Informative card 1 – **Definition of Food System**

By the term “food system” we mean:

* The focal point of interest: **supply chain** (i.e. organisations/businesses, individuals, and their networks), who engage in all economic activities around the production of beef cattle and sheep products ranging from: feed production, animal breeding and reproduction, extensive farming systems, to primary and secondary processing, distribution, and retailing [BLUE ARROWS]
* Those organisations or associations **supporting the supply chain** [ORANGE CIRCLES]
* together with **the stakeholders affected** by the way production is taking place, [GREEN EXAGONS]

Including

* their interactions
* and operational environment (e.g. policies, regulations, trade agreements, existing infrastructures)

Together with

* **Biological organisms** that are involved in biophysical/ hydrological/ geological/ chemical processes such as microbial contamination, mineral or hydrological cycles (in a direct analogy with humans’ food systems activities) where biotic and abiotic parts interact [BLACK BOX WITH PICTURES]



Informative card 3 – **Resilience Functions/Roles/Goals of Food System Agents**

*i)* ***Related to business owners’ private interests***

1. Reasonable profit margins or ROI
2. Succession
3. Reasonable workload
4. Sufficient local employment opportunities
5. Respect of the community
6. Contribution to social cohesion of community
7. Food security (access, availability, utilization)
8. Provision of other products i.e. leather, wool, wood, manure
9. Adding value and increasing customers’ satisfaction
10. Personal/family satisfaction and wellbeing

1. *(ii)* ***Related to the multiplier effect*** – recycling money to local industries such as feed, fertilisers, vets, machinery, hauliers etc.

(*iii)* ***Related to public goods/service***

1. Flood prevention
2. Moderation of other climate change effects (e.g. disease/pest spread)
3. Biodiversity enhancement
4. Carbon sequestration in upland moorlands, peatlands and forests
5. Clean water and air
6. Maintenance of genetic diversity
7. Preventing of depletion of reserves through effective recycling (e.g. minerals)
8. Access and recreation value for the public
9. Natural Landscape preservation and habitat/soil enhancement
10. Preservation of historic and cultural value of landscape
11. Counteracting negative local demographics
12. Other…..?

Informative card 4 – **Resilience Disturbances & Long-term Pressures / Shocks/ Drivers of change**

**Biophysical Drivers - Slow variables:**

1. Changed weather patterns (e.g. gradual increase of temperature)
2. Changing disease/pest spread patterns
3. Energy/water availability
4. Land/soil and habitat degradation
5. Pollution of air, water, soil

**Biophysical Drivers - Sudden/ Unpredictable**

1. Extreme weather events (e.g. drought)
2. Outbreaks of diseases

**Economic – Regulatory – Political Drivers**

1. Price volatility to inputs and products
2. Uneven power dynamics in the supply chain
3. Competition for alternative land uses: forestry, shooting sports and nature conservation, housing
4. Increasing dependence on financial institutions
5. Brexit – subsidies
6. Brexit – free access to the EU market & tariff protection/global trade arrangements
7. Brexit – production standards (e.g. conditions for transporting and slaughtering animals, restrictions in use of antibiotics/vaccines, GMOs etc.)
8. Brexit – access to foreign labour

**Social Drivers**

1. Limited basic infrastructure (i.e. broadband, roads) and access to services
2. Demographic pressures, increasing urbanisation, the issue of succession, a reducing pool of upland farming skills and knowledge
3. Unfavourable profile of agriculture/ food manufacturing/veterinary as a career
4. Societal concerns about meat production for damaging ecosystems
5. Changes in consumer lifestyle and consumption patterns
6. Terrorism / Cyber attack
7. War/conflict elsewhere in the world

Informative card 5 – **Mitigation/Adaptation Strategy (Responses)**

1. Reduce stocking rates & totally remove livestock over the winter months
2. Improve resource efficiency e.g. waste reduction, labour optimisation, asset utilisation
3. Improve operational efficiency e.g. lead time reduction, bottleneck mitigation
4. Utilize technological innovation
5. Diversify into new agricultural income sources
6. Diversify into non-farm, and off-farm activities
7. Diversify inputs, outputs, market channels, decease control measures etc.
8. Share resources e.g. labour, machinery etc.
9. Modify degree of reliance on subsidies
10. Geographical distribution of facilities, markets and assets
11. Prioritise local/short market channels;
12. Reserve production capacity, raw material stock, finished products & Backup power generation
13. Increase strategic visibility e.g. awareness of consumer trends, markets, competitors
14. Increase supply chain visibility e.g. raw material/product traceability, awareness of suppliers/customers’ limitations
15. Increase financial readiness e.g. insurance, savings, portfolio diversification
16. Use renewable energy
17. Increase physical and electronic security
18. Increase market status e.g. product differentiation, brand reputation and value, build customer loyalty
19. Other …?

Informative card 7 – **Characteristics Indicating Vulnerability**

1. Heavy resilience on external or distant resources
2. Low diversity in assets or entitlements
3. Inequality in either access to resources and/or ability to take action to use on increase them
4. Institutional weaknesses and low institutional capacity
5. Inflexible policy
6. Lack of functioning markets and low levels of economic activity
7. Highly specialised production, supply, marketing chains
8. Ignoring slow variables and only responding to fast triggers
9. Cross-scale interactions, including subsidies, that are poorly understood and lead to uncertainty and surprise
10. Insufficient recovery from previous shocks that have reduced the adaptive capacity
11. Other …?

Informative card 8 – **Barriers or Facilitators for food system resilience**

**(Sufficiently existing or Lacking)**

* **Interactions:** Formal or informal ***grassroots networks*** such as co-ops, farmer’s markets, food manufactures’ associations, linkages with advisory or extension services/labs; ***Formal distant networks*** : National & local Government; WTO; EU commission; NGOs
* **Institutions:** ***informal*** (soft) including norms, ethics, and customs, or ***Formal*** (hard) including policies, regulations, protocols, contracts, standards, property rights and land tenure laws

network governance mechanisms which refers to ***operational systems and procedures relating to power distribution, accountability and conflict management, knowledge diffusion and reflective planning etc.***

* **Infrastructure:**  Physical (roads, railways, internet & communication networks), Financial (banks, access to other financial products), Knowledge/research (labs, universities/research Centre facilities)
* **Capabilities of food system actors/agents:**
* Production/processing/retailing/distributing
* ***Marketing*** (searching for potential markets), ***Entrepreneurial***: networking (searching for potential collaborators) and innovation (searching for innovative solutions)
* ***Operational management skills***
* ***Collective-Management/ leadership skills*** (e.g. conflict resolution/negation skills, ability to create connectedness/ reciprocal ties/mutualism)
* **Market structures** (e.g. oligopolies, monopolies, direct market channels, bargain power in the supply chain etc.)

Informative card 2 **- Definition of Resilience**

Resilience is **the capacity** of a business, or a system as a whole to:

1. either *absorb/* ***buffer*** against internal and external disturbances, or
2. *learn and* ***adapt*** through**incremental changes**in order to be less exposed**,** and
3. even ***transform*** through **radical changes,**so shocks and long-term trends/ stresses are no longer affect them.

Informative Card 6 -**Triplet Choice of mitigation/adaptation strategies (responses) based on trade-offs to meet resilience goals**