

Bioregional Weaving Lab

Deliverable 4.4: Synthesis and recommendations

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Introduction to this report

This report is the final deliverable in Work Package 4 (WP4) of the Dairy Flagship, led by the Waterford Bioregional Weaving Lab (BWL).

It aims to **synthesise** all of the knowledge and outcomes produced as a result of our work throughout this 'Activation Phase', which began in September 2023, and finishes in February 2024.

The intention for this report is to act as **input** for the formulation of the 'Implementation Phase' of the Dairy Flagship. Please see particularly **Part 5** of this report (recommendations).

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WP4 activities and outputs

1. **On-site farm visits** throughout bioregion
2. **Baselining Report (Deliverable 4.1)** - a report describing our suggested approach to baselining across the 4Rs at farm-level and beyond
3. **Workshop #1 Report** - Workshop on ecosystems, opportunities and constraints
4. **Intervention Areas Report** - deep dive research into three of the four thematic areas emerging as key for intervention, based on workshop outcomes
5. **Concept Note on the Implementation Phase** - report on the need for landscape/bioregional approach, and input on WP1 implementation phase document.
6. **Workshop #2 Report (Deliverable 4.2)**
 - a. Outcomes of workshop on co-created vision for dairy in the bioregion
 - b. Input on shared vision for dairy production in the Waterford bioregion
 - c. Feedback on appetite for testing collective and specific innovations, key systems changes that are needed and mindset-shifts required
7. **Typologies report (Deliverable 4.3)** - Farming, landscape and community typologies report
8. **Workshop #3: systems analysis** (two-part workshop online). Appendix to Final Synthesis Report
9. **Final Synthesis and Recommendations Report** - culmination of WP4 findings and interventions needed going forward



An overview of the stakeholders included throughout WP4

Dairy Farmers	
Dairy Livestock Farm	Visit 1 - Sep 19
Dairy Livestock Farm	Visit 1 - Sep 19
Dairy Livestock Farm	Visit 1 - Sep 19
Dairy Livestock Farm	Visits - Sep 20/Nov 13 + ongoing calls
Dairy Livestock Farm	Visit 1 - Sep 20
Dairy Livestock Farm	Call 1 - Oct 04
Dairy Livestock Farm + Apples	Visit 1 - Oct 15
Dairy Livestock Farm	Call 1 - Oct 23
Dairy Livestock Farm	Workshop(s)
Dairy Livestock + Arable Farm	Visit 1 - Nov 13
Dairy + Beef Livestock Farm	Visit 1 - Nov 15
Dairy Livestock Farm	Call 1 - Dec 01
Dairy Livestock Farm	Workshop(s)
Dairy Livestock Farm	Workshop(s)
Dairy Livestock Farm	Call 1 - Jan 08
Dairy Livestock Farm	Workshop(s)

Non-dairy farmers

Dry Stock Farm (ex-dairy)	Visit 1 - Nov 15
Mixed farm	Visit 1 - Nov 15
Contract silage and heifer rearing (ex-dairy)	Visit 1 - Nov 13
Ex-dairy	Workshop(s)
Retired organic farmers	Workshop(s)
Other stakeholders	
Integrated wetlands expert	Visit 1 - Sep 20
Agricultural Management expert	Calls - Oct/Nov
Dairy farm co-ordinator for Camphill Communities charity	Workshop(s)
LAWpro representative	Workshop(s)
Bó Mhór: project exploring milk waste	Call 1 - Dec 14
UCC MaREI post-doctoral researcher	Call 1 - Dec 14
Waterford T.D. and Green Party Spokesperson for Social Protection	Meeting 1 - Dec 18
Ecologic.eu coordinator agriculture and soils, senior fellow	Call 1 - Jan 12
Academic Researcher on innovation capacity in Irish farming households	Call 1 - Jan 16
Bioeconomy Foundation representatives	Call 1 - Jan 16
Post doctoral researcher at Teagasc (and ENFASYS)	Call 1 - Jan 22

Stakeholder inclusion details:

An overview of the engagement and collaboration with relevant stakeholders throughout WP4.

Interaction type	Quantity reached
Farmer / stakeholder in-person visits (one to one)	13
Farmer / stakeholder video calls (one to one)	14
Workshop #1 (co-sensing)	8
Workshop #2 (co-visioning)	13
Workshops #3 and #4 (systems analysis)	5
Online feedback sessions	4

Stakeholder type	Quantity reached
Dairy Farmers	16
Non-dairy farmers	5
Non-farming stakeholders	11

The landscape approach of BWL within WP4

WP4 consisted of in-person and online visits and conversations with key stakeholders in the dairy system in the Waterford bioregion. In addition, we held two in-person and one online workshops, and attended Flagship events on and offline.

The WP stakeholders include both **farmers and non-farmers embedded in the region**, and others with closely related knowledge. Many are dairy farmers working with approaches that work 'with nature', for example organic, regenerative, no-chemicals or other approaches that are not the dominant and conventional 'extractive' farming practices seen in most of the dairy sector today. There are also stakeholders who are more conventional, intensive dairy farmers, non-dairy farmers, and representatives of organisations in the ecosystems around dairy farming.

Experiential and empirical evidence from the broader European BWL network and its backbone organisations (Commonland and Ashoka), as well as the experience and ecosystem build up in Ireland since 2022, provides the basis for the underlying **knowledge and assumptions** guiding our landscape/bioregional approach:

- We cannot remove dairy farming from the overall food system and socio-cultural **context**. A bioregion scale is suitable for addressing this due to human and natural factors.
- Targeting symptoms of the problem (e.g., GHG emissions) will not solve our challenge, we need a **systemic** approach that addresses the root causes and mindsets.
- Changes must be made **by all** actors, from citizens, to farmers, to institutional actors.
- A hard and fast definition of what is or isn't sustainable dairy does not exist. We need **experimentation** and 'trying by doing'.
- Sustainable is not enough: we need to move the dairy system towards a way of producing and consuming dairy nutrition, that is not only sustainable, but **restorative** and **regenerative** concerning the natural ecosystems and socio-cultural context. It must also be (economically and biophysically) **equitable** for the living and not-yet-living.

Part 3: The Four Losses

The following section synthesises the knowledge of WP4 (particularly the 3 workshops) in combination with the learnings of other existing and ongoing projects and initiatives, to describe the 'losses' across the four areas we consider essential to address for holistic landscape approach (economic, inspirational, social, and environmental) and which underlie the framework of the Dairy Flagship (see Figure 1).

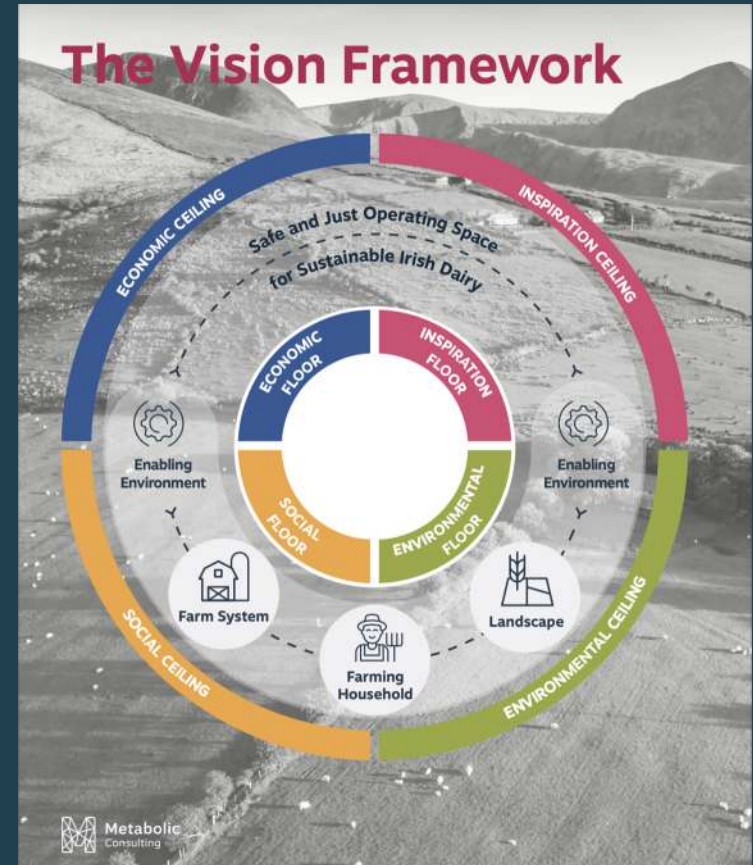


Figure 1. Four Returns Framework of the Dairy Flagship

This approach involves first describing losses across the four areas, to arrive at a type of 'baseline' or assessment of the state of the dairy system in environmental, social, inspirational, and financial terms. This allows us to then put forward solutions or steps towards bringing about returns that will directly or indirectly address these losses.

This approach is based on the theoretical work of Commonland, and is exemplified in figure 2 in the context of ecosystem degradation. We attempt to apply a similar approach to the bioregional dairy system in Ireland.

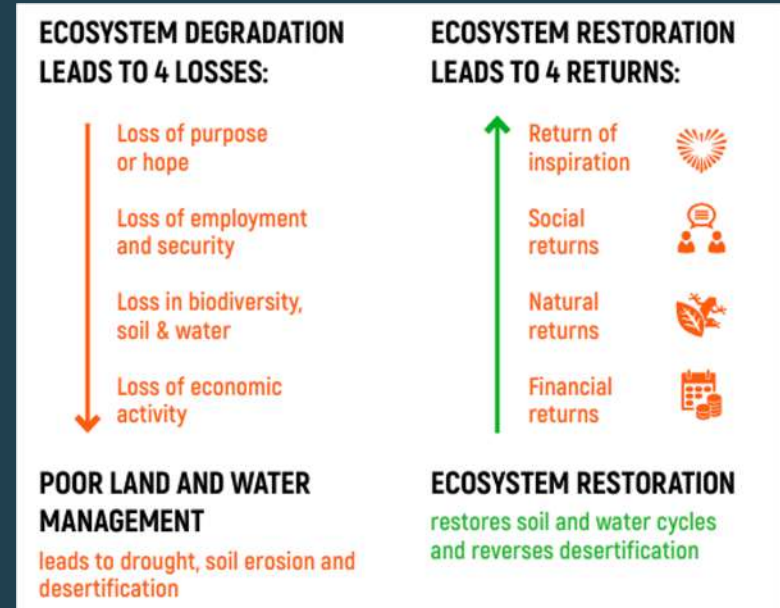


Figure 2. The four losses, and four returns of ecosystem degradation and restoration (source: Commonland)

Gaps identified: 4 losses

Synthesis of 3 workshops and engagement throughout WP4

1. Inspirational Losses

- a. Sense of **disconnection** between dairy farmers and other stakeholders (e.g. end-consumers), as well as between people and the natural landscape
- b. Lack of faith and **hope** in the future of dairy farming. Lack of **pride** in dairy farming's contribution to society (e.g., sense of dairy farmers as **stewards** / caretakers of farmland)
- c. Sense of a lack of control or "the **freedom to farm**" preventing changemaking (e.g. due to regulations, input dependency, and economic risks)
 - Lack of creativity / diversity / farmer's connection to **end-products** from dairy farming - local, bioregionally, nationally and for export
 - Entrenched views / **mindsets** (e.g., what is a 'good' farmer, and what is 'quality' food) preventing innovativeness, creativity, and change: need for more experimentation at all levels from dairy farm to governance
- a. Lack of safe **spaces** for open discussions in farming groups that are place-based, open-minded, include multi-stakeholders and are constructive for 'farming with nature'.
- b. Lack of **trust**, disillusionment, confusion/frustration relating to the political and governance system (e.g., administrative burden of schemes)
- c. Lack of **inclusion** in decision-making: Sense that dairy farming representative groups do not account for own voice. Feeling that dairy farmers' (especially from smaller farms) agency to influence change in policy and systems change is lacking, sense that policy is being "landed on us".
- d. Lack of **co-ownership** that could give joint **sense of purpose**, motivation and drive. Dairy farmers feel a lack of access to groups that they feel can make positive change for nature and communities through more sustainable/regen approaches.
- e. Lack of understanding that biodiversity, soil health, human health, water quality are not side benefits to our current challenges - they are core to and should drive any future strategy and solutions.

Gaps identified: 4 losses

2. Social Losses

- a. Disillusionment in the reality of being a dairy farmer in current political and social context leading to exiting the sector. Loss of meaningful **jobs**: losses to viable, purposeful jobs in rural areas, thus also negatively affecting the local communities / rural economy
- b. Loss to both **farmer and animal health** and wellbeing. Challenges with **work-life balance** and sourcing labour, leading to lack of flexibility. Depression and other factors of well-being not being taken seriously. Animal welfare also important in affecting human welfare and mental health.
- c. Lack of **transdisciplinarity** and holistic-ness in education, research, policy-making and farm advisory
 - Lack of **education** on food **systems** and nutrition for all groups in society (from citizens, to policy makers, corporates and farmers)
 - Lack of enough farm-to-farm knowledge exchange - facilitated by a transition team who knows the individuals, via **local hub** or support structure, creating community, collaboration and innovation
- a. Sense of un-fairness in the system: political and social **tension** among different stakeholder groups, sense of lack of respect for (certain) dairy farmers. Echo-chambers / group think are prevalent - need for groups facilitated for inclusion of all diverse stakeholders.
- b. Lack of investment in enough **intergenerational** on- and off-farm interaction, and addressing the fundamental importance of **succession** issues: ageing demographics and lack of youth, leading to consolidation of small farms to more intensive, larger dairy farms, decimating rural communities (and GAA clubs).
- c. Few opportunities to try new **farm ownership and governance structures** - for example community-owned farms that employ farmers on fixed salaries, or trials of universal basic income for farmers.

Gaps identified: 4 losses

3. Environmental Losses:

- a. Landscape and ecosystem **degradation** including to biodiversity, water, soil, animal and human health
 - The need to restore, regenerate, appreciate, protect and **value** 'nature' more: Lack of **reward** for space for nature / biodiversity in dairy farms Lack of centrality of **soil health** within all farming and policy decisions
 - Over-reliance on **chemical** inputs in the dairy system is still dominant - lack of communication on viability of alternative approaches.
 - **Additionality**: results-based reward discussions will not reward those farmers who have already made positive changes in the past. Outcomes based.
 - Lack of financial and advisory support to **experiment and trial** farming methods like agroecology, integrated wetlands etc.
- a. Lack of **circularity** and localisation in dairy system input and output flows e.g., use of local grain on dairy farms, farm-matching schemes within the bioregion, and on farm diversification
- b. Perceived '**green washing**' by certain actors: need for effective compliance certification systems and coherence of environ and non-environ agri schemes.

3. Financial Losses

- a. Lack of economic **equality**: In terms of income and access (e.g. land ownership) especially between small and large farms.
- b. Economic **risks and rewards**:
 - Lack of economic **security** / support structures for conversion to less intensive farming practices - challenges to diversification
 - Lack of market **rewards** for environmental awareness - challenges to reinvesting in sustainability
 - **Uncertainty** in future outlook for dairy makes investment and decision-making difficult. One farmer described a lack of *"direction of travel from government-level"* saying that *"We need a vision of what is expected of a dairy farm in 5 or 10 years, but no one can give us direction on that"*
 - Emphasis on trying to establish market-price certainty should be matched by building **infrastructure for resilience** in changing world.
- a. Input and output price **volatility**, and rising cost of land can leave farmers in debt
- b. Economic pressure to maximise production and **efficiency**, making extensive farming less viable
- c. **Administrative burden** of support schemes / regulation: e.g., need for streamlining of sustainability reporting requirements from govt (e.g., BISS, other CAP schemes) and cooperatives (voluntary sustainability schemes) and food safety (BordBia).
- d. Lack of new financial thinking around investment in wider portfolios beyond individual farms - no **new financial instruments** being tested (e.g. new bioregional banks, landscape funds, holistic outcome payments or universal income schemes).

Part 4: The 4 Returns

The following section synthesises the knowledge of WP4 in combination with the learnings of other existing and ongoing projects and initiatives, to describe the recommendations that may address the afore-described four losses, returning dairy farming to a safe and just operating space (SJOS).

We present both short- to medium-term (part A) and long-term (part B) Recommendations, categorised based on the **three main 'impact pathways'** identified from workshops #1 and #2:

1. Education and communication ecosystem
2. Routes to market
3. Holistic, diversified and bioregional approaches

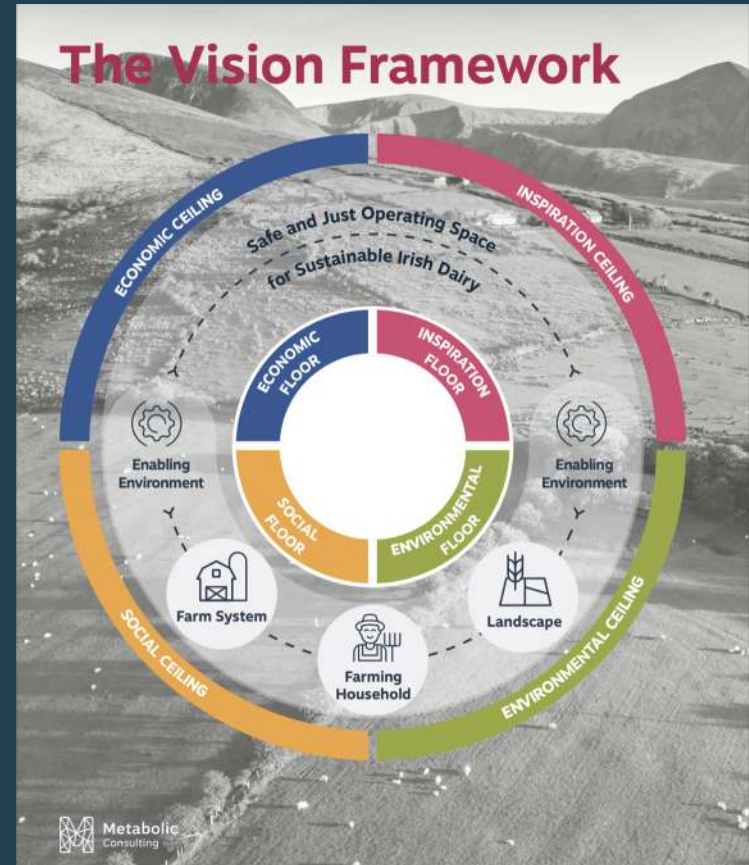


Figure 1. Four Returns Framework of the Dairy Flagship

Summary of the 4 Returns (Workshop #2)

See Appendix for system analysis (Workshop #3)

Inspiration is returned through:

- Intergenerational community interaction around dairy farming
- The security, ability and energy to create, experiment and inspire
- Pride in the quality nourishment of dairy that is produced locally to people
- Farmers have fair influence on government policy and are respected as stewards of the land

Social Capital is returned through:

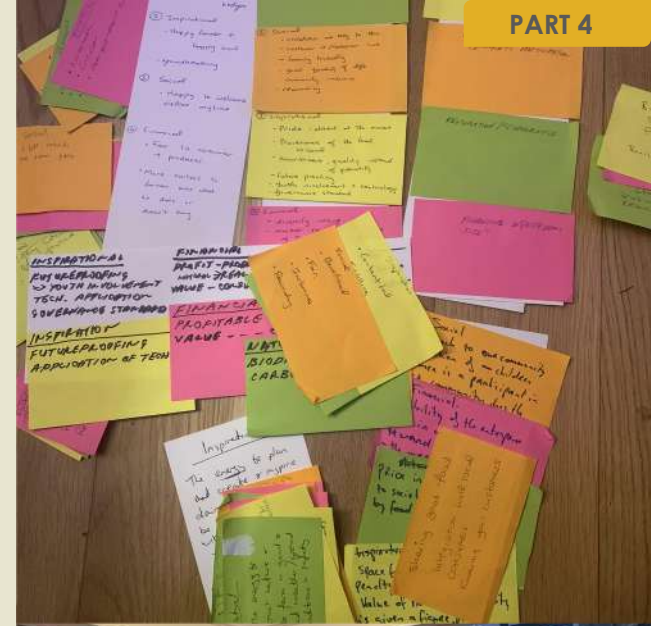
- Contribution and interaction with the local intergenerational community / consumers through social and educational processes
- A balanced lifestyle for dairy farmers that ensures the time and energy for socialising

Natural Capital is returned through:

- Protection and regeneration of biodiversity / landscapes in and around the dairy farm, which is rewarded by markets and society
- Dairy products that are nourishing for consumers and come from healthy livestock

Financial Capital is returned through:

- A fair, dignified, living wage which enables / rewards the farmer to experiment and invest in farming practices which are beneficial for human and ecosystem health.
- Independence, resilience, and diversity in income for dairy farmers



A) Short to medium term recommendations for 4 Returns

1. Education and Communication Ecosystem

- a. **Food system education:** greater awareness of the link between food, farming and health is needed at all levels from public campaigns, mainstream media and school programmes (e.g., Farmer Time). Along with greater support for people who lack capacity/knowledge for cooking. **Social + Environ R**
- b. **Education projects** – ‘regenerative’ education modules by local training facilities (e.g. bioregional collaboration with Dunhill Multi-Education Centre) with specific modules for dairy farmers and their families, co-developed by farmers and other stakeholders (e.g., soil health, systems-thinking). Include open farm visits for the broad public to understand how dairy is made. **Inspiration, Social + Environ R**
 - Example: education initiatives for younger generations ([NextGen-ReGen 2024](#), and [Emergent Generation](#))
- a. **Farmer-led experimentation groups:** Facilitate the ownership + experimentation of farmer- and stakeholder-led innovations (e.g., the Farm Sustainability Index developed by the BRIDE project team as part of the BWL). Need for place-based, trust-based approaches for delivering tools like the FSI. International examples of farmer-led experimentation initiatives include: the [RENETA](#) farm incubator network. **4 R**
 - **Collective action groups:** farmer discussion groups are reported to often lead to ‘group-think’ and ‘echo-chambers’. Collective action groups, moving beyond discussion alone, could include other-stakeholders, being based on equitable and inclusive principles, to keep creativity flowing.
- a. **Personal farm-advisory:** increase resources for farm-advisors to give adequate, tailored, holistic attention and advice to individual farmers. Case study: DAFM Knowledge Transfer Scheme is promising, yet there is a reported need for more resources for identifying local needs with local farmers **4 R**
- b. **Terminology and understanding:** important that all actors explicitly describe their intended meanings behind the use of common terms like ‘sustainable’, ‘regenerative’, ‘new normal’ etc. to prevent misunderstanding/‘greenwashing’ and to more clarity around extractive processes. **Social + Environ R**

2. Routes to market

- a. **Public procurement:** creating a reliable, predictable market for 4R dairy. Opportunity for spending public money in a way that supports actors who are making shifts in line with the transition needed to restore returns across all dimensions of 4R and influences consumer behaviour. Danish Organic Action Plans show the way. Government and local authorities in bioregion can pioneer. **Financial + Environ R**
- b. **Local/organic markets:** organic dairy can help to deliver Environ Returns. Government schemes could help to support organic and local dairy markets to deliver on the 4R. Example strategies could include: requirements on dairy cooperatives to invest in organic processing, requirements on retailers to have “buy local dairy” sections, and Protected Designations of Origin (PDOs) to secure certain catchments of 4R dairy producers. **Financial + Environ R**

3. Holistic, diversified and bioregional approaches to the dairy system

- a. **Diversification:** support short to medium-term diversification of dairy farms towards more holistic, bioregionally integrated roles (e.g. on-farm education, silvopasture, biodiversity stewards etc.). Includes training all farm advisors in alternative systems e.g., agroforestry. Social farming and other forms of diversified activities must be within the SAJO (eco-tourism, education, weekend activities) 4 R
- b. **BWL hub** – support the infrastructure of BWL or equivalent trusted **transition teams** with a suitable space for attracting dairy farmers and related stakeholders. Weavers and support roles within the hub or team can deliver tailored services and support local initiators and initiatives 4 R
- c. **Bioregional visioning:** undertake co-visioning at a scale that people can relate to. Allow for the bioregional level of co-creation to inspire the national level (showcasing from the ground-up how to transition the dairy system). This would deliver the recommendation with NESF (2023) which calls for “clearly, consistently and coherently communicating a whole-of-society vision”. **Inspirational R**
- c. **Holistic data collection for baselining and tracking:** sustainability ‘indexes’ for dairy farms, retailers, processors, and government (i.e., all levels and actors). Allows us to baseline and track changes over time. Results-based rewards included (wherein farmers who have made sustainable transitions already, are awarded for that retroactively). 4 R
 - **Bioregional mapping:** data on soil, geology etc. at a bioregional and relatable scale to guide the dairy system transition. Good recording of acreage coming into the SJOS will inspire as positive change is documented (BWL and GSI example)
- c. **Succession planning:** a programme for facilitating farm succession to younger generations, to preserve extensive dairy and family farming (requires a bioregional, relationship-based approach). (BWL-related workshops underway) **Social R**
- d. **Land-use transition programme:** assist interested dairy farmers (e.g. those close to retirement), in finding innovative and viable (4R aligned) land-use options. Includes providing access to knowledge and inspiration (via networks/hubs). 4 R
 - Examples: Macra Retirement fund, and farm partnerships, share farming, circular farming, allotments.
 - Potential need for one central matching platform for all current land owners and aspiring land users / co-owners, with a particular focus on agri-environmental uses.

B) Long term / systemic recommendations for Four Returns

1. Education and Communication Ecosystem

- a. **Experimentation:** “Integrating foresight and anticipation together with a learn-by-doing, experimental approach” (NESC, 2023), combined with a culture/mindset shift to addressing systems as a whole, not trying to solve just the symptoms of the dairy system. 4 R.
 - Amplify and legitimise the knowledge created within pioneering and experimental projects and organisations (e.g., BASE Ireland, Burren Beo, DANU, Bride, and other EIPs). Support the people involved in these projects to advise policy-makers.
 - Exploration grants (public money for ‘trying by doing’ approaches to dairy farming) without bureaucratic burdens.
 - Case study: ACRES Cooperation Scheme is promising, yet should be applied to all applicants and ACRES teams should be transdisciplinary
- b. **Transdisciplinary research and solutions:** farmers are legitimised as valid researchers / knowledge-holders, and can work in collaboration with scientists and other stakeholders for testing new farming practices / localised solutions. Risks and rewards are shared equitably (i.e. public research is not only risk taker, it also benefits from rewards from private corporations benefiting from research). 4 R
 - Stakeholders in the dairy system should undergo more agri-environmental, holistic, cross-disciplinary, compulsory, ambitious training
 - Case studies: Agricultural Sustainability Support and Advisory Programme (ASSAP), formed in 2017. Other case studies where transdisciplinarity and 4R/landscape/regen could be increased and integrated as core-content: Agri-aware, the Education Forum of Teagasc, the Green Cert.
- b. **Food system awareness:** complete shift in the way food is understood by citizens, and institutions alike, toward a more holistic understanding of food (e.g., how it shapes communities and their environment). Long-term investment by gov and private. This plays a role in improving overall resilience and security of the food system. 4 R

B) Long term / systemic recommendations for Four Returns

2. Routes to market

- a. **Redistributive economics:** redistributive flows in the dairy sector, that mean everyone shares the risk + the rewards. Social and local relationships (and local governance) are vital to economic flows (e.g., infrastructure for more direct sales from farm to local customer). Vast majority of dairy is currently exported (94%) we need a shift in this food system model so that it no longer facilitates the maximum exploitation of natural resources (i.e., food as no longer a merely profit-driven sector). **Financial + Social R**
 - Bioregional banks and funds: financial structures at a local-scale for entangled and holistic concepts for sustainable dairy
 - Farm-gate: relax restrictions on selling at farm-gate, and support infrastructure (e.g., micro-dairies/cheese-making facilities/vending machines)
 - Support farms in establishing and joining worker-owned cooperatives/producer groups or collaborating / diversifying or adding value through marks/standards.
 - Increase the ambition of the Green Public Procurement Policy (e.g., more than 10% organic food, and more seasonal requirements, look to Denmark)
- b. **Organics:** Ireland has the target of 1 in 10 farmers farming organic by 2025, in line with the EU Farm- to-Fork ambitions, but uptake in organic dairy is lagging. There is a need for more domestic organic feed suppliers, bioregional organic groups from complementary sectors in the ecosystem, dedicated independent organic dairy advisors, research into the economics of Irish organic dairy, more added-value organic dairy processors, fair access to bank loans (despite destocking). **Financial + Environ R**

3. Holistic, bioregional approaches to the dairy system

- a. **Diversification of dairy farming:** support more holistic, integrated roles/income streams for dairy farmers (e.g., as educators/facilitators), as farmers are understood to be part of a collective action for holistic transformation. 4 R
 - Dairy farms as a place of learning and experience, not only food production - but all activities within 4Rs and SJOS.
 - Investment to support engaging with local community and/or landscape (e.g., through heritage/eco-tourism/social farming)
 - Emerging credit trading markets (e.g., carbon, biodiversity) should be managed by farm-based organisations for the benefit of farmer-based organisations and their communities - ideally on bioregional scale
- a. **Institutional weaving:** more roles (with associated capacity building) within institutions and organisations which are primarily focused on interweaving with other sectors and entities in the dairy system, to facilitate transitions at systems-level. 4 R
- b. **Streamlining:** more ambitious, compulsory sustainability schemes for dairy wherein reporting requirements are streamlined into one report for farmers (e.g., including BISS, other CAP schemes, BordBia food safety, and cooperative schemes).
- c. **Institutional culture-change:** inner-reflection and accountability-taking at the institutional level, including government, an inspirational process that may build trust + respect. Fair + inclusive participatory processes across sectors from finance to knowledge-sharing, ensuring holistic, **long-term (20+ years)** thinking behind all decisions. E.g., Teagasc dairy sector roadmaps, and bioregional food system planning 4 R
- d. **Bioregional weaving:** govt. supported infrastructure for local hubs as gathering points for community-building, creativity, and experimentation. “**regionally focused transition teams and resourcing**”, “ at a scale and extent comparable with the LEADER programme” (NESC, 2023). Teams are inter-woven by an overarching network/alliance, facilitating both knowledge-exchange and knowledge creation (both locally and internationally), wherein education is co-created by transdisciplinary actors and all actors (including government) learn along with everyone else. 4 R
 - **Rebuilding trust and relationships:** many farmers do not feel represented by farmer associations/groups. Relationships have been strained between farmers and institutions. WP4 revealed that trust remains strong within decentralised hubs / localised initiatives.
 - For example: Local Authority Planning and activity could be integrated with farmers, newly created community climate and biodiversity officers, though a bioregional planning approach (see ‘Food Secure Canada’ as an international case study).
 - Weavers can help to counteract fragmentation and ‘echo chambers’ of the dairy sector, as ‘honest brokers’, and increase citizen-farmer connection (proven to be an essential role if innovation is to succeed at scale).

Appendix - PART 5

Systems analysis outcomes from Workshop #3

The following sections display the outcomes of the collaborative Systems Analysis worksessions held online on January 22nd and January 23rd 2024 with farmers and non-farmer stakeholders, led by global expert in the field of systems analysis, Olga Shirobokova (Ashoka).



Co-developed problem tree

Symptoms →

Deterioration of soil, water, biodiversity, rural communities

High GHG emissions

Production and consumption of food low in nutritious value detrimental for population's health

Low wellbeing of farmers and thus individual farming endangered as a profession

Problem →

Majority of dairy farmers in Ireland have to employ unsustainable agricultural practices - high production intensity, high stocking rates, energy intensive diets, high use of fertilizers – to be able to produce more and submit their produce to intensive processing.

Slow transition from conventional to “farming with nature” practices.

Chain of mental models underlying the problem

Consumers

Tend to evaluate and choose food by its **price and taste**, not by its quality, nutritious value, potential for health, disease prevention and environmental consequences, buy food mainly **via middlemen** – retailers, have little understanding about how dairy is produced.

Processors

Pursue **high volumes of production** and high returns, push farmers to produce more and **dictate prices**, disregarding the loss of nutritious value for consumers, implications for wellbeing of farmers as profession and of animals, as well as **externalities on environment**

Government officials

In the **absence of demonstrated public will** for prioritizing nutritious value of food, health of consumers, wellbeing of farmers and environment, food security of the country, **do not provide sufficient support for transition** from conventional farming to farming for nature and new rules for processors and retailers.

Retailers

Serve consumers' needs by offering a wide variety of **cheap processed food**, minimize engagement with farmers and **unprocessed food** due to complications with its maintenance.

Farmers

Perceive intensive high-volume production and submission to **processors' conditions** and price as the only way to stay afloat, especially in the **absence of direct sales channels** to consumers.

Root causes →

Targeted mental models and behaviours of stakeholders

Within the worksessions we also discussed the mental models and behaviours of stakeholders within a future 4R sustainable dairy system

Consumers

Recognize the value of food as a driver for health and preventative medicine, see the connection between food production practices and wellbeing of nature and community, are willing to pay a bit more for these benefits, are more connected with farmers. Exercise pressure on government as citizens and on retailers as consumers.

Retailers

Feel pressure from consumers and government to provide healthier, locally and sustainably produced food. Allow for more local choices in the shops, make it easier for local supplier to be an option for consumers. Allow a guaranteed percentage for extra effort to the farmer, not the processor/retailer.

Processors

Recognize the danger of small farmers disappearing due existing power dynamics, also feel pressure from consumers and government. Recognize that the future of their business is about stakeholders not shareholders. Take measures to support farmers, pay them more and thus give them more breathing space to farm sustainably and provide environmental services. Diversify their production, lead the export policy in line with ethical standards.

Farmers

Produce according to "farming with nature" principles, have competent advisors / trainers at their side. Feel confident that their produce will be taken up, even if they produce less intensively and it costs a bit more. Take pride in sustainable production and their contribution to nature and communities. Explore ways of direct sales to consumers. Open their gates and invite consumers to learn about food production on the farms.

Government officials

Officially recognize the connection between food production and national health, rural economic development/farming as a profession, wellbeing of environment, as well as national security. Fund and showcase research to showcase this connection. Provide support to farmers to acquire necessary skills for farming with nature. Provide support for sustainable farmers to overcome dependence on processors and retailers and explore alternative sales channels – e.g. by uptaking their produce via public procurement (hospitals, meals on wheels, schools) and providing exploration grants for direct connection with consumers. Incentivize learning opportunities about food production for public directly at the farms. Have farm inspection also focus on farmer's wellbeing (?). Incentivize producers and processors to be accountable not only to shareholders, but to the public for externalities – e.g. via processor sustainability index.

Core emergent messages from the systems analysis

- Core importance of **education** and **research**
 - ◆ Across multiple levels from farming education, to farm advisory, and agricultural research
 - ◆ These need to be more transdisciplinary and holistic
 - ◆ Farmers feel 'locked-out' of the research system: not involved in the dynamics between processors/retailers and researchers and their subsequent influence in policy. Farming representative groups are often said to account for farmer's inputs, but many do not feel their voice is heard within these groups. Farmer discussion groups do not suffice: many report being shamed / 'laughed at' for speaking outside of the status quo. This stifles creativity.
 - ◆ All actors need constant education, including consumers, organisational staff, and government officials, towards a more common understanding of food, farming and production systems. This removes blame being placed solely on dairy farmers.
- Education is part of the way we think: and therefore of **mental models** which perpetuate unsustainable dairy
 - ◆ All actors need to be critical in their assumptions of: What is a GOOD farmer? And what is QUALITY food?
 - ◆ Cheap and fast food model - interlocking issues of lack of awareness around food nutrition and farming link, lack of restriction on food-processors (ultra-processed 'food-like substances'), affects what is then demanded from farmers (milk powder etc.). Combined with time-pressure and the need for convenience in preparing food.
- Effective education requires a culture of **experimentation**
 - ◆ Experimentation must be fostered at all levels and by all actors. An institutional culture of sharing risks, failures, and rewards, will facilitate the creativity needed to bring about a more sustainable dairy farming system.

Recommendations based on the systems analysis worksessions

1. **Support peer learning and self-organization among the early adopters** of “farming with nature” among the Irish farmers, so that they can eventually expand their circle.
2. **Support** early adopters of “farming with nature” **in research** on suitable methods and equipment.
3. **Broadly showcase diverse examples of successful transition** from conventional farming to “farming with nature” (for example, in combination with the Sustainable Farming Index).
4. **Create quality educational infrastructure** for large numbers of existing and future farmers to adopt “farming for nature” principles – e.g. learning materials and programs, competent advisors.
5. **Support** “farmers with nature” in **developing alternative channels of sales** for their produce **bypassing processors and retail**:
 - a. via **public procurement** contracts(hospitals, meals on wheels, schools)
 - b. via providing **small grants for farmers to explore direct sales** to consumers – e.g. via vending machines
6. **Fund quality public campaigns and citizen movements showcasing food as a driver for health and preventative medicine** and clarifying the connection between food production practices and **wellbeing of nature and community**.
7. **Nudge retailers to offer a fixed margin** for the produce of farmers providing environmental services
8. **Nudge processors to offer a higher price to farmers** providing environmental services

References

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Thank you

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