

**Carmen Beatrice PĂUNA**  
**Tiberiu DIACONESCU**  
Institute for Economic Forecasting  
Romanian Academy

# KNOWLEDGE BASED ECONOMY VS. SUSTAINABLE AGRO-FOOD SYSTEMS; BEST PRACTICES

Case  
Study

---

## Keywords

*Sustainable development,  
Agriculture paradigm,  
South East Europe agro-food networks*

---

## JEL Classification

*R11*

---

## Abstract

*Knowledge based economy, found in more than one fields, started – considering agriculture – from a transition premise towards sustainable agro-food systems.*

*The conceptual boundaries between the two major paradigms on sustainable development of agriculture, namely the agro-industrial paradigm and the integrated territorial paradigm, is used nowadays for teaching and research purpose, as a comparison basis with an ideal case, mostly because we only have hybrid models which tend to coexist, always improving the food and goods production, also promoting innovative agro-food systems.*

*This paper highlights the idea that the establishment of an institutional and legal framework, will have a catalytic role acting as an engine of economic growth and boosting the development of agricultural systems by mobilizing entrepreneurs in agriculture and related areas. In this regard, we present best practices of economic actors engaged in meta network of agriculture clusters.*

Per World Bank statement, sustainable agro-food systems represent a „network of organizations, enterprises and individuals focused on bringing new products, new processes, and new forms of organization into economic use, together with the institutions and policies that affect their behavior and performance. The innovation systems concept embraces not only the science suppliers but the totality and interaction of actors involved in innovation. It extends beyond the creation of knowledge to encompass the factors affecting demand and use of knowledge in novel and useful ways” (World Bank 2006, vi–vii).

## THE AGRICULTURE DEVELOPMENT PARADIGMS

**The agro-industrial paradigm** which has been in place in the last 30-40 years (Marsde, 2003), and has received the support of EU’s Common Agricultural Policy (CAP) and the World Trade Organization’s Agreement on Agriculture (Van der Ploeg, 2000, knows a conceptual and practical standpoint improvement because of contemporary engineering of agriculture processes with emphasis on organic farming.

For example, one must mention the benefits of cost reductions – due to advances in agriculture’s technology – for updated food production, which is ever so present within industrial parks, all based on green energy (Veldkamp et al., 2009) or for modernizing the food processing using new industrial techniques (Scrinis, 2007).

In this context, we are witnessing a continuous industrialization and globalization of food supply chains, standardizing and insuring them using international rules and schemes (Marsden, 2003).

By comparison, **the integrated territorial paradigm**, that is required in recent years, seeks to strengthen the capacity of agricultural systems to value regional and social resources within the geographic proximity (Watts et al., 2005 and to integrate with other activities such as the conservation of nature and landscape, tourism, health and education (Renting et al., 2003; 2010). This new concept reflects the importance given to food quality and specific local production, depending on the livestock systems, collaboration, cultural traditions, consumer preferences, in contrast with the use of standards of agro-industrial approach (Sonnino, Marsde, 2006).

This conceptual delimitation of the two types of paradigm serves for teaching and research purposes, as a basis of comparison with an ideal case, mostly because we only have hybrid models which tend to coexist, always improving the food and goods production, also promoting innovative agro-food systems.

We should mention that the spread of integrated territorial governance model is limited (among other things), that the initiatives in this respect are manifested locally, on a smaller scale, and the strength of disseminating good practice is quite low. One solution could be to encourage local initiatives that incorporate the most essential elements of the value chain, such as "food hubs" using specific marketing channel (Morley et al., 2008).

Supporting territorial integration paradigm could also be achieved through a suitable local level system of governance, based on appropriate strategies along with public-private partnerships, increasing the role of civil society, which in turn could contribute to the sustainable development of farming systems.

Moreover, the integrated territorial development model is characterized by an increase in the diversity of institutional and societal partners involved. Regarding the role of public institutions, policies are no longer determined mainly at national or European level, but through regional governments and local authorities that need to acquire a stronger role in the development and implementation of new agricultural policies. The Agricultural Policy is currently conducted in close connection with policies dedicated to public health, climate change, education, sustainable development, involving both government and regional institutions along with other stakeholders not dealing necessarily with rural development, such as authorities in the cities or metropolitan areas.

As it can be seen in figure 1, the concept of “food” is treated in an integrative way that binds to various policies concerning:

- Environmental pollution and ecological development failure;
- Health problems created by excessive processing of foods and increasing the consumption of sugar (obesity, diabetes, etc.);
- Loss in food quality (organoleptic properties);
- Decrease in farmer’s and rancher’s revenues due to the subordinate position of primary producers in the value chains.

Quick enumeration of these factors demonstrate that the food sector’s issues focuses on its urban dimension of consumption even though most of them are still linked to the development of rural production.

The emerging of new food geography (Renting, Wiskerke, 2010) develops from theoretical and practical findings along three main axes (as illustrated in Figure 1):

- Shortening the food value chain or promoting alternative food networks (the civil society – market axis)

- Adapting the public food procurement approach (the market – state axis) which requires and active role from the government at different administrative levels.

- Emphasizing the role of urban environment in food production and distribution (the state - civil society axis). This only proves the growing importance of lower levels administration in implementing similar policies.

All the initiatives mentioned previously, fall in line with the efforts made by specialists, in recent years, both in theory and in practice, to implement the new paradigm of agricultural development.

The premises of a sustainable agriculture imply the following:

- Funding research activities
- Providing services and grants to increase production which has a direct effect on: economic growth, social development (to some normal standards for rural communities), environmental quality (which implies a quality management in the area).

The efforts made by specialist are accompanied through the creation of an institutional and legal framework, intended to work as a catalyst for economic growth, in general, but also to develop new innovative farming systems that relies on the mobilization of entrepreneurs in all related agricultural areas.

Actual needs of agricultural entrepreneurship mainly refer to:

- Implementing innovative projects, usually facilitated by co-financing schemes provided by the government for participation in International and European projects on a larger scale;
- Solving technological problems through enhanced cooperation with academia and research institutions;
- Providing access to specific equipment by allowing favorable loans through special bank programs, granted by the European Investment Bank, World Bank, etc.;
- Participation in training programs, for management activities but also to improve the technical skills.

We can summarize that a new paradigm for sustainable agriculture aims at (as can be seen in Fig. 2. Sustainable agro-food systems – Main components):

- Encouraging the development of farming and ranching small enterprises for own consumption, as a feasible option for food safety, faster adaptation to climate change and biodiversity loss;
- Rebalancing investments in agricultural research, identifying viable solutions for agricultural development;
- Exploitation of traditional forms of knowledge, based on farmers practice along with small producers;

- Development of a sustainable agro-food system

### **TDI CROSS-SECTORAL NETWORKS & AGRICULTURE DEVELOPMENT**

The knowledge based economy has gained priority on the EU agenda becoming an important component among R&D Objectives. Ideas coming from practitioners and scientists, sometimes divergent, on sustainable agro-food systems are found in the operating principles of various networks as well as in policies and research programs dedicated to agriculture, such as the Framework Program 7 (FP7) on Food, Agriculture, Fisheries and Biotechnology (FAFB)

In a particular way, each rival vision highlights the need for collective data collection systems to link producers with users, and to serve the programs/projects developed by public research funding priorities.

In recent years, European decision makers were preoccupied with economic development in South East Europe, as well as farming traditions in this area and this led us to focus on the possibility of identifying good practices in promoting sustainable agro-food systems in this area.

Based on statistical data provided by European databases, we proceeded to an initial identification of the size of economic activity recorded in agriculture, as shown in the table 1.

We first started gathering information provided by the European Cluster Observatory concerning existing clusters, considering the number of employees, and thus we managed to get a picture of the enterprises which are related to the activities of food processing as can be observed in Fig. 3.

In the context of European programs to promote knowledge triangle (Higher Education - Business - Research) there are several Romanian institutions involved in promoting a collaborative working environment. Given the theme of this paper, we will only refer (to supplement the information described so far) to projects dedicated to the promotion of networks of innovative collaboration in agriculture - cluster - attended, as a European partner, from the Institute for Economic Forecasting (IPE), Romanian Academy (authors of the article being directly involved in team management and execution respectively).

These projects referred to specific collaboration problems arising in the value chains within the Southeast European space, turning them later in best practices for the economy of other regions. Briefly, we will present significant results, on the topic of cooperation to support sustainable agriculture, obtained in Adriatic - Danubian Clustering (ADC) Project and Smarter Cluster Policies for South East Europe (ClusterPoliSEE)

Project, both from the South-East Europe Program 2007-2013, the latter project is said to be by the European Commission as one of the flagship projects in the EU Danube Region Strategy.

Per literature review, a widely-accepted model, called “triple helix”, tells us about the possibility to bring together different stakeholders, in a specific region or field of activity, all under one management team. This type of network is also called “cluster”. The stakeholders are usually represented by:

- enterprises – which represents the economic side of the cluster, also this will be the critical core;
- universities and research centers or institutions – which represent the technical innovative solutions providers, also the skilled labor providers, all for the benefit of the enterprises as members of the cluster;
- local and regional public authorities, administrative representatives – working as facilitators or as a connection to the government.

In Romania, our experience showed us that the usual pattern of triple helix doesn't really work for the 3 natural partners, mainly because of the lack of cooperation. This comes from lack of trust and not being used to working together with other enterprises. Thus, there was a need to adapt the model by transforming it into a Quadruple Helix model, with a fourth actor represented by catalyst organizations – usually consultancy companies specialized in the transfer of technology and innovation field or centers for transfer of technology (Coșniță, D., Guth. M., 2010).

Within the above-mentioned projects, IPE acted as a research institution in the economy field, with extensive expertise in: Research Data Service Facilities, Economic Forecasting, Foresight studies, Analysis of value chain; Beyond its main activity it also acted as a catalyst during the initial phase where it identified potential clusters, in several areas, agriculture included, both in Romania but also in the South-East Europe space.

The quantitative analysis was supplemented by qualitative analysis, starting with the interpretation of economic questionnaires which were sent to economic stakeholders. The questionnaires were focused around the specific details of the intensity of the cooperation between enterprises and their partnership undertakings. The most significant result was the possibility of cluster mapping, in agriculture area, as shown in Figure 4. For the time, in economy practice as in literature, we introduced the term “transnational cluster”.

After the ADC Project, IPE managed to be involved in another project, the ClusterPoliSEE Project, which came as a natural continuation helping to extend the collaboration among relevant stakeholders (SMEs, Regional development agencies, universities, etc). Within this project, we

aimed in improving cluster`s activities bringing them further in a network of clusters, all in the agriculture and related fields (food cluster, agricultural machinery, food packaging, etc) (see Fig. 5).

Romanian entrepreneurs followed the same trends in the South-Eastern Europe space, in general, economic clustering (Păuna, 2013) and in agriculture particularly. Thus, we present below the list of Romanian clusters from agriculture, which contributes to the improvement of the local development but also creating preconditions for implementing innovative systems in agriculture

1. Agro Transylvania Cluster Cluj (Silver Label)
2. Ind Agro Pol Bucuresti (Silver Label)
3. Agro food Regional Cluster Covasna (Bronze Label)
4. Agropro Oltenia Cluster (Bronze Label)
5. Cluster International agro-food bronz  
[www.mrco.ro](http://www.mrco.ro)
6. Ind Agro Vest Arad (Bronze Label)
7. Agro-food Tara Barsei Brasov
8. Aliment Transilvania Cluster Alba Iulia
9. Agro Cluster Tinutul Neamtului Piatra Neamt
10. Bio Danubius Cluster Tulcea
11. Gusturi Transilvane Cluster Cluj

#### AGROFOOD SYSTEMS - COOPERATION OPPORTUNITIES

Besides the meta networks, one can also observe other forms of cooperation in order to contribute to the promotion of sustainable agro-food systems, all facilitated within different Programs:

- a) Juncker Program – which provides funding for: Agro-food value creation chains, improving Business model SMEs in agro-food, exchange of best practices with EU clusters in agro-food etc
- b) Eco-innovation support through clusters in agro-food -Horizon 2020 Pillar II Industrial leadership
- c) EIT Food – Knowledge and innovation Communities (KIC) - Food4Future -Sustainable Supply Chain from Resources to Consumers

The EIT - European Institute of Technology and Innovation - is an integral part of the EU's Framework Program for Research and Innovation – Horizon 2020. The Food branch is a new pan-European partnership, that is bringing together leading businesses, universities and research organizations. Its mission is to boost innovation, growth and job creation and put Europe at the center of a global revolution in food (<https://eit.europa.eu/eit-community/eit-food>).

EIT Food is a recent consortium of 50 partners from 13 countries that has formed five Co-location Centers across Europe:

- Leuven – CLC West (Belgium, France, Switzerland)
- London – CLC North-West (UK, Ireland, Iceland)
- Madrid – CLC South (Spain, Italy, Israel)
- Munich – CLC Central (Germany, The Netherlands)
- Warsaw – CLC North-East (Poland, Finland).

The involvement of stakeholders in agriculture and related fields, to create food products, will contribute to the promotion of agro-food systems, which in turn, will allow to reach specific long term objectives, to improve the development of the entire society. Among these objectives, we can count:

- Food safety, through coordination and implementation of strategies, at national or regional level
- promotion of cross-border value chains in concert with public decision-makers, agricultural enterprises as well as farmers' and private associations
- Increasing economic understanding among farmers, government, and private sector towards improved efficiency and sustainability of agricultural production.

## CONCLUSION

In conclusion, we can state that the multidisciplinary approach, at national and regional level, is the key for a systemic vision and sustainable development of agro-food systems.

Reviewing major issues related to Sustainable agro-food systems, we observe the following concerns:

- a) food and livestock safety;
- b) food policies;
- c) organic food;
- d) work environment for farmers;
- e) involvement degree of regional agencies;
- f) intersectoral cooperation;
- g) research dedicated to the development of sustainable agriculture.

In subsequent research work, we will attempt to go further into these issues, building on current results.

## REFERENCES

- [1] Carmen Beatrice Păuna, (2013), Perspective ale dezvoltării clusterelor din România în context european, (Perspectives of Romania's clusters development in the European context), Bucuresti, Editura Expert
- [2] Guth M., Cosnita D., (2010), Clusters and Potential Clusters in Romania – A mapping Exercise -, GTZ Report
- [3] Levidow, Birch, Papaioannou, (2012), ‘‘Divergent Paradigms of European Agro-Food Innovation - The Knowledge-Based Bio-Economy (KBBE)’’ as an R&D Agenda
- [4] Marsden, T.K. (2003) The Condition of Rural Sustainability. Assen, Royal Van Gorcum
- [5] Renting, H., Marsden, T.K. and J. Banks, (2003), Understanding alternative food networks: exploring the role of short food supply chains in rural development. *Environment and Planning*, 35, 393–411
- [6] Renting H., Wiskerke H., (2010), New Emerging Roles for Public Institutions and Civil Society in the Promotion of Sustainable Local Agro-Food Systems, Conference Paper · June 2010
- [7] Scrinis, G., Lynos, K., (2007), The emerging nano-corporate paradigm: nanotechnology and the transformation of nature, food and agri-food systems, *International Journal of Sociology of Agriculture and Food* 15 (2), 22-44
- [8] Sonnino, R. and T.K. Marsden, (2006), Beyond the divide: rethinking relationships between alternative and conventional food networks in Europe, *Journal of Economic Geography*, 6, 181–199
- [9] Van der Ploeg, J.D., Renting, H., Brunori, G., Knickel, K., Mannion, J. and T. Marsden, et al, (2000), Rural development: from practices and policies towards theory, *Sociologia Ruralis*, 40, 391-408
- [10] Watts, D.C.H., B. Ilbery and D. Maye, (2005), Making reconnections in agro-food geography: alternative systems of food provision, *Progress in Human Geography* 29, 22–40
- [11] [www.adcproject.eu](http://www.adcproject.eu)
- [12] [http://www.clusterpolisees3.eu/ClusterpoliSEE Portal/](http://www.clusterpolisees3.eu/ClusterpoliSEEPortal/)
- [13] <http://www.clusterobservatory.eu/>
- [14] <https://eit.europa.eu/eit-community/eit-food>

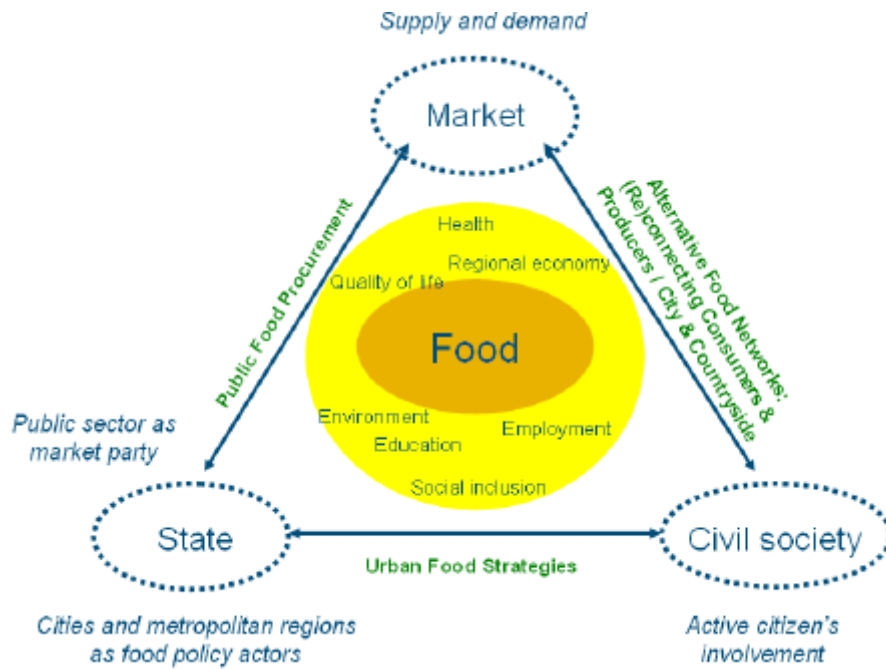
## ANNEXES

Table 1.  
 Cluster Observatory's Agrofood Clusters in SEE; representation by number of enterprises (2011)

Number of Enterprises Country	Sector Agricultural products	Farming and animal husbandry	Processed food	Grand Total
Austria	1383	126	4663	6172
Bulgaria	1508	8775	5983	16266
Croatia	953	2877	2897	6727
Italy	9497	79	38275	47851
<b>Romania</b>	<b>1138</b>	<b>60</b>	<b>10007</b>	<b>11205</b>
Serbia	1732	2002	12899	16633
Slovenia	644	556	1419	2619
Slovakia	133	25	1035	1193
Ukraine	1050	1288	946	3284
<b>Grand Total</b>	<b>18038</b>	<b>15788</b>	<b>78124</b>	<b>111950</b>

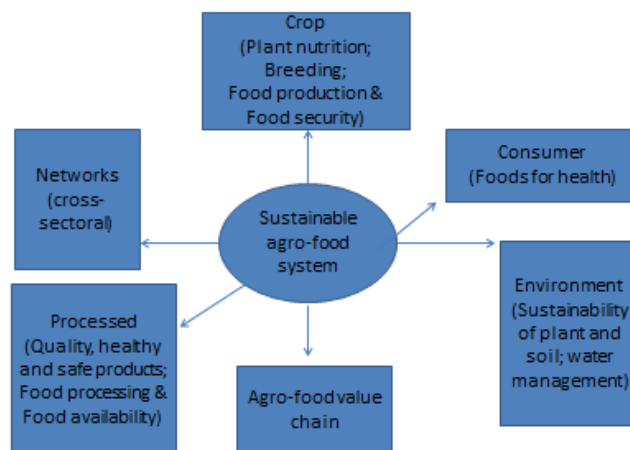
Source: own selection based on European Cluster Observatory Data

Fig. 1 Modern local governance & Territorial integrative governance of the agricultural products



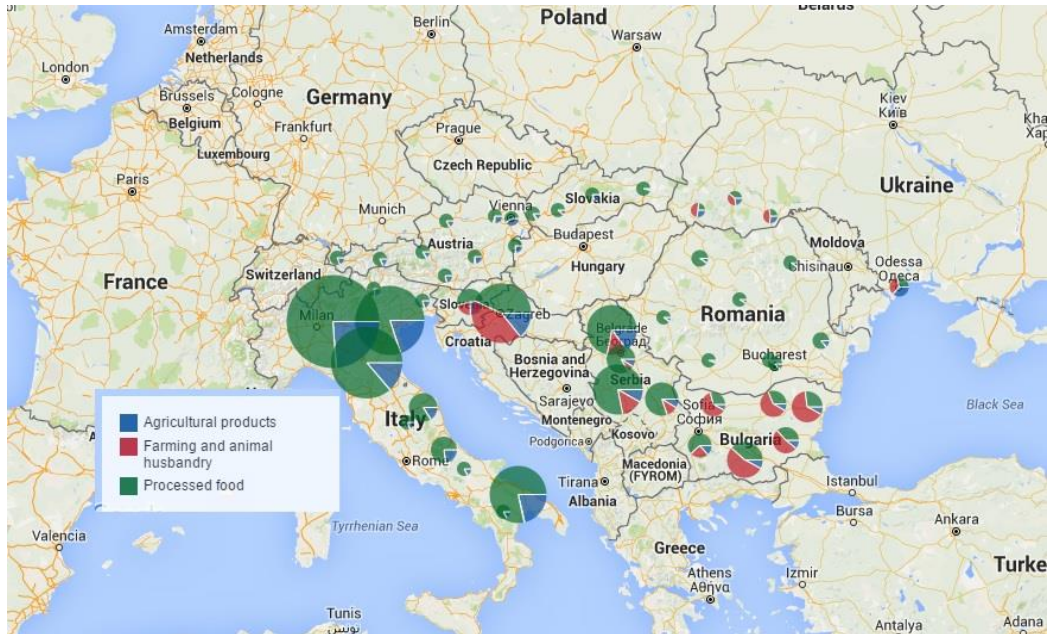
Source: Renting H., Wiskerke H., 2010, *New Emerging Roles for Public Institutions and Civil Society in the Promotion of Sustainable Local Agro-Food Systems*, Conference Paper · June 2010, pg. 1906

Fig. 2. Sustainable agro-food systems – Main components



Source: adapted by the author from Levidow, Birch, Papaioannou, 2012, “*Divergent Paradigms of European Agro-Food Innovation - The Knowledge-Based Bio-Economy (KBBE)*” as an R&D Agenda

Fig. 3. Cluster Observatory's Agrofood Clusters in SEE (2011)



Source: own selection based on European Cluster Observatory Data

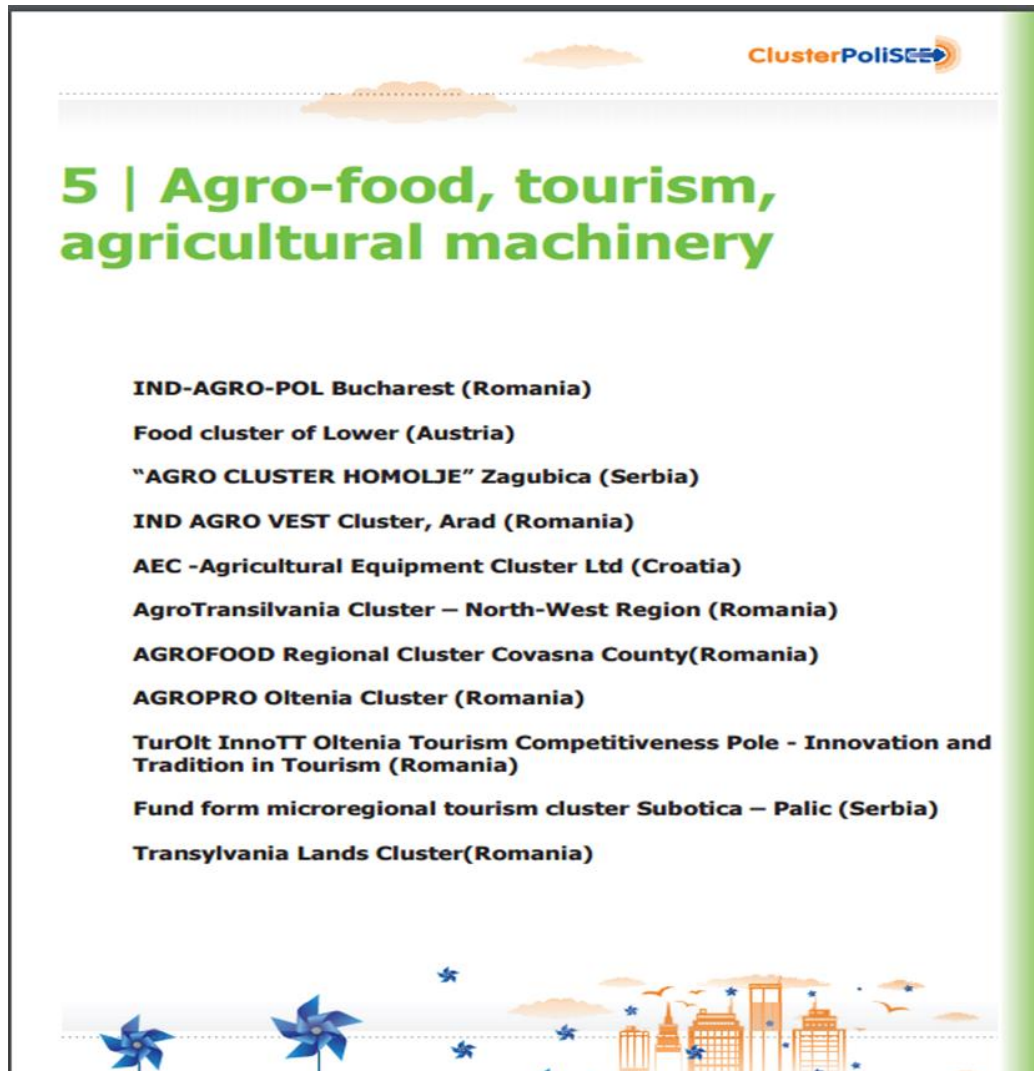
Fig. 4. Agro-food Transnational Cluster in South East Europe



Source: IPE & Territorial Cooperation – South East Europe Programme 2007 -2013;  
Adriatic Danubian Clustering –ADC Project



Fig. 5. Agriculture Meta Network in South East Europe



Source: IPE & Territorial Cooperation – South East Europe Programme 2007 -2013; ClusterPoliSEE Project