Staff Mobility to Action Resilient, Restorative, and Regenerative Transitions & Societies

Funded by
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I3X – Guiding Principles

SMAR3TS

- Innovate3X-Igniting Impactful Initiatives, or I3X, should aim to accelerate the understanding/scoping of a challenge (technological, market, societal etc), and the emergence/development of possible solutions. This can be interpreted as e.g. increased technological or societal readiness, once the I3X is completed.
- I3X should have a sufficient scale and scope (i.e. not being too narrowly-defined), and should require multi/cross/inter/trans disciplinary capabilities.
- I3X should align to the core concepts of SMAR3TS – Resilience, Restoration, Regeneration (either R or all Rs).
- I3X should align to (at least) one WP – WPs are the main coordination mechanism of the project, hence I3X should be connected to WPs.
- Any partner can initiate an I3X. Yet, shaping the I3X should be done collectively, and in collaboration with WP leader and SMAR3TS Team.
- At this stage, we are looking for initial I3X, which will be further defined during the Kick Off Meeting – and where engagement across the consortium will be assessed.
- Overall, it is expected that each I3X will lead and enable about 10 person-months of secondment, across the consortium (i.e. not only between the initiator of the I3X and possible contributors), possibly more.
- I3X will serve as guiding instruments for secondments, as well as for events (i.e. hackathons, workshops, showcase)

I3X – About the initiator

Name of Organization: University of Cambridge
Research Group/Department: IfM Engage
Country: UK

1. Background info

Short description of your organization: IfM Engage
Website: https://engage.ifm.eng.cam.ac.uk

2. Research Group/Company Department

Short description: Facilitating knowledge translation from University to practice (industry/government) through the deployment of consulting/education and communication

Link to the website: https://engage.ifm.eng.cam.ac.uk

Contact info: Dr David Lott (CEO). Email: dl362@cam.ac.uk

3. Expertise and available technologies within SMAR3TS project

1. ***Expertise*** *of your research group/department and available technologies:*

Expertise relates to tools/ approaches developed at IfM:
https://www.ifm.eng.cam.ac.uk/research/
Several key areas are put forward:

- Supporting industry and policy for translating science into technology and innovation for nutrition-related challenges
- Supporting agrifood supply chains resilience
- Encouraging digitalisation of SMEs manufacturing to support resilience, restoration and regeneration of manufacturing in the food sector.
- Developing innovative toolkits/practices for food systems' transformation

2. ***Current status*** *of available technologies (incl. TRL) / problematization/solution development (SRL) and expected TRL/SRL to reach:*
The research areas are continuously updated and hence we have approaches that are at most stages in the TRL (from Pilot to mainstream)

4. Examples of strategically relevant Innovate-3X Initiatives

- *Evidence-to-Impact Pathways for Nutrition-Centred Food System Transformation*
- *Regenerative Packaging challenge for food - new materials*
- *Enabling agrifood supply chain resilience*

I3X – Alignment to R3 and to WPs

SMAR3TS domains:

1) ***Specify here:*** *one or several SMAR3TS domains that are relevant to the work of your organization/research and innovation team.*

We are agnostic and have much experience to deploy our approaches in all the 4 sectors (Nutrition, Mobility, Energy and Construction)

2) ***Specify here:*** *alignment of the work of your organization/research and innovation team with one or several SMAR3TS focus areas on Resilience, Restoration, and Regeneration. Share examples.*

On top of the specific projects/I3X areas below, Case studies which describe capabilities include

https://engage.ifm.eng.cam.ac.uk/e-wave-powering-the-future-of-electric-shipping/

https://www.ifm.eng.cam.ac.uk/insights/sustainability/

https://engage.ifm.eng.cam.ac.uk/project/eit-food-roadmapping-case-study/

https://engage.ifm.eng.cam.ac.uk/project/unlocking-the-potential-of-materials-for-quantum-technologies-in-the-uk/

https://engage.ifm.eng.cam.ac.uk/project/future-proofing-controlled-environment-agriculture-with-defra/

I3X Description

Note: *there can be several Innovate-3X descriptions, just duplicate this template slide*

1) Innovate-3X: Evidence-to-Impact Pathways for Nutrition-Centred Food System Transformation

1. Description of Current Stage

https://engage.ifm.eng.cam.ac.uk/project/ypmh-mental-health-support-roadmap/

Transforming food systems through a nutrition-centred lens requires addressing a set of **interconnected and systemic challenges** that span science, policy, innovation and implementation. While evidence on nutrition, sustainable diets and food systems is rapidly expanding, the mechanisms for translating this knowledge into **coherent action, policy design and scalable solutions** remain underdeveloped. These challenges are compounded by fragmented governance, competing priorities, and the need to coordinate multiple stakeholders across sectors and levels. Addressing the outlines challenges within this I3X is essential to enable effective evidence-to-impact pathways for resilient, restorative and regenerative food system transformation.

In addressing the outlined challenge, this I3X requires going through the following stages:

☐Pilot / Proof of Concept

☐Early Implementation

☐Scaling / Mainstreaming

2. Necessary skills and capabilities, across disciplines:

To engage with this work requirements include:

- ***Capabilities to understand, develop and deploy innovation in food systems environments***
- ***Ability to work with different types of stakeholders within the food sector***
- ***Capability to bring key players in the discussion to develop key solutions to main challenges***

3. Examples of challenges that need to be addressed

Specify here: *Please outline which challenges remain unresolved. You may answer in bullet points.*

The secondments under this I3X could focus e.g. on one or several of the following areas:

1. Fragmented evidence landscapes
Nutrition and food system knowledge is dispersed across disciplines, limiting usability for decision-makers.

2. Weak translation from research to practice
Evidence rarely progresses into scalable interventions embedded in real-world systems.

3. Research to food industry translation gaps
There is a need to address how scientific insights can be translated into practice and in particular understand what practices facilitate uptake of scientific results by food industry.

4. Complex multi-stakeholder environments
Nutrition-centred change requires coordination across sectors and governance levels. Development of effective solutions requires collaboration between **researchers, food producers, regulators and innovators/entrepreneurs.**

I3X Description

Note: *there can be several Innovate-3X descriptions, just duplicate this template slide*

2) Innovate-3X: Regenerative Packaging challenge for food - new materials

1. Description of Current Stage

Food packaging plays a critical role in protecting food quality, safety and shelf life, yet it is also a major contributor to **environmental degradation, resource depletion and waste**. Conventional food packaging systems rely heavily on fossil-based plastics and complex composite materials that are difficult to recycle, generate pollution, and undermine circular economy goals.

While significant innovation is taking place in **bio-based, biodegradable and recyclable packaging materials**, these solutions often face barriers related to **scalability, performance, cost, regulatory compliance and integration into existing food systems**. In many cases, packaging innovations focus on material substitution alone, without considering the broader system impacts on food waste reduction, logistics, consumer behavior and end-of-life recovery. This I3X addresses the challenge of moving from **experimental packaging innovations** to **regenerative, system-integrated solutions** that support sustainable food systems, align with regulatory frameworks, and deliver measurable environmental and societal benefits.

The current stage in addressing the outlined challenge is:

☐Pilot / Proof of Concept

2. Necessary skills and capabilities, across disciplines:

To engage with this work requirements include:

Work to bridge academic expertise and industrial needs (e.g. materials, economic, manufacturing, policy, sustainability etc) .

By relying on the Forum's members the person will

- *Map current challenges and forecast future needs for materials to improve sustainability in packaging across the supply chains in the food industry (considering challenges/ specificities of players/ regulatory diversity / etc)*
- *Identify/ evaluate / prioritise challenges*
- *Identify/ evaluate/ prioritise opportunities in materials for packaging that meet the current and long-term needs of the industry*
- *Support the develpment of a roadmap (moving from short- to long-term impact), integrating learning from the mapping about materials advancements and facilitating strategic plans over time*
- *Deep-dive into some of the technical solutions and propose next steps*

3. Examples of challenges that need to be addressed

Specify here: *Please outline which challenges remain unresolved. You may answer in bullet points.*

- Fragmented packaging innovation landscape
New materials are being developed, but without coordinated evaluation across manufacturing, recycling, cost and regulation.

- Short-term vs long-term sustainability trade-offs
Companies must decide how to improve sustainability now while also preparing for future packaging systems and legislation.

- Infrastructure compatibility
Many new materials fail because they do not work with existing sorting, recycling or reuse systems.

- Regulatory and investment uncertainty
Rapidly evolving policy (e.g. plastics regulation, EPR, recycling targets) makes it difficult to make long-term packaging investments.

Example*: How should the food and drink industry and supply chain plan and coordinate to deliver more sustainable packaging – both quick wins in the short-term by taking advantage of the most advanced opportunities emerging from new materials, designs and manufacturing approaches?*

Note*: The project should work across the various disciplines to help bring scientific developments into practice and support the future of packaging sustainability in the food industry.*

I3X Description

Note: *there can be several Innovate-3X descriptions, just duplicate this template slide*

3) Innovate-3X: Enabling agrifood supply chain resilience

1. Description of Current Stage

How can manufacturing become more **resilient** at the factory, supply network and industrial system levels? By investigating the relationship between products, processes and location, we aim to identify and evaluate risk, develop mitigations, and build resilience in a wide range of industrial sectors but with a particular focus on the food and critical mineral sector. We work closely with industry and academic institutions in the UK, US and India.
Geopolitical shifts are reshaping how we produce, distribute, and consume food. Trade tensions, conflicts, regulatory divergence, and climate-related risks are increasingly intertwined with the resilience and sustainability of food supply chains. Thus, there is a need to assess agrifood supply chain resilience related to the following areas:

Functionality: Ensuring nutritional quality outcomes across supply chains.
Availability: Safeguarding stable production and distribution under disruption.
Affordability: Balancing costs and investment strategies for affordable food options.
Accessibility: Leveraging technology and data-driven solutions for equitable access to healthy and nutritious food.

In addressing the outlined challenge, this I3X requires going through the following stages:
☐Idea / Conceptualization ☐Pilot / Proof of Concept ☐Early Implementation
For more info, see also*: https://engage-events.ifm.eng.cam.ac.uk/Agri-FoodSCWorkshop*

2. Necessary skills and capabilities, across disciplines:

To engage with this work, requirements include:

- ***Capabilities to understand, develop and deploy innovation (e.g. digitally led, data led, policy instruments ...) which supports the tackling of the main challenges in food supply chains and ensure their resilience***
- ***Working with different types of stakeholders along the nutrition supply chain.***
- ***Capability to bring key players along the nutrition supply chain (e.g. producers, growers, labels, national policy etc..) in the discussion for the development of key solutions to main challenges***

3. Examples of challenges that need to be addressed

Specify here: *Please outline which challenges remain unresolved. You may answer in bullet points.*

Challenges can be related e.g., to market and business model, technology adoption, sustainability assessment, regulation, policy, technologies, data availability, methods & analysis, technical or methodological gaps, ecosystem building or community development, societal & cultural acceptance of innovations, impact, etc.

Examples of questions that can help you clarify the challenges:

- Market & Adoption: Are there gaps in market analysis, business models, or scalability?
- Sustainability & Assessment: What kind of sustainability evaluation is needed?
- Regulation & Policy: What regulatory, legal, or policy issues must be addressed?
- Technology & Methods: What are technical, data, or methodological gaps?
- Ecosystem & Community development: Are there coordination, stakeholder engagement, or ecosystem development challenges?
- Societal & Cultural: What issues e.g., related to social acceptance need attention?
- Impact: Are there difficulties in mapping, monitoring, measuring, or demonstrating impact?