INTEGRAREA PREOCUPĂRILOR PRIVIND FURNIZAREA HRANEI IN POLITICILE URBANE ÎN CONTEXTUL SCHMBARILOR IN UTILIZAREA TERENURILOR

PN-III-P1-1.1-PD-2019-0588

Evaluarea potentialului actual și viitor al orașelor din România de producere a hranei

Raport științific și tehnic

Etapa de execuție nr. 1 / 2020

Echipa de lucru:

Director proiect: CS Dr. Simona R. Grădinaru

Mentor: Prof. Univ. dr. Ioan-Cristian Iojă

2020

INTEGRATING FOOD PROVISION IN URBAN POLICIES IN THE CONTEXT OF LAND USE TRANSFORMATION AND DISPLACEMENT

PN-III-P1-1.1-PD-2019-0588

Evaluation of the current integration of food security in urban policies at European and national level

Scientific and technical report

Stage no. 1 / 2020

Project team:

Proiect director: CS Dr. Simona R. Grădinaru

Mentor: Prof. univ. dr. Ioan-Cristian Iojă

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Summary

Introduction

Urban expansion, agricultural land loss and abandonment of agricultural activities are currently the major **land use transformations** affecting Europe (Hatna and Bakker 2011). Between 2000 and 2018, 70% of all land converted to artificial surfaces was arable or permanent crops (EEA 2019a). Agricultural land loss at the expense of built-up land is expected to continue in the future, at a conversion rate of 77.000 hectares annually (Barbosa et al. 2017). Furthermore, by 2030 more than 20 million hectares of agricultural land in the European Union (11% of available agricultural land) will be under high risk of abandonment (Perpiña Castillo et al. 2018). To address these issues, the European Union has defined the objective to stop the process of land take by 2050. The most important reason for the growing interest in agricultural land protection are the concerns over the **depletion of food providing(Hasegawa et al. 2019, EEA 2019b)**. Moreover, in the context of ongoing climate changes and desertification, (IPCC 2019)signals that protecting land resources is imperative.

The **central hypothesis of the *FoodPLand*** project is that (1) public authorities are mandated to propose and implement policies which integrate food security on the urban agenda. For selecting the best integration strategies, a good understanding of both (2) local land use transformations and (3) amplitude of land use displacement is needed. Such assessments would allow to (4) determine the capacity for food provision of urban regions, findings which serve for designing tailored urban planning strategies.

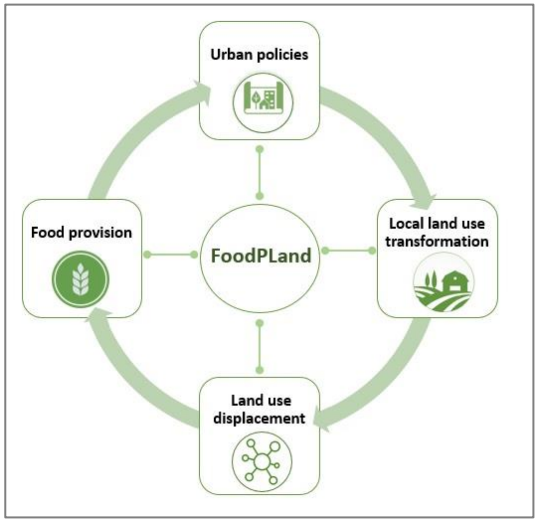

Figure 1. The four interconnected dimensions of the FoodPLand project

These four **interlinked dimensions** (Figure 1) are the foundation for the **specific objectives** of the project:

O1. Evaluate the current integration of food security in urban policies at European and national level;

O2. Assess the direct and indirect land transformations induced by urban expansion in Romania.

O3. Evaluate the amplitude of land use displacement in Romania,

O4. Estimate current and future capacity of Romanian urban areas for food provision.

For the year 2020, the FoodPland project involved one stage (o etapă) over the course of three months (1st of October – 31st of December) covering Objective 1 of the project. This stage included four activities:

1. Selection of European and Romanian policy documents potentially addressing food security,
2. Document pre-processing for text mining,
3. Systematic information extraction and pattern analysis,
4. Classification of the main approaches in planning for food security.

The objectives for stage 2020 have been 100% fulfilled. This report includes a presentation of the main results obtained during the Stage 1 – 2020.

Activity 1. Selection of planning and policy documents relevant for food security

A first stage in the process of planning and policy documents selection was the establishing of planning domains relevant for food security. Following the works by Barthel and Isendahl (2013), Coles and Costa (2018), Seto and Ramankutty (2016) and Grădinaru et al. (2020), as well as the publications by (EEA 2019a), we focused on the following domains: agriculture and rural development, climate change, natural risk management, socio-economic development, sustainability, territorial planning, biodiversity.

In terms of documents types, we focused on the following:

a) European level: strategies, regulations and a treaty. It included for example, The Form to Fark Strategy, the Biodiversity Strategy 2030 and the European Climate Law.
b) National level: strategies and programmes. Examples include the National strategy for sustainable development and the Strategy on climate change and economic development based on low carbon emissions.
c) County: sustainable development strategies, development plans, territorial development plans, plans for risk management and disaster prevention, economic development strategies, spatial development strategies, Agenda 21 plans. For example, we included the Plans for Territorial Development of a Prahova County, Strategy for socio-economic development of Iasi county.
d) Local: sustainable development strategies, economic development strategies, Agenda 21 plans, integrated development plans, mobility plans, energy efficiency plans, action plans for climate and energy. For example, we included the Local plans for Sustainable development of Galati city, Development strategy of Tulcea city.

Data collection was conducted by downloading the documents from the websites of the ministries of agriculture and environment, county councils, municipalities and the EUR-Lex[1] (website of EU law). In total, we downloaded approximately 500 documents.

A coding system was developed to keep track of all the downloaded documents. Each document had a unique ID containing information regarding the document type (e.g. STRA – for strategies, PLAN – for plans), the year when it was adopted (e.g. 2010, 2017), the administrative unit (the first for letters of the city, such as CONS for Constanta or MURF for Murfatlari), the county (e.g. CT of Constanta, TL for Tulcea). Documents au European and national level had the prefix EU and NAT. All the data was recorded in Excel files along with information on the download date and the access link.

ID	Judet	Tip document	Domeniu	Din anul	cod unic	Nume document	Real
1	NT-Neamt	STRATEGIE	DEZV - Dezvoltare	2017	NT_STRA_DEZV_2017_1	Strategie de dezvoltare a judetului Neamt - perioada de programare 2014 - 2020	nu es
2	NT-Neamt	STRATEGIE	DEZV - Dezvoltare	2014	NT_STRA_DEZV_2014_2	Strategie de dezvoltare a judetului Neamt - perioada de programare 2014 - 2020	nu es
3	AB-Alba	PLAN	AMEN - Amenajare	2009	AB_PLAN_AMEN_2009_3	Plan de amenajare a teritoriului judetean Alba	SC Pr
4	AB-Alba	STRATEGIE	DEZV - Dezvoltare	2014	AB_STRA_DEZV_2014_4	Strategie de dezvoltare a judetului Alba- perioada de programare 2014 - 2020	parte
5	AB-Alba	STRATEGIE	DEZV - Dezvoltare	2007	AB_STRA_DEZV_2007_5	Strategie de dezvoltare a judetului Alba- perioada de programare 2007 - 2013	Fu n
6	AB-Alba	STRATEGIE	ECON - Economie si Inves	2018	AB_STRA_ECON_2018_6	STRATEGIA DE PROMOVARE A JUDEȚULUI ALBA CA DESTINAȚIE PENTRU INVESTIT	Comp
7	AB-Alba	STRATEGIE	AGRI - Argicultura/dezvo	2007	AB_STRA_AGRI_2007_7	Strategia de dezvoltare rurala a judetului Alba 2007 - 2013	CJ Al
8	AB-Alba	PLAN	RISC - Riscuri	2011	AB_PLAN_RISC_2011_8	Planul de analiza si acoperire a riscurilor – judetul Alba 2011	CORI

Figure 2. Example of the database at county level

Activity 2. Pre-processing of selected documents for application of text mining techniques

Considering the large amounts of information, traditional document content analysis methods will be too time and resources consuming to be applied. Thus, the documents analysis was conducted using **text mining.** Text mining is the process of structuring large amounts of text by detecting patterns in the use of certain words and by identifying the way they group in topics. It is conducted in two stages: first stage involves the preparation of the documents for analysis (i.e. format data as necessary, cleanse the text of unnecessary information), while the second stage is represented by information extraction and pattern analysis.

Several actions were performed to prepare the documents for analysis. First, all documents were converted to pdf format and all the scanned pages (e.g. approval decisions) and documents were removed. Documents which were downloaded in the form of several files were merged into one larger file to facilitate analysis. After this first stage, the final database contained 476 documents.

[1] https://eur-lex.europa.eu/homepage.html

Table 1. Number of documents which formed the final database used for analysis

Planning level	Sample
European	13
National	9
County	101
Local	353
Total	**476**

Activity 3. Systematic extraction of data from planning documents

The aim of this activity was to provide an overview of the current stage of food security integration in urban policy documents. Research included an evaluation of both European and Romanian planning documents. This comparative assessment will provide important insights which will be used in Objective 4 of the FoodPLand project, that is to determine which will be the best approach for assuring food security in Romanian cities.

Text mining was conducted on a series of keywords representing agricultural land uses, crop types, environmental threats to agricultural sector, as well as social and economic aspects of agriculture, following approaches in topic modelling (Cooper et al. 2020). Examples of keywords are provided in the Table below. Keywords were listed in both Romanian and English. Text mining was conducted in R software by using the following packages: *TM* (Feinerer and Hornik 2018) , pdftools (Ooms 2020).

Table 2. Aspects of food security and example of keywords to capture them

Aspect of food security	Examples of keyword	Stemmed keyword
Agricultural land uses	arabil livadă	arabil livad, livez
Crop types	cereale pomicultură	cereal pomicult
Key resources	sol acvatic	sol acvat
Management aspects	ameliorativ erbicide	ameliorat erbicid
Environmental threats	secetă salinizare	secet saliniz
Social aspects	hrană foamete	hrana foamet
Economic aspects	alimentar subzistenă plați pentru agricultură	aliment subzist plați pentru agricultură

Findings on the frequency of the keywords at county level showed that most planning documents discuss aspects of land uses, resources and economy of agriculture. Surprisingly there are few preoccupations for management activities, considering that the selected planning documents should discuss such aspects. Similarly, food security threats, as well as social and economic aspects of agriculture are also poorly discussed.

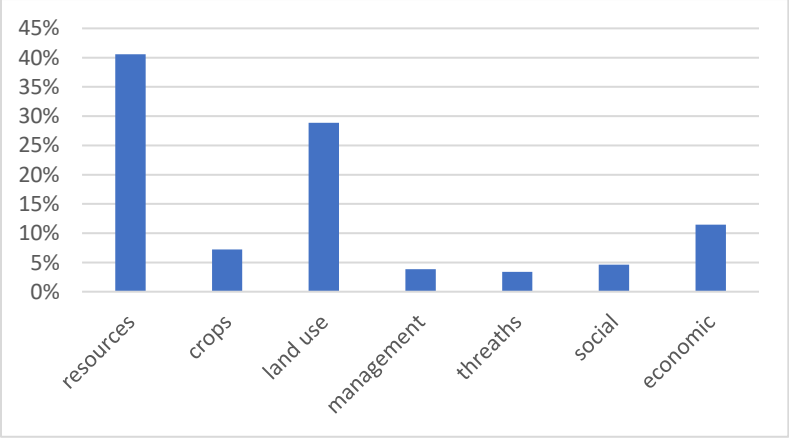

Figure 3. Aspects of food security mentioned in county level planning documents

Planning documents in the domains of sustainable development, territorial planning and risk management are the ones where food security aspects are mainly discussed. Surprisingly, planning documents referring to agriculture and rural development mentioned food security aspects very few times.

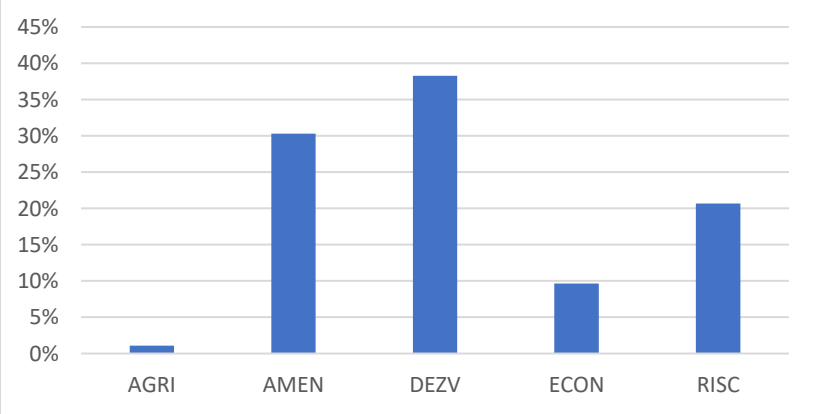

Figure 4. Frequency of food security keywords in county planning documents of various domains

Activity 4. Classification of the main planning approaches

Based on the analysis conducted on both types of planning documents and aspects of food security mentioned:

a) Increased preoccupation for descriptive aspects of food security such as *crop types* and *land uses*.
b) Few preoccupations for *threats* to food security, and economic aspects.
c) Aspects of food security are mainly discussed in *sustainable development strategies*.
d) Planning documents on *agriculture* discuss very few aspects of few security.

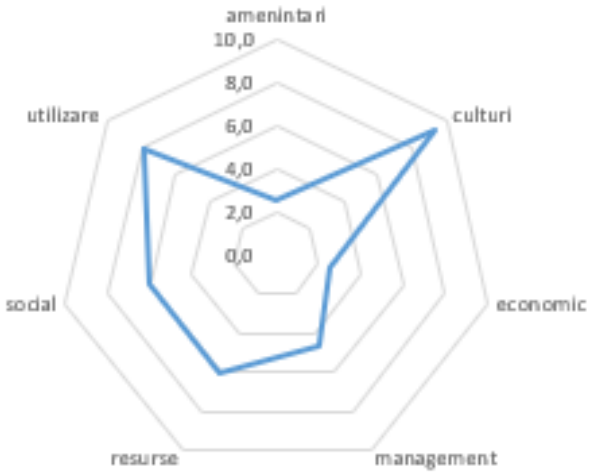

Figure 5. Approaches in discussing food security aspects at county level

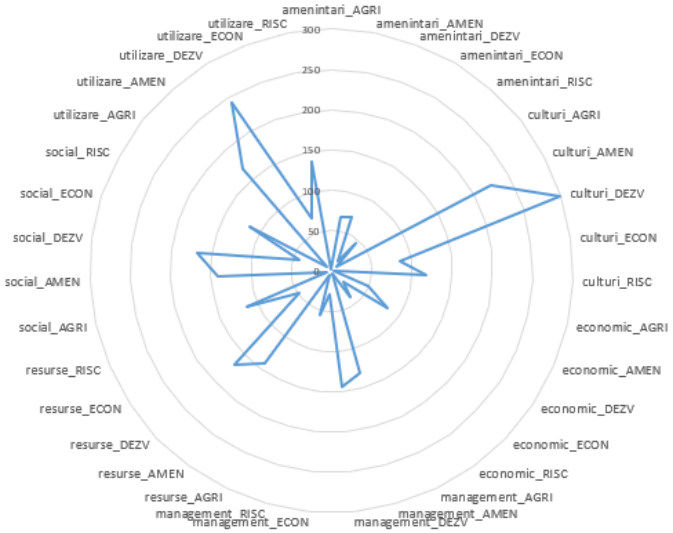

Figure 6. Frequency of food security by aspect discussed and policy document at county level

Words with the highest number of mentions were *agricol, agrictultra, apa, sol, hidro,* and *alimentar* with more than 2000 times being mentioned each. Few planning documents mention *polenization* among resources (N=3). In terms of land processes significantly affecting food security, *land abandonment* is also few times mentioned (N=12).

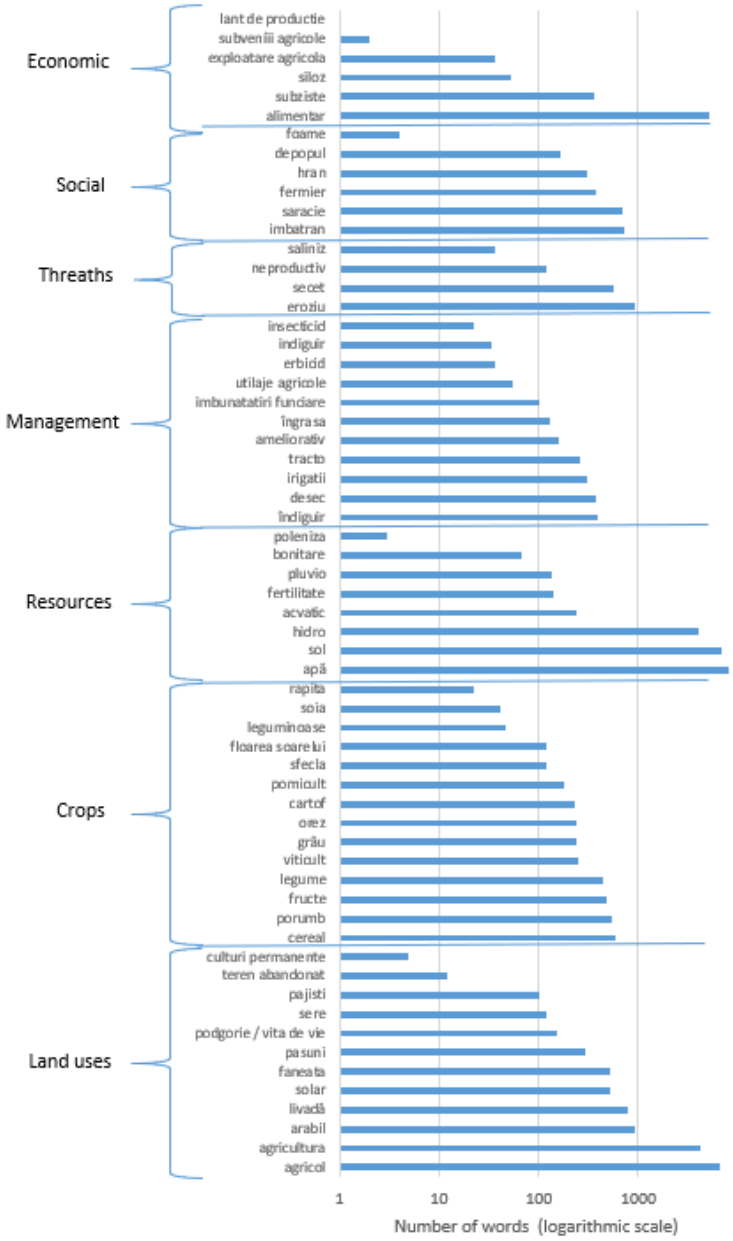

Figure 7. Food security aspects mentioned in policy documents at county level

Conclusions

An overview of the best policy approaches to include agriculture on the urban agenda has not been conducted systematically. Such an analysis would require processing and analysis of large amounts of policy documents, activity which is time and resource consuming. The FoodPlLand project aimed at filling this gap. Finding showed that planning and policy documents include preoccupations for food security. Strategic planning approaches, such as sustainable development strategies, have so far been the main policy documents for addressing food aspects. However, there is still a large focus on descriptive aspects, such as land uses and type of cultivated crops, in contrast to more pressing aspects such as threats and management approaches.

Results

All the activities planned for Stage 1 – 2020 have been been 100% fulfilled.

Indicator	Planned	Done	Fulfilled
	Stage 1-2020	**Stage 1-2020**	
Technical and scientific report	1	1	100%
Conference participation	1	2	100%
Web page	yes	yes https://ccmesi.ro/?page_id=1690	100%
Database	1	1	100%

Scientific article in preparation

- Grădinaru S.R., Ioja Cristian, Niță Răzvan, Vânău Gabriel - Feeding the cities: what metropolitan abandoned agricultural lands could bring to the table.

Conferences

- Grădinaru S.R., Iojă C.I., Gabriel Ovidiu Vanau, Niță M., *Integration of food security issues into county planning agendas*, International Geographic Seminar Dimitrie Cantemir, 24 octombrie 2020, Iași (online conference).
- Paraschiv M.G., Iojă C.I., Grădinaru S.R., Evaluarea impactului potențial al abandonului terenurilor asupra securității alimentare a orașelor din România utilizând imagini satelitare și tehnici de machine learning, Present Environment and Sustainable Development, 21 November, Iasi (online conference).

Database

- 1 database on planning and policy documents relevant for food security at four planning levels: European, national, county and local.

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Seto, K. C. & N. Ramankutty (2016) Hidden linkages between urbanization and food systems. *Science,* 352**,** 943-945.