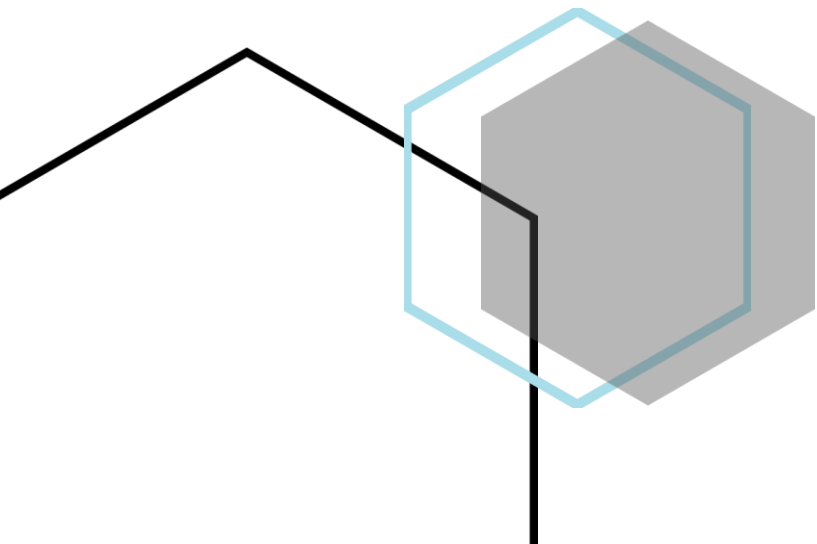


From Farm to Fork – Revolutionizing Food Systems

**A Strategy White Paper for the Development of
a Better Startup Ecosystem
– DEEP ECOSYSTEM LEADERSHIP COMMUNITY**

In partnership with





From Farm to Fork – Revolutionizing Food Systems

A Strategy White Paper for the Development of a Better Startup Ecosystem

On the Authors

DEEP Ecosystems is a world-wide community of tech ecosystem builders who collaborate to build more transnational, inclusive, entrepreneur-driven and impactful innovation systems.

The main activities of DEEP are the [Startup Heatmap Europe](#), an unparalleled database on ecosystem development metrics, the [DEEP Ecosystem Conference](#), which brings together a community of more than 400 professional ecosystem leaders twice a year. Finally, DEEP organizes the [DEEP Startup Ecosystem Accelerator](#) which directly supports the growth of local ecosystems. DEEP regularly organizes peer-knowledge exchanges and educational formats for ecosystem builders ranging from Ecosystem Hacks, Data Trainings and Full-Scale Educational Programs.

On this Publication

The [DEEP Ecosystems Conference](#) on 15th April 2021 brought together 175 practitioners and experts from the startup scenes of more than 45 countries to have data-driven discussions on the most pressing challenges their ecosystems face.

The event evolved around 5 deep dive topics ranging from AgriTech and sustainable food production to diversity and female entrepreneurship. Each of the topics was prepared in-depth by a research team and the findings shared with all participants before the debate. Combining the knowledge and insights of the whole DEEP Ecosystem Leader community Strategic White Papers are formulated that aim to inspire everyone in the startup scene and open up a perspective of how we can build a more transnational, inclusive, entrepreneur-driven and impactful ecosystem.

The DEEP Dive on AgriTech was co-hosted by the Yield Lab Ireland.



Contributors



David Bowles
Investor at The Yield Lab



Igor Oliveira
European Startup Initiative
Member & UN consultant
on sustainable food
production



Razvan Valceanu
CEO Motii Tara de Piatra



John Carrigan
Investment Director at The
Yield Lab



Matija Zulj
CEO & Founder @ AGRIVI



Thomas Kösters
Co-Founder & Managing
Director DEEP Ecosystems



John Carrigan
Investment Director at
The Yield Lab

AGRIFOOD IS A FAST-CHANGING MARKET

From consumers to retailers and farmers, we can observe a big transformation and growing interest in sustainability in the agrifood sector.

“At Yield Lab, we do our best to map the problems that need to be solved in agriculture and food.”

The term Agrifood combines 'agritech' and foodtech' to represent an integrated view of the agriculture and food industry and the innovations that are driving change through the value chain, from farming inputs to food waste management, with production, distribution and consumption ranged somewhere in between.

In the context of technology and innovation, the traditional approach has been to address the two sides of the food systems value chain separately, where **Agritech** dealt with the application of technology for improving agricultural output, while **Foodtech** referred to the application of technology for the production and consumption of food.

Why Agrifood is the right way to address the subject

The global food system impacts climate around the world. In addition, environmental degradation and sustainability have emerged as key concerns for mankind that future generations will be impacted by. European researchers have determined that more than a third of all man-made greenhouse gas (GHG) emissions are generated by food systems, with an annual generation of 2 tons of carbon dioxide equivalent (CO₂e) emissions per person. The database that enabled researchers to reach this conclusion, known as EDGAR-FOOD, took over a year to complete.

Top 5 Facts on Agrifood sector scene in Europe and worldwide

- The EU's Green Deal was announced in 2020 with the Farm to Fork strategy aiming to make food systems fair, healthy, and environmentally friendly.
- Quasi-exponential growth in Agrifood as startup investments worldwide reached more than 50bn USD in 2020.
- With only 20bn USD invested in agrifood since 2010, Europe cannot be considered a key player in the transformation of food systems by startups (own calculations based on Crunchbase).
- Asian Agrifood startups raised close to 70bn USD since 2010, North American 50bn USD.
- 2017 was a key year to consolidate Asia's position, with the emergence of Softbank and Alibaba as mega investors.



If it is being caused by food systems, it logically follows that food systems should play a role in its management and control. Innovation in food systems is needed for **environmental management**.

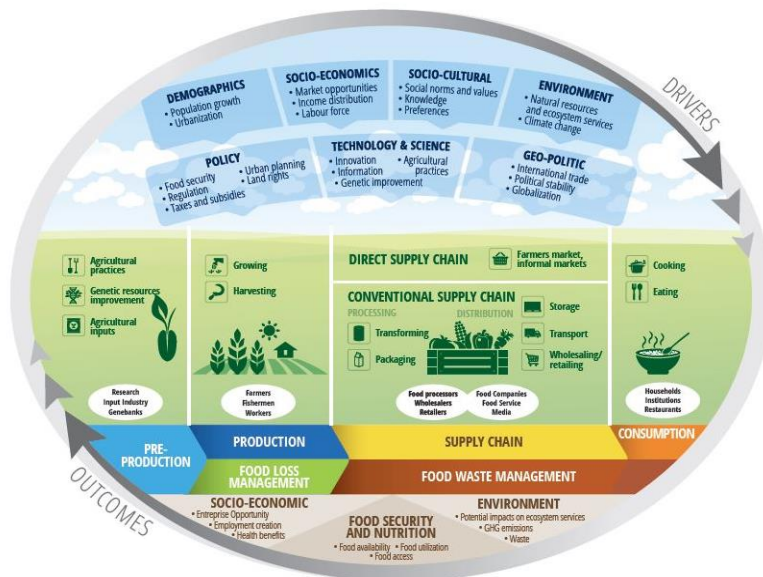
Production, distribution and consumption of food are a **part of the same supply chain**. With innovation we are able to connect these dots on the supply chain in previously unknown ways and revolutionize the food system to be globally fairer and more sustainable. This is where agrifood comes in.

On top of these changes, the modern consumer is becoming increasingly sensitive to the conditions in which the food she is consuming is grown and processed, and its impact on life on Earth as well as human health. According to EDGAR-FOOD lead researcher Adrian Leip, “EU citizens expect sustainable food with low greenhouse gas footprints.”

The good news is that there is a growing universe of startups and venture capitalists straining at the leash to disrupt the agricultural and food industries; the agrifood universe, in ways where it is

becoming difficult to distinguish where ‘agri’ ends and ‘food’ begins.

In this scenario, bringing agricultural and food together as ‘agrifood’ is the logical way forward.

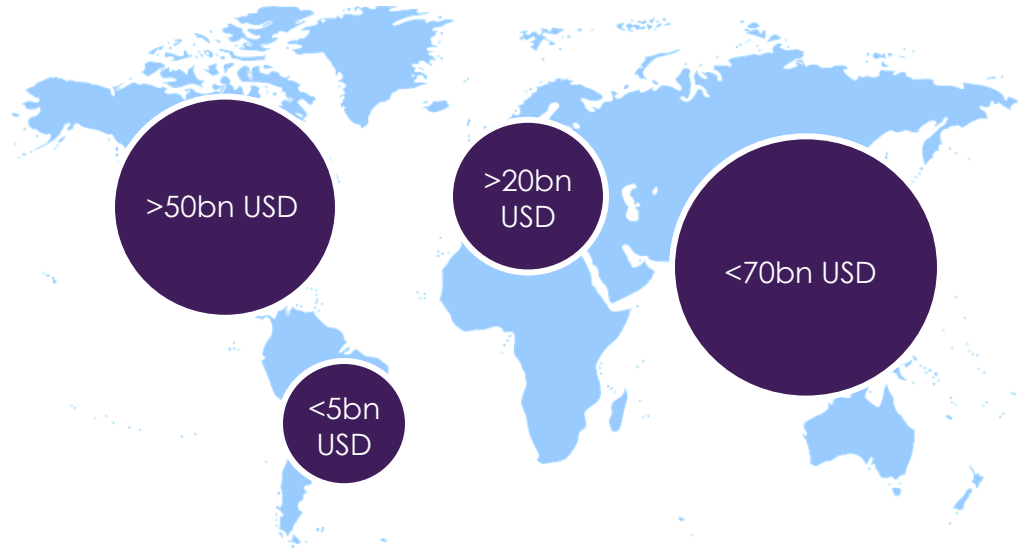


A Sustainable Food System Framework that recognizes innovation as one of the drivers of change.

Source: The Consultative Group for International Agricultural Research (CGIAR)

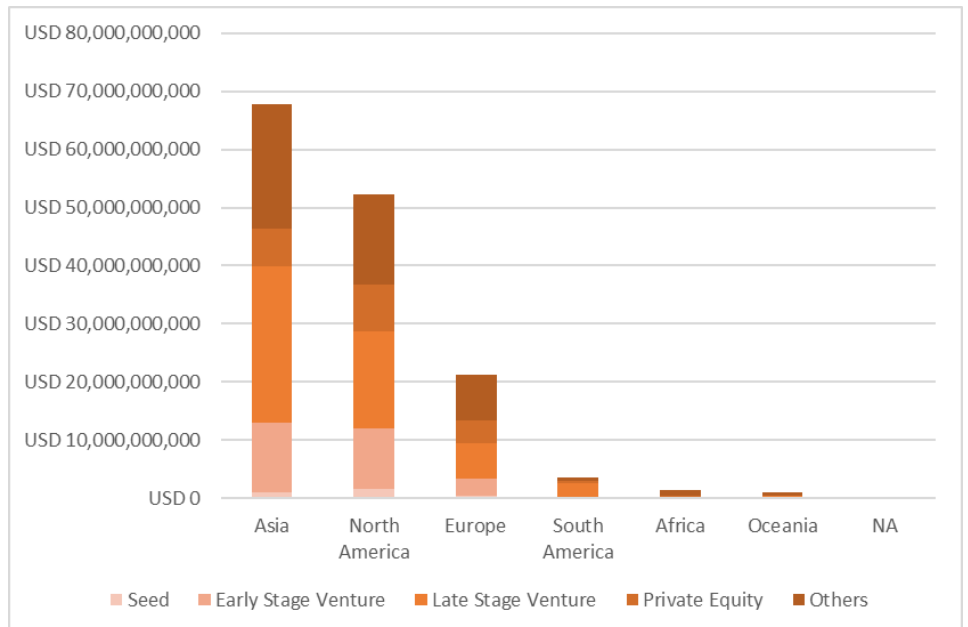


Cumulative agrifood investments 2015-2020



WHERE IN THE WORLD IS THE AGRIFOOD TREND THE STRONGEST

Total Investments in agrifood startups by region and stage



Source: Own calculations based on Crunchbase



Matija Zuli
CEO & Founder @ AGRIVI

“As a farm management startup, we tried multiple go-to-market approaches until we found the one that works. Understanding the supply chain-related needs of food companies was key for us to find a scalable business model. Local players that hold relationships with farms, such as agriculture retailers, are also important.”

The Consultative Group on International Agricultural Research (CGIAR) has drawn up a framework for a sustainable food system. The framework maps out the value-adding activities occurring in food systems, as well as the three key outcomes; socio-economic, environment and food security & nutrition.

The **socio-economic** outcome include enterprise opportunity, employment creation and health benefits. The **environment** outcome cover potential impact on ecosystem services, GHG emissions and waste. **Food Security & Nutrition** outcome address areas like food availability,

food utilization and food access.

In addition to the traditional Demographic, Socio-Economic, Socio-Cultural, Environment, Policy, and Geo-Politic drivers of change in the system, CGIAR has recognized Innovation through Technology & Science as one of the drivers.

No time to lose in adoption of this approach

With the aim of making food systems fair, healthy and environmentally-friendly, the **Farm to Fork Strategy** has been made an

integral part of the Green Deal introduced by the European Commission in 2020. Insights gained from research such as the one being done by EDGAR-FOOD, can guide such schemes with the help of data, and the startup ecosystem can build on the momentum created with their introduction.

Startup investments in agrifood are experiencing a quasi-exponential growth, with some estimates putting them at over USD 50bn in 2020, a five-fold increase in about seven years, with a steep climb in 2019 and 2020.

With this start already having been made, now is the right time to become active and start investing time and energy



into joining forces and building a better agrifood eco-system. A concerted effort can bring about a significant change in the status quo.

What are the narratives shaping the food systems debate?

The desire to **enhance efficiency** in food systems and bring down wastage is a key driver of the narrative. This can be achieved by creating a food-system specific circular economy that is restorative and regenerative. The development of on-demand distribution and tech-intensive supply chains will further enhance efficiencies. The debate on efficiency is also

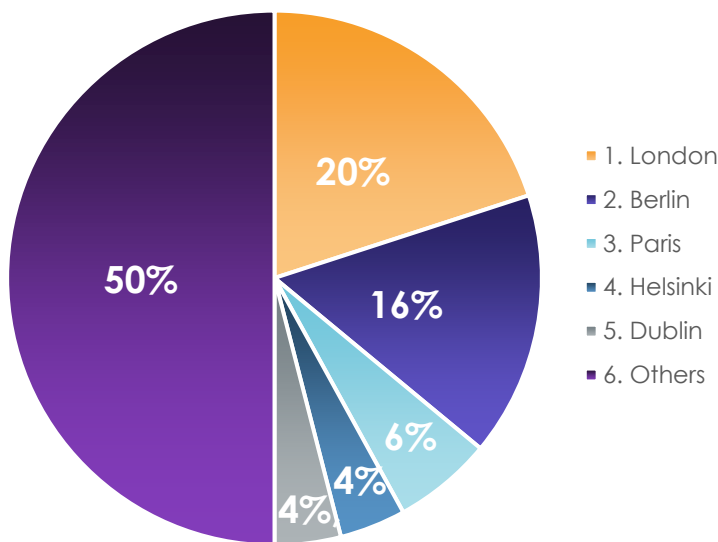
fuelled by the need to **change consumption patterns** (with plant-based and synthetic nutrition).

Taking commercial agriculture and food processing to **underprivileged locations** is another important element in the narrative driving the food systems debate. The global population is expected to reach 9 billion by 2050. Feeding that population is a challenge the world needs to find ways to address, in time. It is expected that agricultural management technologies and agri-fintech companies will play a key role in this effort at **geographical redistribution** and make techniques and technologies available where they can be best utilized.

Global Dynamics: Agrifood is big and getting bigger

We analyzed 5,116 agrifood deals from 1.5 million to 4 billion dollars since 2010 on Crunchbase. Only deals listed as Agriculture and Farming or Food and Beverage were included. Grants, product crowdfunding, secondary markets, post-IPO money and non-equity assistance were all excluded from the data-set that was analysed.

With USD 70bn raised by Asian Agrifood from 2010 till date, Asia emerged as the key location for Agrifood investments. Late-stage venture plays a key role in the Asian agrifood scene, which shows an appetite for scaling up tested business models.



Source: Own calculations based on Crunchbase

Percentage of Agrifood Investments per City in Europe.



David Bowles
Venture Capital Investor at The Yield Lab

"Climate mitigation is a key shaper of the innovations to come in the AgriTech sector. Also Biosciences and IoT solutions will be important. Europe's focus is on Deep Tech solutions for Agriculture."

2017 can be considered to be a watershed year in which Asia consolidated its position, with the emergence of Softbank and Alibaba as mega investors in the sector.

North America followed close behind with USD 50bn. In comparison to Asia and North America, with USD 20bn invested in agritech in the same period, Europe cannot be considered as a key player in the transformation of food systems by startups, at this point in time.

Transactional business models (distribution, consumption) dominate the scene in Asia. Moreover, in percentage terms of the total

investment pie, they have been going up in the last ten years.

European Dynamics: Playing Catch-Up

The annual average investment has grown substantially from USD 1.3bn between 2013 and 2016 to USD 3.4 billion between 2017 and 2020, even though 2020, with an investment of USD 3bn, experienced a dip in comparison to the USD 4.3bn invested in 2019.

European investments have tended to favor tech-intensive (non-transactional) agrifood startups, in comparison to the preference for transactional startups in Asia.

Barriers for agrifood startups in Europe

Despite the growth in investments, Europe continues to lag a long way behind Asia and North America. What are the reasons?

Slow reinvestment

Traditional food conglomerates, which tend to be family-owned, dominate the distribution channels. They sometimes invest in startups following rather conservative innovation theses which do not necessarily use the different tried and trusted tools like corporate venture capital, acquisitions and proofs of concept, in a balanced way designed to maximize innovation. Their incumbent bias might also lead to suppression of the most



disruptive value propositions that could be emerging in Europe.

Fragmented markets

The many different languages spoken in the countries that constitute the region, make sales more complex in the agricultural and food worlds. Unlike urban communities that tend to be more connected with the outside world, agricultural communities are more likely to practice traditional methods and patterns, creating a need to approach them in ways they are comfortable with. Language is one manifestation of this mindset. John Carrigan of The Yield Lab

believes that “Full localization, including product translation, is necessary to sell to farmers.”

Regulatory barriers only serve to make selling an even more complex process. Though authorities may have the benefit of their constituents at heart, multiple local regulations often end up obstructing the smooth flow of business transactions.

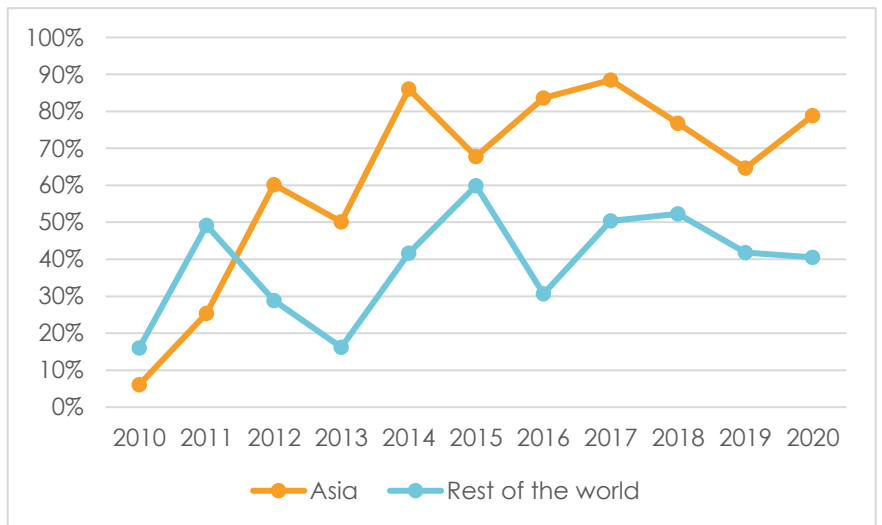
Lack of vertical knowledge of investors

Some vanguards in agrifood are capital-intensive because they require (bio)-technology development. Capital-intensive nexuses, like that of food and biotech,

are less visible, including to investors, creating a deficit of knowledge. Non-specialized investors do not understand them well enough to be comfortable investing. The fallout is that these capital-intensive nexuses are unable to contribute as much to food systems as they possibly could, if these limitations were to be addressed.

Fraction of USD invested in transactional businesses

(e-commerce, grocery, retail, delivery, customer service, coupons)



Source: Own calculations based on Crunchbase



Razvan Valceanu
CEO Motii Tara de Piatra

AGRIFOOD INNOVATION IN ROMANIA

A DEEP Ecosystem Accelerator Project

Razvan Valceanu leads the Skills Upgrade in Mountains of Apuseni project in Romania, with which he participated in the DEEPSEA program and brings agrifood innovation to Romania's mountain regions.

"We have great advantages and benefits on the "organic products" market niche, offered by our protected geographical area."

Who are you and what is your project all about?

Motii Tara de Piatra is an Intra-Community Development Association from Romania, focused on the sustainable development of the mountain-based community of the Apuseni Mountains.

Currently we have 80 members, represented by the heads of city councils and mayors, united with the mission to develop and implement the first global strategy for Apuseni Region.

S.U.M.A. Project targets the creation of a platform for skills development of farmers, startups and SMEs from our mountainous

region.

We look to establish food trial hubs between local farmers and modern food brands from outside the region. Here, the local farmers will bring their ingredients and traditional knowledge and work together with modern food brands to develop unique recipes based on meat, dairy, cooked food and drinks. This collaboration will also contribute to the development of a food community of farmers and brands with origins in the Apuseni Region.

This solution takes care of the entire ecosystem. We educate the farmers with workshops, we help them implement the right tools and to grow on a platform

that offers to consumers a transparent and short value-chain.

Why is AgriFood a unique opportunity for Romania?

Although Romania accounted for about one third of the EU's farms, they accounted for only 3.4 percent of the EU's standard output, according to the statistics office.

Agrifood manufacturing makes major contributions to employment and the food processing industry has experienced fast growth during the last years. The modernisation process must continue, so that all farmers will use modern manufacturing facilities and technologies and meet the 2030 SDG's.



Who are the food brands you'd like to address with your accelerator in Romania?

We target start-ups and food brands focused on organic, artisanal or craft products, potentially with certificates from the mountains region, and produces with traditional and hand-made cooking skills. At the moment they don't have own food production but rent facilities, or look to rent. These entrepreneurs want to expand their production and are willing to invest into long-term partnerships. The range of categories varies from retail and online shops, to restaurants or new food products.

Our role inside the accelerator is the matchmaking of all ingredients. We will enable the farmers to cooperate with startups and search and select the food brands, by offer them flexible and custom programs.

At this moment what is the biggest challenge for you?

Our challenges are global, European and local.

By 2050, the agri-food sector will have to feed approx. 2.3 billion more people, leading to an increase in world-food needs and productivity in a sustainable way.

All farmers, food companies and retailers will be challenged to continue to improve food quality and will have to adapt to the new consumers. These will be more aware of a range of issues including food safety, health benefits, production systems and innovations, sustainability and not lastly, food origins. All these trends underlie the ambitions set out in the EC initiative FOOD 2030 and associated action plans to evaluate the "impact" of any activity / process on sustainability.

The JRC developed a new global food emission database (EDGAR-FOOD), estimating that more than a third of all man-made greenhouse gas (GHG) emissions are generated by food systems, with an annual generation of 2 tons of CO2 emissions per person.

In line with global trends, Europe will see an increase in urbanization. Compared to 2011 levels, it is expected that the total urban

population of Europe to increase by about 10%, while the rural population will decrease by 2.7%. Rural areas in Europe face the largest demographic threats and this will restrict the supply of labor in agriculture and threaten the vitality of rural areas per ensemble.

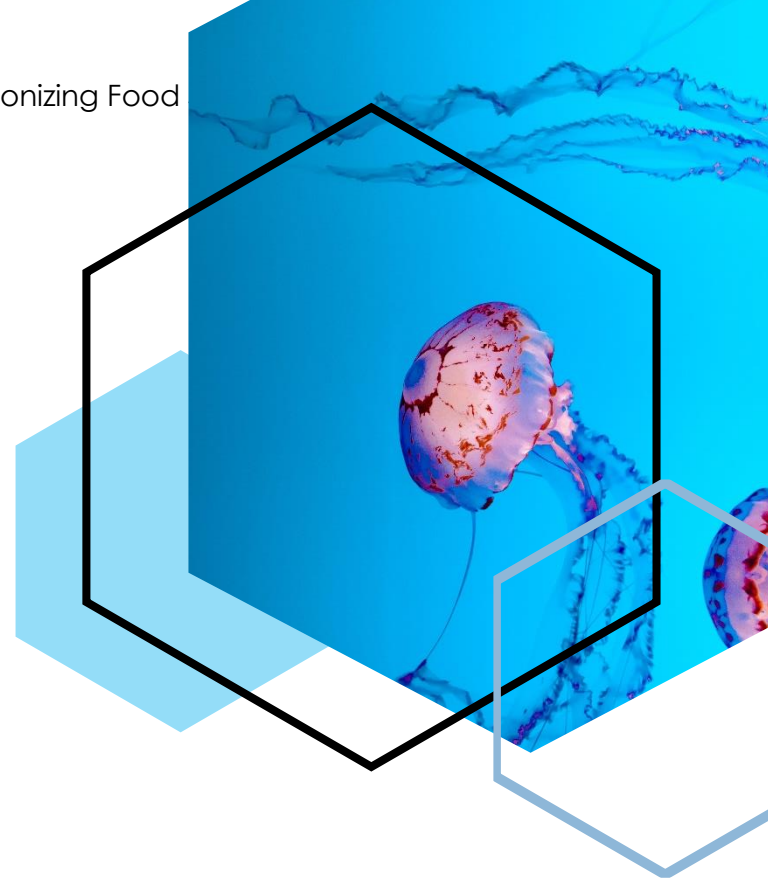
Agriculture is not just about producing food but also the space in which we live, the rural environment and the rural population. Rural areas provide natural resources that need to be maintained and protected, and the farmers are considered the "guardians" of rural areas.

Development of the farmers is an essential element for Apuseni Region and our project had to consider also that in Romania there are major differences between rural and urban areas. Apuseni Region is marked by a significantly higher level of poverty and aging population.

Our success will greatly depend on the efficient exploitation of the existing land, increasing the productivity and competitiveness of the farmers. A strong integration of the value-chains and the consolidation of the farms are the present efforts to transform the raw ingredients and the traditional products into specialized agrifood products, with high added-value.

LEVERAGE POINTS FOR THE EUROPEAN AGRIFOOD ECOSYSTEM

An understanding of challenges provides an opportunity for a roadmap that may be able to address the. What are the solutions suggested for invigorating the agrifood investment scene in Europe?



1) Empower startups with knowledge of agrifood conglomerates and corporates

Startups need to know the **innovation theses of agrifood conglomerates as well as corporates in related sectors** to be able to offer the right solutions. Ecosystem builders could help in mapping these theses. It could be as simple as creating comfort for investors and stakeholders by putting the message across in the right language.

2) Develop B2B2C distribution models

Startups need to define and constantly iterate their channel policies to be able to utilize corporates as channels. A beachhead needs to be established for **local business development** as well as to access the headquarters of each corporate. Influencing corporate decision-making is a slow and elaborate process, with a number of stakeholders involved who will look at each opportunity from different angles. Ecosystem builders could play this role.

3) Suppliers of ERP solutions can play matchmakers

There are many different relationships that are shared by players in an industry and bind them together in one way or another. In this age of digitization, software is one such powerful tool that is used by almost everyone. Agrifood-specialized **ERP and supply chain management software** can be great channels in this effort. Ecosystem builders working from locations in which these software players are located, can play a key role in mediating their relationships with startups.



A starting point could be this select list of specialized ERP software solutions in the food industry:

- JustFoodERP
- bcFood
- SI Foodware NAV
- Inecta Food
- Foodware 365

4) Focus on a few cities with capital-intensive startup scenes

Cities with capital-intensive startup scenes (e.g. biotech in food industries) need a boost to their visibility. This boost can be facilitated, if not entirely provided, by ecosystem builders. It has been seen that cities that have a natural potential for the creation of a nexus of this nature tend to have weaker startup scenes, which reduces their visibility to investors. Startups in these nexuses and locations also tend to have lesser access to mentors who have been through the full investment cycle (from bootstrapping to exit) at least once and may be able to guide them through the process. For example, Helsinki and Dublin, two cities with relevant agrifood-biotech investments, seem to have a relatively unexplored potential in creating a nexus between agrifood and healthtech.

5) Give priority to verticalized investors with promising track records

Verticalized investors with promising track records need to be prioritized by Limited Partnerships (LPs), either public or private. They should replace country-specific investment mandates enforced by LPs, as the startup phenomenon does not respect geographical boundaries, just like it does not limit itself to agri or food. Matija Zuli of Agrivi agrees and says that “A lot of the money is going to country-specific investors. This makes the lives of entrepreneurs harder, as capital seems to be tied to borders that do not exist in terms of our target markets. Especially when you are too early for growth capital.”

6) Implement data standards

Implementation of **data standards** in agriculture and food, including food traceability from farm to waste management, can help minimize market fragmentation. Implementation of standardization will also build confidence and facilitate accurate measurement. Ecosystem builders can play a role by lobbying for this to happen. Efforts are already underway. **Agrirouter** is a consortium of well-known agricultural technology companies (currently 16 shareholders), who have jointly recognized that Farming 4.0 only works if data exchange is possible across manufacturers and products. It was founded in Germany in 2014.

7) Convert agri-fairs to agrifood innovation festivals



Fairs and events are an integral part of the agricultural life, with farming communities being normally too thinly spread out for regular interaction to be feasible. By embedding agri and food tech into trade fairs, a much larger segment of the population involved in these enterprises will be exposed to the innovation possibilities. Agri and food festivals should not be limited to being agri and food festivals. They should be turned into **agrifood innovation festivals**. Ecosystem builders need to work with festival organizers for this to happen.

8) Establish local business development teams and sales channels

Doing this can help in overcoming the challenges posed by differences in language and trade barriers. A sales team tasked with promoting sales will make efforts to create channels for it in a manner that individual producer may not have an inclination or resources for. Who knows, this could well be an idea for a **dedicated startup** in the agrifood space, with initial support from ecosystem builders.