

ADDRESSING CHALLENGES AND ENHANCING PROSPERITY: THE OREN PROJECT'S INNOVATIVE APPROACH TO RURAL ENTREPRENEURIAL EDUCATION

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Abstract

The prosperity of rural areas within the European Union (EU) is widely acknowledged, yet these regions grapple with challenges in an increasingly urbanized world. Despite diverse socio-economic performances, natural characteristics, and cultural heritage, many rural areas face intrinsic fragility in social, economic, and environmental aspects, resulting in common challenges and missed opportunities. This paper presents findings from the OREN project (E+ 2021-1-IT02-KA220-ADU-000033510), an Erasmus+ initiative designed to address these challenges. The project aims to bridge the rural-urban gap by developing an interactive learning platform offering sustainable business models, simulation tools, and managerial courses tailored to agricultural entrepreneurs. The platform seeks to equip participants with advanced managerial and business skills. The OREN partnership adopts a multi-echelon approach. It begins by collecting and analyzing best rural business practices, gathering data and key success/failure factors from diverse rural areas. Additionally, a repository of System Dynamics simulation models is developed, serving as both an interactive learning environment for rural entrepreneurs to test scenarios and a learning material to develop their own models. The culmination of the OREN project is a free course dedicated to rural entrepreneurs, leveraging insights from successful business models. The potential impact of OREN extends to rural entrepreneurs, enhancing their ability to analyze successful business scenarios and understand best practices. Moreover, the project serves as a non-traditional vocational training model, combining advanced simulation techniques with traditional business management lectures, offering a holistic and experiential learning approach beyond traditional education styles.

Keywords: rural entrepreneurship, vocational training, Erasmus project.

1 INTRODUCTION

The role of rurality in the prosperity of the European Union (EU) is widely acknowledged; however, rural areas face challenges in an increasingly urbanizing world. Despite the diversity in socio-economic performances, natural characteristics, and cultural heritage, many rural areas exhibit intrinsic fragility in social, economic, and environmental aspects, leading to common challenges and underutilization of opportunities.

Common structural vulnerabilities, including distance, lack of critical mass, and low population density, are exacerbated by the recession etc. Furthermore, the recession, the COVID pandemic in combination with the consequences from the ongoing climate changed have put an extra burden to rural entrepreneurs, who are facing increasing complexity and deep uncertainty in their business, exacerbating existing vulnerabilities. Maximizing the opportunities depends on a constellation of factors coming together. If one or two of the elements cannot be achieved, there could be continued stagnation or decline instead of transformation. In other words, no matter how much progress is made towards tapping rural opportunities, if rural vulnerabilities are not addressed, they could render any form of progress shallow. These discussions underscore the importance of exploiting future opportunities in a manner that addresses rural vulnerabilities and current state of the art calls for new strategies and models of rural development to be found and applied so to turn lagging rural areas into resilient rural communities. Thus, education emerges as a pivotal factor for enhancing rural business efficiency, yet few programs specifically target rural entrepreneurs' needs.

The objective of the current paper is to report on the OREN project (E+ 2021-1-IT02-KA220-ADU-000033510), an Erasmus+ initiative, aims to bridge this gap by developing an interactive learning platform offering sustainable rural business models, simulation tools, and managerial courses tailored to agricultural entrepreneurs. The platform seeks to equip participants with advanced managerial and business skills.

To achieve the objective the OREN partnership relies on a multi-echelon approach: Firstly, best rural, business practices have been collected and analyzed. This activity provided the opportunity to collect data and important factors of success and failure from various areas of rurality in different countries. In addition, a repository of System Dynamics simulation models has been developed and collected that serves a dual purpose: (1) to develop interactive learning environment where rural entrepreneurs can test different scenarios about their actual business and (2) the model platform and the models themselves can act as learning material where rural entrepreneurs can learn how to develop their own simulation models and test various policy options for their businesses in a consequence-free environment.

The culmination of the OREN project is the development of a course targeted and dedicated to rural entrepreneurs. The course will be available for free, use the insights that were revealed from successful business models and offer courses on the following subjects: (1) European and national rural policy frameworks (2) Business Management Skills (3) Sustainable Innovation Skills (4) Modeling and Simulation skills and (5) Communication and Soft Skills.

2 METHODOLOGY

To achieve the objective of the OREN project, a multi-echelon approach was utilized. Firstly, scientific databases were searched that focused on simulation rural models and especially using the methodology of System Dynamics. Secondly, the project partners collected successful case studies that from their respective countries with the purpose of creating a knowledge repository that could assist rural entrepreneurs to investigate how other people developed successful rural business and moreover the case studies provided insights that would help better clarify the content of the courses that would be developed in the context of the project. Thirdly, a repository of simulation models focused on rural entrepreneurship was developed that could be used by the rural entrepreneurs either as teaching tools in order to learn how to develop their own simulation business models or they could be directly used to test different scenarios focused on their specific needs. Finally, based on the insights from all previous activities 5 modules/courses were developed that covered the areas: (1) European and national rural policy frameworks (2) Business Management Skills (3) Sustainable Innovation Skills (4) Modeling and Simulation skills and (5) Communication and Soft Skills.

The overall OREN methodology is depicted in the flowchart below:

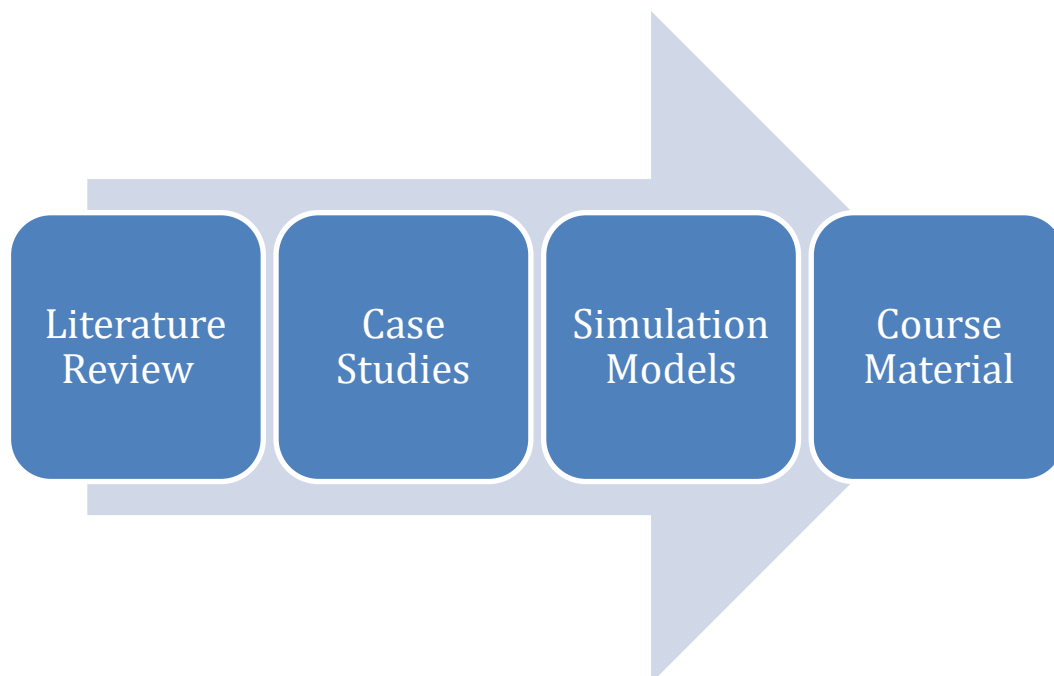


Figure 1. The OREN approach

3 RESULTS

The following paragraphs summarize the main results from the various levels that were described in the previous section.

3.1 Results from the literature review

System Dynamics has a long tradition in modelling agricultural systems. This is not unexpected since the food value chain is characterized by deep uncertainty; in addition, climate change and an ascending world population means that agricultural systems will need to adapt in order to provide enough food for the world population and a viable income for the agricultural entrepreneurs.

The Food and Agriculture Organization estimates that in the next 3 decades, food production will have to increase by almost 50% to address the needs of the population [1]. Such an increase in production will have multiple consequences: increased GHG emissions, degradation of the land etc. [2]. Hence, agricultural entrepreneurs will have to proceed with a business model that would be easily adapted to the changes of the climate and at the same time would not contribute to natural degradation without resulting in loss of income for the entrepreneurs themselves. Such type of agriculture has been named Climate-smart agriculture (CSA) [3] and system dynamics has been used to model its intricacies and complexities. For example, Jagustović et al. [2] developed a model with the purpose of investigating the effects of a climate-smart village in northern Ghana. Chung [4] developed a System Dynamics model to illustrate the structure and decision-making processes along the rice value chain in Malaysia.

On the issue of rural tourism, Randelli et al. [5] view rural tourism as a major force of diversification in rural income, especially for small, family farms. In addition, it can add to the cultural exchange between urban and rural areas, enhance the traditional values of rural life [6] and equally important, this diversification can counteract emigration from rural areas.

Similar to the other application, System Dynamics has been extensively used in the context of energy. For example Teufel et al. [7] performed a literature review on the use of System Dynamics in the electricity markets simulation.

In conclusion, the analysis of the literature offered several lessons and revealed important gaps. Some of the most important are: There are a lot of papers that focus on the production process of agricultural products, but not on how different business models could affect the development/income of rural entrepreneurs. During the last few years, researchers have started focusing on the diversification in rural entrepreneurship by studying, for example, the effects of agro-tourism, however, the same has not been observed with the interplay of energy-agriculture. Finally, there has not been a lot of research focusing on the technological aspect of rural entrepreneurship or the skill acquisition of rural entrepreneurs and their impacts.

3.2 Results from the case studies

Apart from the literature review, case studies on successful business agricultural models were collected by the project partners. Examples of such case studies are depicted on Table 1 below.

Table 1. Examples of case studies

Country	Name	Sector	Aim	Challenges	Good practices
Bulgaria	Biofish Trading Ltd	Agriculture	1) Connect producers to customers 2) Small food supply chain 3) Maximum benefit from waste	N/A	1) Preservation and teaching of know-how to next generation 2) Pay attention to the behavior of animals 3) Digitization
Belgium	Linked.Farm	Agriculture	Sales and distribution digital platform for local Farm2Fork products	1) Limited access to public tenders 2) Every farmer can invest only money they have	1) Shortening the food chain 2) Diverse stakeholders-resilience
Germany	Innovative Landwirtschaft Reber	Agriculture	Family-run farm	Lack of funds and economic incentives	Regenerative farming and carbon farming

Greece	ThesGi	Agriculture	Promote the cooperation among its members to achieve economic, social and cultural development	1) Increasing cost of energy and supplies 2) Scaling up is difficult 3) Limited access to R&D 4) Political and financial context	Organizational structure, focus on local community, involvement in all aspects of agricultural production
Spain	Bodegas José Pariente	Agriculture	Wine production family company	1) Local and National Competition 2) International markets and competitions	1) The investments in R&D and innovation 2) integrated corporate social responsibility 3) quality 4) commitment to preserve the environment

For the analysis of the case studies, the various sentences from each case study were converted to text that could be analysed with the Python Programming language¹. More specifically, the data were cleaned, processed and all stopwords were removed. In addition, Principal Components Analysis was performed to transform the text into numerical values that could be easily manipulated. The new data were used in a K-Means clustering algorithm with 4 clusters to investigate which rural enterprises share similar characteristics. Finally, for each cluster, a function was created that revealed the most used/common words that appear in it.

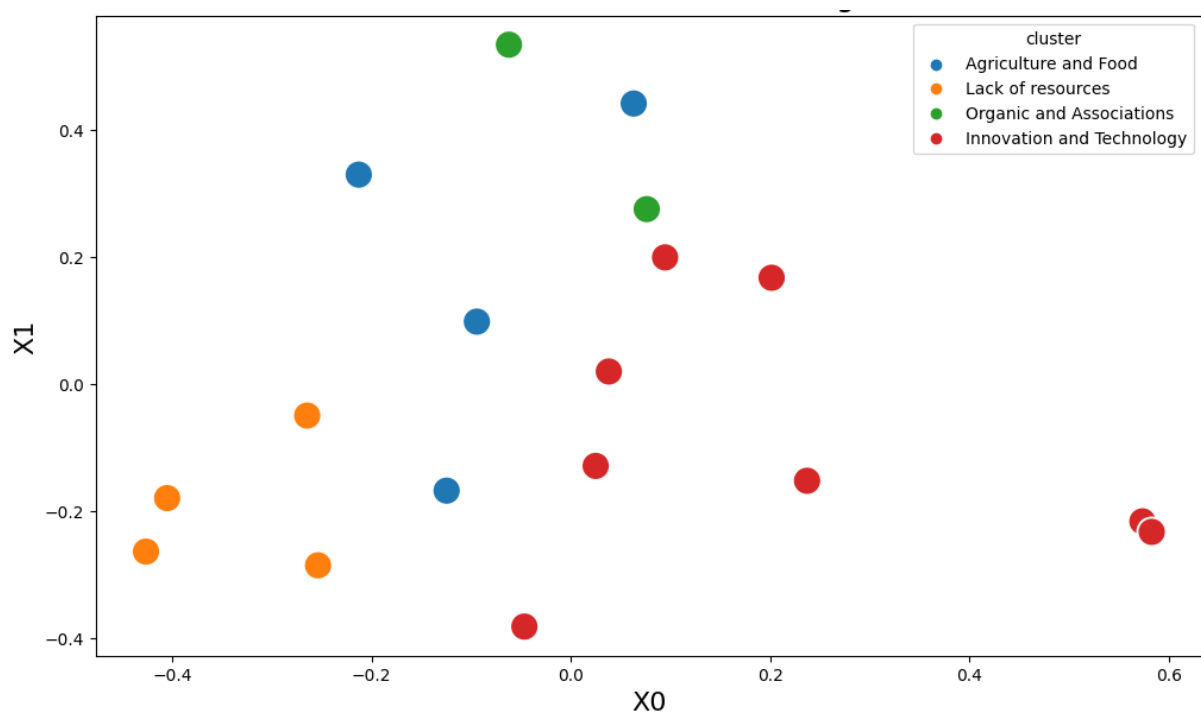


Figure 2. Clustering of the case studies and important keywords for each cluster

Consequently, the analysis illustrated several interesting facts:

- 1 Mediterranean countries with a long tradition in rural entrepreneurship pay attention to innovation and technology as means to boost development
- 2 Countries from the north focus on the organic aspect of agriculture and how the whole food chain is affected. In addition, associations of rural enterprises take center stage in these countries
- 3 Finally, the lack of resources as an obstacle for rural enterprises appears in both the north and southern countries and irrespective of their level of economic development.

¹ <https://www.python.org>

3.3 Results from the development of the simulation models

Finally, for the development of the simulation models, a group of experts was gathered in Rome on July of 2023 and their expertise and knowledge was used to develop a Causal Loop Diagram of an agricultural business model and a subsequent quantitative model. The Causal Loop Diagram is depicted on Figure 3 below.

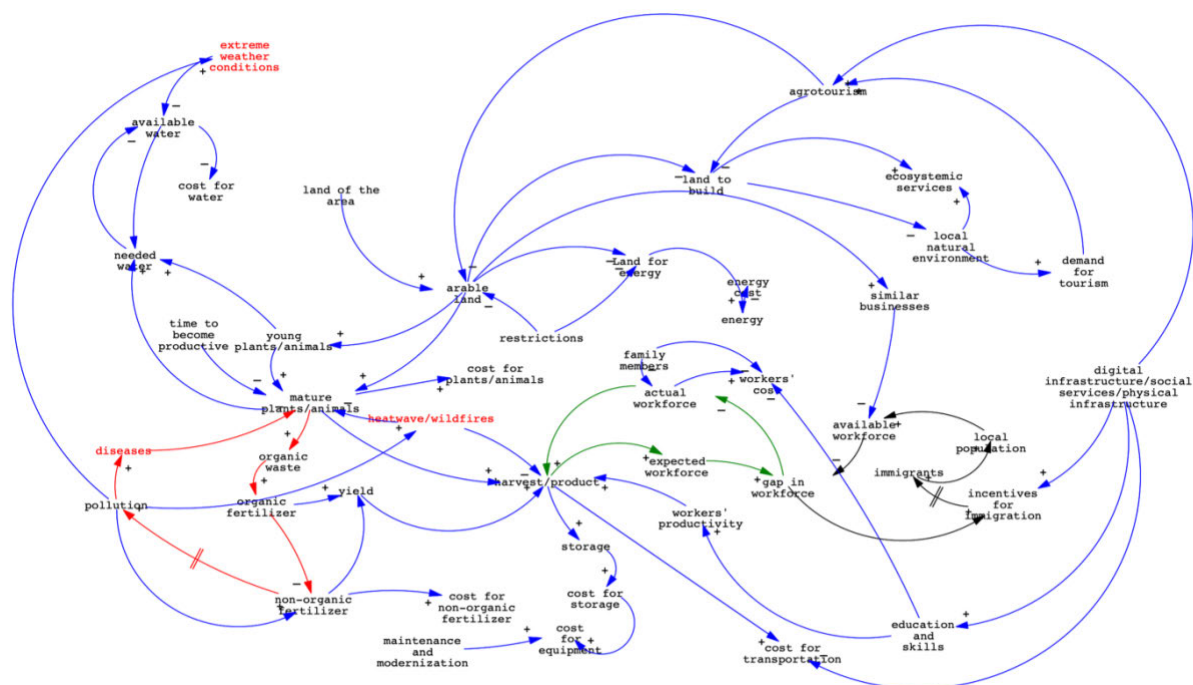


Figure 3. Causal Loop Diagram of the simulation model.

The focus is on the operational aspect of rural entrepreneurship and the interaction among agriculture, energy and agro-tourism. However, the GMB session provided the opportunity to include deeper details. For example, pollution is explicitly introduced in the model along with its potential effects (variables in red) and the interactions with the main variables. Moreover, the focus in this CLD is on costs and not income in general. In addition, there is a very detailed sub-structure related to workforce and how it could affect agriculture. Finally, the experts paid attention to the notion of infrastructure of the area under study (either digital, social and/or physical) and how this infrastructure could increase productivity, reduce costs and act as incentive for immigration in the area that could increase the available workforce.

3.4 Course Material

All the results and insights that were revealed from the previous activities culminated in the design and development of a course consisting of 5 modules with the purpose of increasing the managerial and entrepreneurial skills of rural entrepreneurs. The modules along with some details are depicted on table 2 below.

Table 2. The OREN Educational Material

Modules	Classes
MODULE 1: European and national rural policies framework	European Framework, National Legislative Background
MODULE 2: Business management Skills	Business model, Collection of rural business models, How to fund a business model
MODULE 3: Sustainable innovation skills	Sustainability for innovation in rural context, Open Innovation Framework, Sustainable innovative solutions in rural areas
MODULE 4: Modeling and Simulation	What is Systems Thinking, System Dynamics and Simulation, How to use the OREN platform, Modeling and simulation through System Dynamics
MODULE 5: Communication and Soft skills	Communication of a business model, Communication of a sustainable practice, Systems thinking, Networking skills, Equality and inclusion in a business

The registration for the OREN course is now open and anyone interested could do so in:
<https://www.oren-project.eu/course/>

4 CONCLUSIONS

The objective of the current paper is to report on the OREN project (E+ 2021-1-IT02-KA220-ADU-000033510), an Erasmus+ initiative, aims to bridge this gap by developing an interactive learning platform offering sustainable rural business models, simulation tools, and managerial courses tailored to agricultural entrepreneurs. The platform seeks to equip participants with advanced managerial and business skills.

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The culmination of the project is the development of a course that would assist rural entrepreneurs to develop and/or improve their managerial skills and hence make their enterprises more successful and sustainable.

The potential impact of the OREN project extends to two categories. Firstly, for rural entrepreneurs, acquiring these skills is expected to enhance their expertise in analyzing successful business scenarios and understanding potential good practices. Secondly, the OREN educational program serves as an illustration of non-traditional vocational training, combining advanced modeling and simulation techniques with traditional business management lectures, providing a holistic and experiential learning approach beyond the limits of traditional education styles.

ACKNOWLEDGEMENTS

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