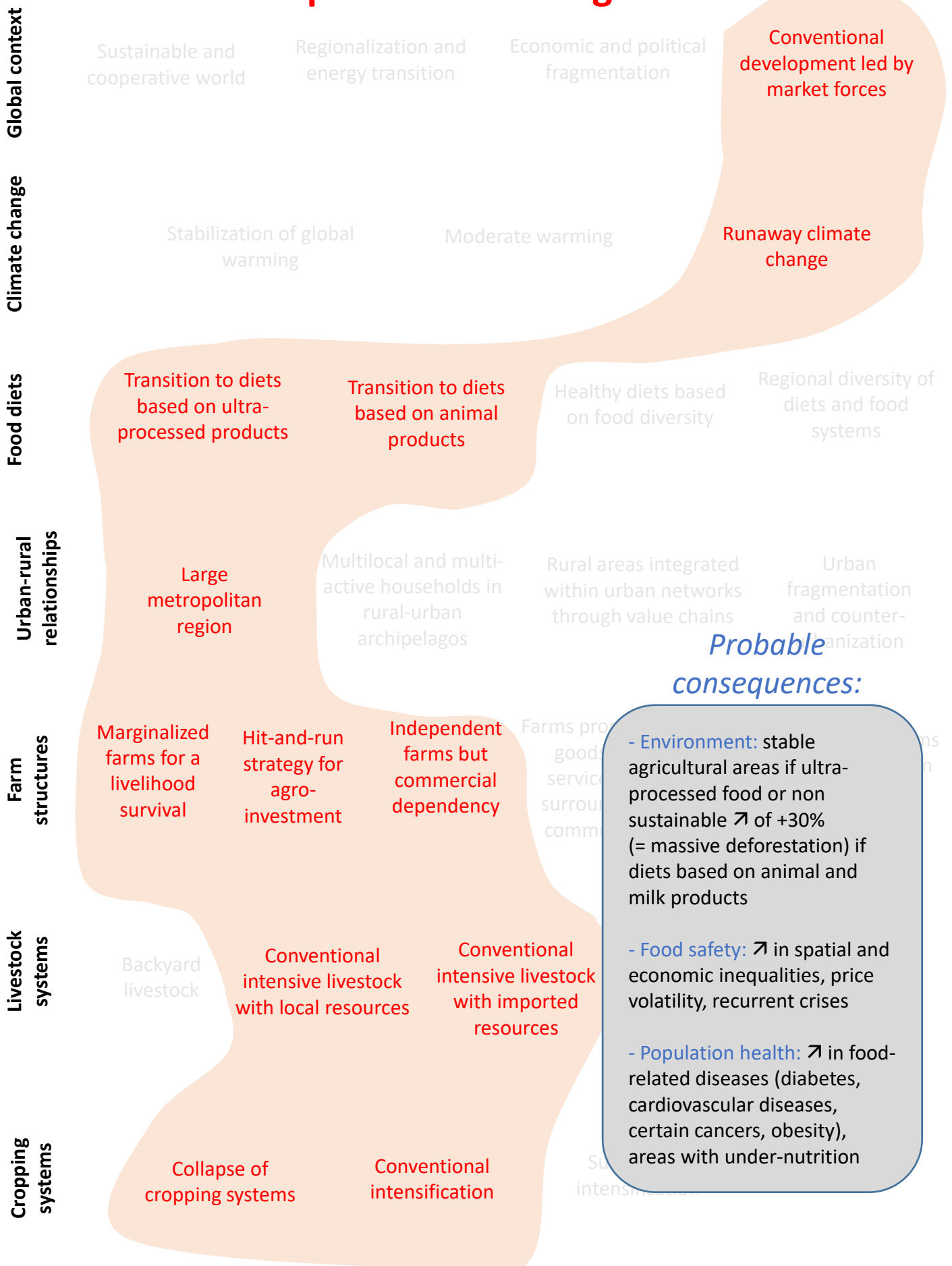
Hypothesis	Ref.	Presentation
Backyard livestock	p. 203 & 205	Shares some characteristics with agroecological farming: search for synergies between production and the environment, low dependence on industrial inputs, high labour requirements. Involves lower technical development and lower production efficiency. Amount of backyard production varies with ruralization of the population, policies to fight poverty, innovations to improve efficiency.
Conventional intensive livestock with local resources	p. 203	The factors and inputs used in livestock production are sourced within a specific geographical area that can range from the neighbourhood to a supranational union. In countries where land availability is restricted, such systems compete for land with crop production.
Conventional intensive livestock with imported resources	p. 203	Based on almost unlimited availability of key production factors (land and water, capital, inputs and labour). Involves a concentration of animals and a specialization of activities. Systems evolves through genetic improvement of livestock, development of antibiotics, use of nutritious feed. Factors and inputs come from all over the world through international trade, so production may be highly dependent on foreign land.
Agroecological livestock on land in competition with agriculture or urbanization	p. 202-203	Secures farmers’ incomes, limiting industrial inputs, strengthening autonomy, links with local resources and synergies between livestock systems, cropping systems and the environment. The principles are, e.g., management of robust breeds, reduced use of antibiotics, feed and protein autonomy, mixed livestock, combinations of livestock and crops. Requires new forms of organization. The system may develop from farmers’ desires to change methods, local or national policies, consumer demand, in reaction to health or economic crises.
Livestock minimizing competition with cropland	p. 202	Husbandry of small and large ruminants in extensive or pastoral systems. Almost exclusive grazed diet and low stocking densities. Variability in forage resources requires adapted livestock management. Extensive herd mobility to optimize access to resources. Can lead to degradation of lands but may also avoid soil degradation and restore land. Production of ruminant meat limited, poultry and pork could fill the demand gap. Climate change, water access management, environmental or health crises may lead to this system.

“Cropping systems” Hypotheses

Hypothesis	Ref.	Presentation
Productive impasse in crop production (collapse)	p. 188	Collapse corresponds to a series of potential dead-ends in agronomic terms (climatic disruption or bio technical impasses) and socio-economic terms (land insecurity, access to inputs, markets or credit, production profitability conditions, lack of labour, etc.).
Conventional intensification of agriculture.	p. 188	Intensification is based on specialization in production. This can produce high yields but is highly sensitive to climate variability and biological hazards. It is also dependent on agro-industrial inputs and fossil energy. Depending on the degree of mechanization, the labour requirement is variable. This trajectory can become more sustainable by improving input efficiency or by a complete reorganization in order to diversify production. No adaptation can lead to a productive impasse.
Sustainable intensification of agriculture.	p. 188	Seeks to combine intensification of production with reduction of cropping system’s environmental impact through maximizing efficiency of inputs used. Based on use of technologies designed by or in association with agribusiness: genetic (GMOs), biocontrol of pests and diseases, precision agriculture, information technologies. Implies dependency on agricultural suppliers. Yields are high and agro-environmental resilience improved compared to conventional intensification, but does not reach levels of agroecology.
Agroecology	p. 189	Based on diversification of crops and/or coupling of crops and livestock, requiring complete redesign of production system. Uses biological regulations produced by ecosystem itself. Great autonomy and resilience, from agroenvironmental and socio-economic point of view with low dependence on industrial inputs and fossil fuels. Requires large amounts of labour or appropriate mechanization. Yield levels depend on diverse characteristics of systems. These systems often only way to improve production because of autonomy from exogenous resources.

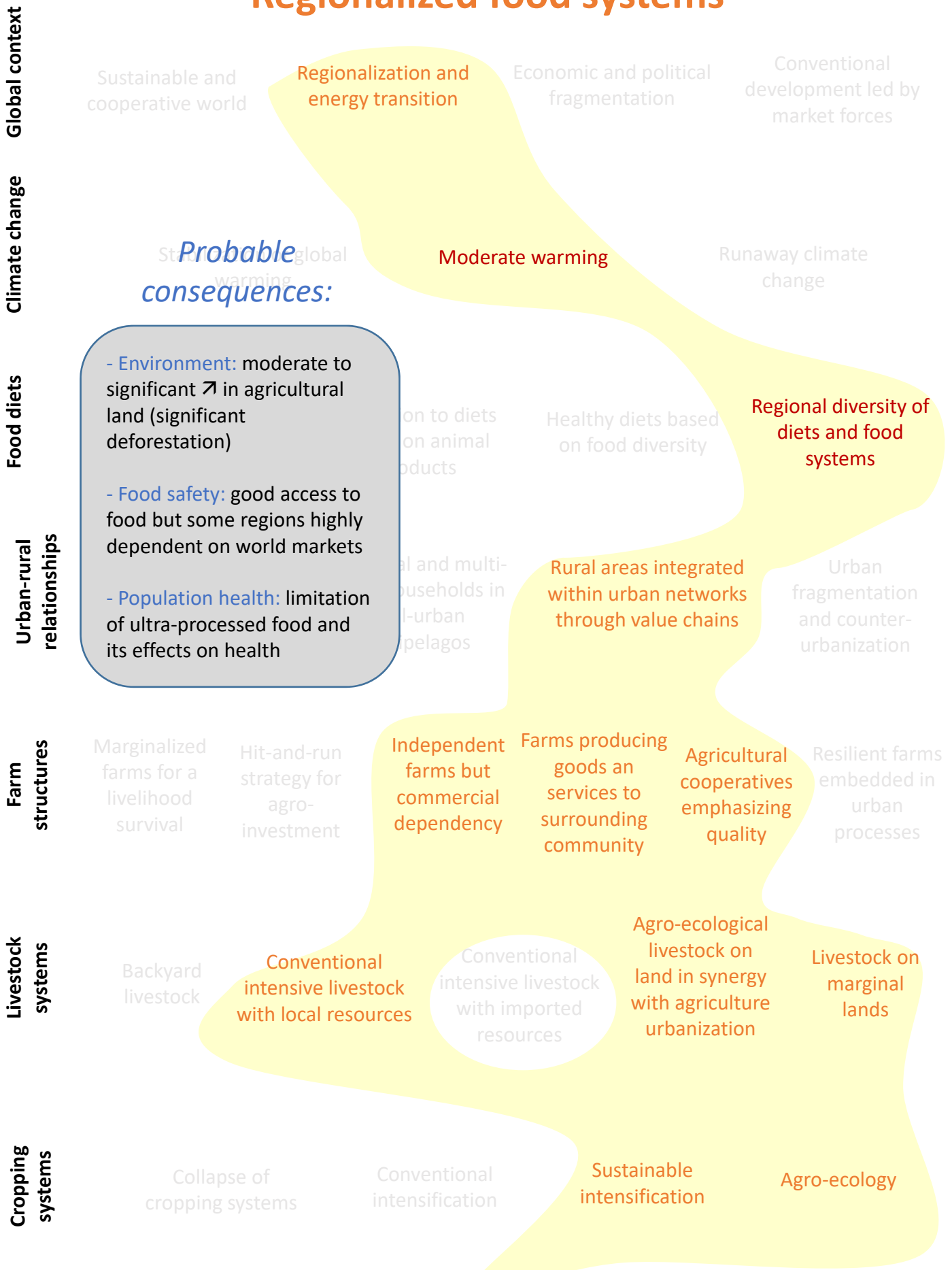
Possible #1 for 2050

Metropolization and agrobusiness



Possible #2 for 2050

Regionalized food systems

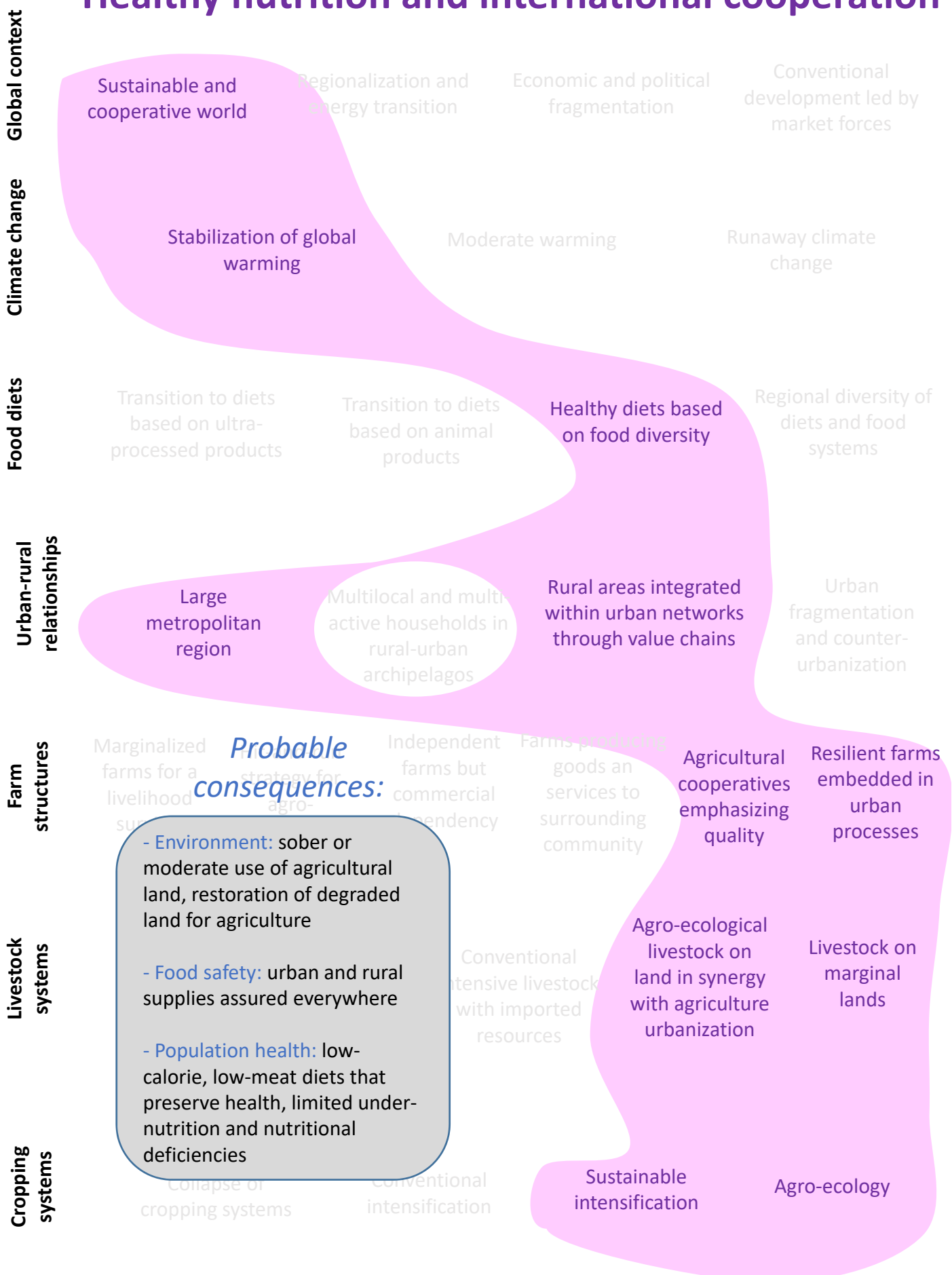


Probable consequences:

- **Environment:** moderate to significant \nearrow in agricultural land (significant deforestation)
- **Food safety:** good access to food but some regions highly dependent on world markets
- **Population health:** limitation of ultra-processed food and its effects on health

Possible #3 for 2050

Healthy nutrition and international cooperation



Possible #4 for 2050

Rural communities in a fragmented world

