How to involve the stakeholders in the sustainability assessment process of a technology or food value chain The experience of the EU-FAIRCHAIN project

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How to involve the stakeholders in the sustainability assessment process of a technology or food value chain

The experience of the EU-FAIRCHAIN project

FAIRCHAIN

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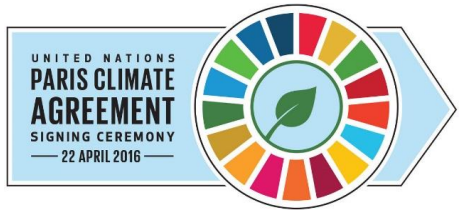
Context



Mismatch between **demand** of the citizen for local, affordable and nutritious food produced in a fair and sustainable way and **supply** of such food by actors of the food value chains

→**Enable small and mid-sized farmers and food producers to scale up and expand production of nutritious food through sustainable food value chains**

- 99,1 % of all EU food companies are SMEs (2.8 Mio workers)
- 70% of SMEs do not engage in any formal R&D activities
- 20% of SMEs are « technology-adopting enterprises »
- 10% of SMEs are carrying out innovative and research-fuelled activities

FOODDRINK EUROPE

(FoodDrinkEurope, 2016)

FAIRCHAIN

EU-FAIRCHAIN Project (2020-2024)

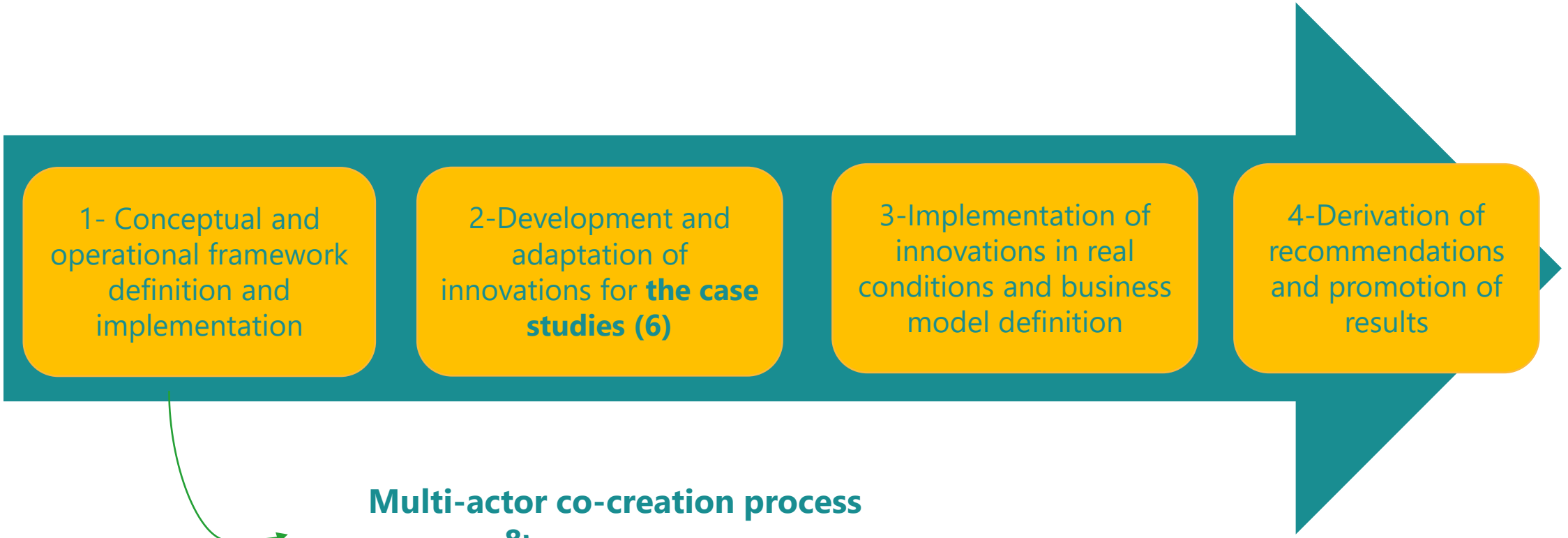
- **Objective** : Test, pilot and demonstrate **technological, organisational and social innovations** that have the potential to support the scaling up and expansion of small and mid-sized farmers and food producers

Acronym	FAIRCHAIN
Title	**Innovative technological, organisational and social solutions for FAIRer dairy and fruit and vegetable value CHAINs**
Topic RUR-06-2020	Innovative agri-food value chains : boosting sustainability-oriented competitiveness under the programme SC 2 “Food security, sustainable agriculture and forestry, marine, maritime and inland water research and the bioeconomy” → Innovation Action
Budget & funding	Overall budget: 8 036 566 € EU contribution: 6 996 636 €
Duration	1 November 2020 – 31 October 2024 (48 months)
Consortium	A total of 22 partners from 8 countries

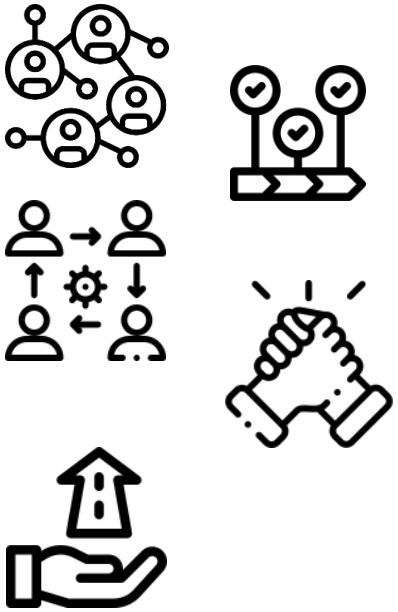
Issues & Innovations at the start of FAIRCHAIN

Main issues	List of anticipated Innovations		
	Technological Innovations	**Organisational innovations**	**Social Innovations**
Better use of co/by-products	Fermented whey-based drink, **CS-Fra** Alternative cleaning agent (vinegar), **CS-Swi**		
Improve packaging and distribution of fresh food liquids	Flexible filling machine using sustainable packaging materials and designed to fulfil hygienic requirements, **CS-Bel**	Distribution with reduction of packaging consumption, **CS-Fra**	
Improve trustworthly traceability and information sharing	Blockchain, **CS-Gre**		
Bring high technology usage to small size actors	Blockchain, **CS-Gre** ICT tool for berry tracking , **CS-Swe**	Sharing of processing equipment, **CS-Bel** and/or infrastructure, **CS-Swi**	Food Innovation Incubator, **CS-Aut**
Developp innovative funding systems			Funding system based on philanthropic income streams, **CS-Bel**
Build networking & better innovation awareness			Food Innovation Incubator, **CS-Aut**

FAIRCHAIN's methodology



Involvment of stakeholders: why ?



- Integrate **expertise** from different stakeholders across the **entire value chain**
- Generate **new perspectives** on each of the case studies
- Ensure **fair(er) distribution** of benefits and risks along the value chains
- **Share scientific knowledge** on sustainability assessment to ensure the successful implementation and dissemination of innovations
- **Design the new/reconfigured value chains** in each case study
- Foster **collaboration** and partnerships among stakeholders that can thrive and grow **beyond the duration of the project**.

Key aspects/challenges

- **Representativity**: Stakeholder identification and involvement according to PESTEL, affectedness and influence, covering all stages of the value chain
- **Early involvement:** influence/ give stakeholders the opportunity to shape (parts of) the case study
- Openness for **different kinds of innovations** (technological, organizational, social)
- Very **clear communication** and **fair and transparent** decision-making and conflict-solving processes

Methodological framework

3 steps
→ Illustration with the CS-Fra

Production of innovations

Sustainability assessment of innovations in the value chain

Involvment of stakeholders

- Selection of the innovations
- Definition of goals to achieve
- Identification of the most pressing concerns for each case study
- Definition of actions and competencies required to implement the innovation

- Development of the assessment methodology
- Understanding and sharing of the assessment results
- Dissemination of results

Multi-actor co-creation process

Multi-perspective assessment framework

CS-Fra : Current situation versus aim

The Vevy cheese dairy

- Processing 1
  - Pressing
    - Slightly acidified whey
  - Sweet whey
  - Sweet whey
- Processing 2
  - Molding & maturing
    - Slightly acidified whey

Preconcentrator plant

Drying plant

Long dominant value chain

Wastewater treatment plant

Comté

PDO (Protected Designation of Origin) cheeses

Tomme

Raclette

Morbier

CS-Fra: Current situation versus aim

→ Find a new route adapted to small and mid-sized actors at a regional level for upgrading value of whey by developing innovative fermented whey-based drink

The Vevy cheese dairy

Processing 1

Processing 2

Pressing

Sweet whey

Sweet whey

Molding & maturing

Comté

PDO (Protected Designation of Origin) cheeses

Slightly acidified whey

Preconcentrator plant

Drying plant

Slightly acidified whey

Wastewater treatment plant

Fermentation
+ « zero waste » distribution mode
(Returnable bottles / Bulk distribution)

Tomme

Raclette

Morbier

CS-Fra : The technological innovation

Development of the fermented whey-based drinks

- Determine process conditions to stabilize wheys (lab-scale → pilot)

  Obj: Remove native cheese whey micro-organisms with minimal impairment of whey organoleptic properties

- Screen and select the micro-organisms on wheys alone
  - Screening of > 125 lactic acid bacteria (or consortia of yeasts + lactic acid bacteria) on ≠ wheys to identify the strains with the best acidification and sensorial properties

    →Selection of 20 promising strains on Comté acid whey and 32 strains on Morbier sweet whey

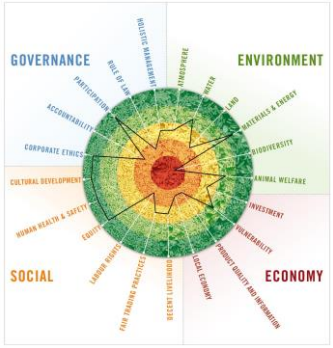
- Carry out fermentation assays on wheys mixed with fruits/vegetables/herbs
  - → Over 15 flavours (fruit juice or herb) were tested,
  - → Selection of **4 bacteria strains** (/ whey type) working well in association with (at least) one flavour
  - → Some of the best prototypes were tasted and validated by CS-Fra team

Involvment of stakeholders in the assessment framework

Development of the assessment methodology (Step 1)

→Selection of appropriate indicators for the Case Study from the SAFA guidelines (on which the innovation will potentially have an impact)

Indicators from SAFA guidelines (Sustainable Assessment of Food and Agricultural systems, FAO)



	Indicators	Belgian (downscale)	Belgian (Upscale)	Swedish (Thai pickers)	Swedish (local pickers)	Gree	French	Swiss Vi egar/ Bi char
Economic	Profitability	x	x	x	x		x	x
	long term profitability, Business plan							
	Stability of Supply			x	x			
	Guarantee of Production Levels							
	Market stability and diversification	x	x					
	Food Safety		x					
	Food Quality							
	Labeling, traceability and certification					x		
	Regional Workforce							
	Local Procurement							

→Ranking the indicators / Weighting of indicators through survey, in order to combine both scientific and field perspective when evaluating: pair-wise comparison of indicators

from 1 for "equally important" to
5 for "extremely more important"

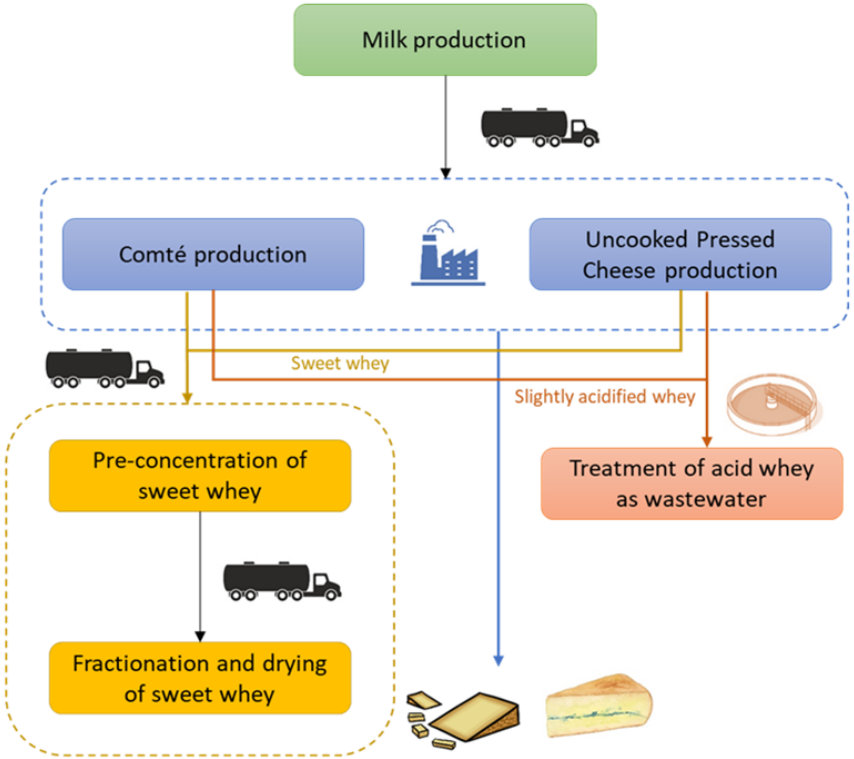
5 4 3 2 1 2 3 4 5

Profitability ○ ○ ○ ○ ○ ○ ○ ○ ○ Local employement

Involvment of stakeholders in the assessment framework

Understanding and sharing of the assessment results (Step2)

Ex: ACV of the baseline



Functional unit: "one-year cheeses production and whey ends-of-life at Monts & Terroirs Vevy production site"

			Milk production	At cheese factory	Whey valorization	Transports	Wastewater treatment
Climate change (CC)	1,53E+07	kg CO2 eq					
Ozone depletion (OD)	4,66E-01	kg CFC11 eq					
Ionising radiation (IR)	1,29E+06	kBq U-235 eq					
Photochemical ozone formation (POF)	2,07E+04	kg NMVOC eq					
Particulate matter (PM)	1,09E+00	disease inc.					
Acidification (Acid)	1,59E+05	mol H+ eq					
Eutrophication, freshwater (Eutro-F)	8,38E+02	kg P eq					
Eutrophication, marine (Eutro-M)	2,74E+04	kg N eq					
Eutrophication, terrestrial (Eutro-T)	6,97E+05	mol N eq					
Land use (LU)	8,78E+08	Pt					
Water use (WU)	3,10E+06	m3 depriv.					
Resource use, fossils (Res-F)	6,07E+07	MJ					
Resource use, minerals and metals (Res-M)	1,52E+01	kg Sb eq					

- Remove preconceived ideas
  - The management of whey is not a hotspot (milk production and whey drying);
  - Transport of whey from cheese dairies to valorization sites is not negligible → Production of the innovative drinks as close as possible to the cheese dairy + Transport of the drink at ambient temperature
- Support the eco-design of the drinks / comparison of the drinks with others

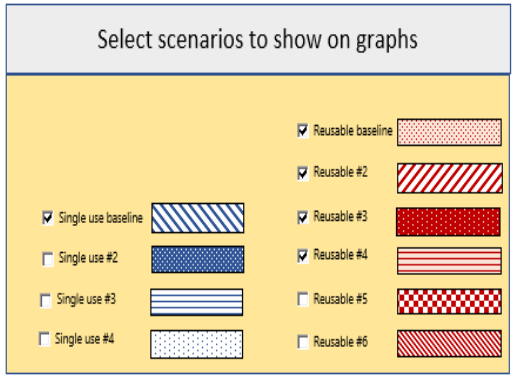
Involvment of stakeholders in the assessment framework

Dissemination of results (step 3)

→ Development of specific ready-to use and user-friendly tool adapted to stakeholders (ex: tool for returnable bottles)

TABLE 1: Single use scenarios		Single use baseline	Single use #2	Single use #3	Single use #4
Packagings					
Single use bottle					
Volume	L	1			
Weight	kg	0,390			
Material	type	White glass			
Transports					
Distances					
From bottle provider to drink transformation	km	365			
From transformation to stores	km	73			
From stores to consumer	km	4			
		Reset with initial values	Copy the baseline	Copy the baseline	Copy the baseline

TABLE 2: Reusable scenarios		Reusable baseline	Reusable #2	Reusable #3	Reusable #4	Reusable #5	Reusable #6
Packagings							
Reusable bottle							
Volume	L	1	1	1	1		
Weight	kg	0,627	0,627	0,627	0,627		
Material	type	White glass	White glass	White glass	White glass		
Return rate	%	75%	30%	40%	50%		
Rejected rate (from collected)	%	2%	2%	2%	2%		
Transports							
Distances							
From bottle provider to drink transformation	km	365	365	365	365		
From transformation to stores	km	73	73	73	73		
From stores to consumer	km	4	4	4	4		
From stores to cleaning facility	km	30	30	30	30		
From cleaning facility to transformation	km	30	30	30	30		
		Reset with initial values	Copy the baseline	Copy the baseline	Copy the baseline	Copy the baseline	Copy the baseline

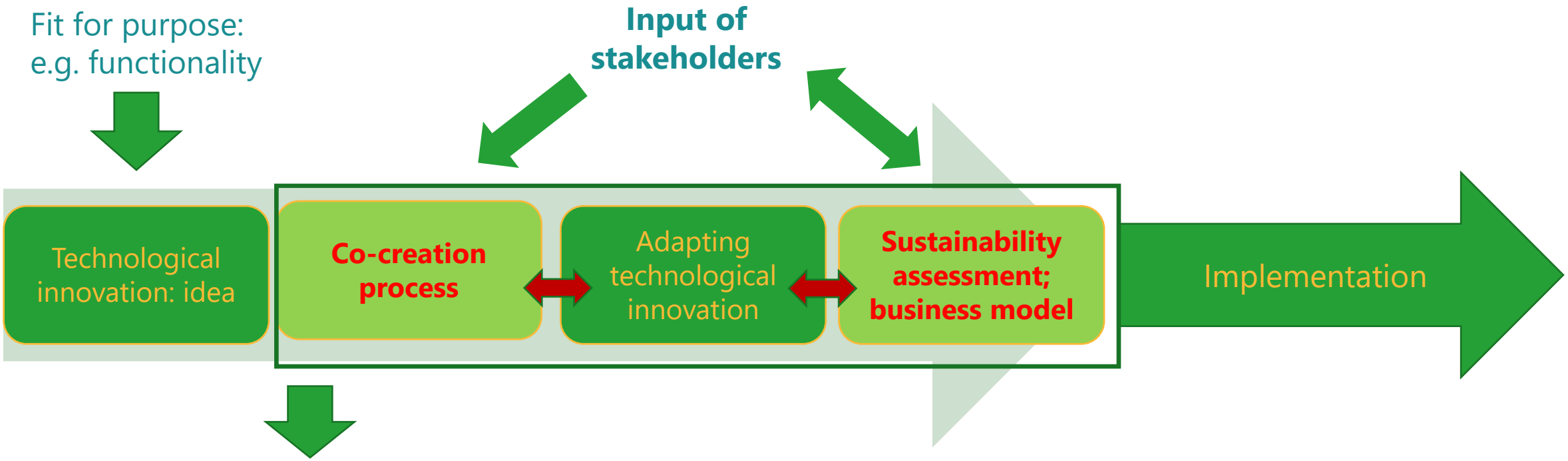


Free (usable by small producers)

Simplified (easy data collection)

Robust (based on strong scientific methods)

Take home messages



→ Stakeholder involvment is a pre-requisite
  → To ensure the relevance and efficiency of the assessment sustainability framework
  → to achieve successful implementation of (technological) innovations

Keep in touch with FAIRCHAIN!

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Thank you for your attention !

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