

SOCIO-ECONOMIC IMPACT ASSESSMENT IN RURAL DEVELOPMENT– CASE STUDY CAMELINA PRODUCTION IN ROMANIA

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Abstract

This paper aims to present a solution for the fragmented agricultural land in the rural area of Romania, involving farmers and local authorities from different villages. The need to set up local associations for everybody's benefit is further explored, based on the outcome of the EC Project ITAKA, of which Romanian organisations were partners. A framework is proposed, SEIA (Socio-Economic Impact Assessment), to investigate the social aspects and economic impacts associated with Camelina feedstock production. The selected feedstock is linked to the aviation biofuel production, thus a strong argument for economic diversity and prosperity. An understanding of local culture was essential when recording community perception relating to Camelina investment and production in a particular area from Cluj County. The SEIA used in Romania was structured primarily around development and economic factors: land ownership and use, levels of agricultural mechanisation, the size of the available workforce, existing infrastructure and level of taxes raised. Social aspects linked to quality of life, incorporated into the 'people development' category, included increased employment and lower social costs, better education and health, a cleaner environment. A different feedstock of economic interest may be considered, but the main objective is to find proper solutions for a fertile, but uncultivated land in Romania's rural area.

Key words: socio-economic impact, rural development, Camelina feedstock, community.

INTRODUCTION

Over the past 50 years, the amount of land given over to farming has declined due to the introduction into Europe of cheap food products (Millstone E., 1999).

Considerable areas of land have also been lost to food production due to contamination caused by industrial processes (Schierhorn et al., 2013).

These changes have been driven by and taken place, a long side growing patterns of migration into urban areas (Pasakarnis G. and Maliene V., 2010), which have led to increasing levels of poverty and social deprivation in many rural communities.

The production of biofuels, which are seen as a way of addressing the challenge of energy security through the growing and processing of crops (such as Camelina), has the potential to revitalised rural communities, creating employment, supporting social and economic growth and developing new skills.

The sustainability of biofuels from agricultural sources is however, a critical issue that needs to be assessed before large scale production can be considered, and given that this industry could compete with food production through land use and water supplies and, therefore threaten food security.

The aim of this paper is to challenge some of the outputs of the SEIA (Socio-Economic Impact Assessment) framework presented in the ITAKA (Initiative Towards sustAinable Kerosene for Aviation) project (www.itaka-project.eu).

The area considered is the Sanmartin Commune from Cluj County, an area comprising 8 villages.

The main objectives are to identify the relevant social and economic aspects, to assess the potential development impacts associated to Camelina production and propose a SEA framework which can be later adapted to other Romanian regions, such as Targu-Mures and Satu-Mare.

MATERIALS AND METHODS

As a methodological tool, SEIA is designed to assist communities in making decisions that promote long-term sustainability, including economic prosperity and social development, which leads to an increased quality of life. There are no methods that are universally applicable, and these must be developed on the local level (Eijck et al., 2013). A reliable sustainability assessment methodology requires location-specific and operational data. Existing SEIA Guidelines (MacDonald, 2006) need to be followed (or proper guidelines developed) prior to start the SEIA process. The approach used in this paper was to explore the socio-economic impact of Camelina production via a case study scenario that was representative of small rural villages, based on experience with Camelina cultivation in 2014 & 2015, as part of ITAKA project, involving a *baseline survey*, which was conducted to gather the necessary data, using a *mix methodology* (quantitative and qualitative) for identifying and quantifying the SEIA pillars.

The SEIA Framework was designed based on selected socio-economic values and available data for the selected case-study. Subsequent phases required the application of this Framework to Sanmartin area, to identify existing challenges related to Camelina production in terms of opportunities, benefits and risks that could be later mitigated. Experience on rural challenges from Targu-Mures and Satu-Mare gave a better perspective to this particular context.

RESULTS AND DISCUSSIONS

Scenario development

The selected case study was Sanmartin Commune from Cluj County: altitude 320 m, population 1384 (2012 census). Out of 8 villages, which are Sanmartin, Diviciorii Mici, Diviciorii Mari, Mahal, Targusor, Samboieni, Cutca and Ceaba, only 3 were involved in this study: Sanmartin, Cutca and Targusor. (<https://www.google.com/maps/@47.0322852,24.086648,1830m/data=!3m1!1e3>)

It is worth to mention, the census of 2002 recorded a population of 1744 inhabitants in the Sanmartin commune. The difference illustrates an evidence of population leaving rural area due to poor economic conditions. Adding this aspect to the ageing population in the villages, it makes the socio-economic aspects of the selected area, a real challenge.

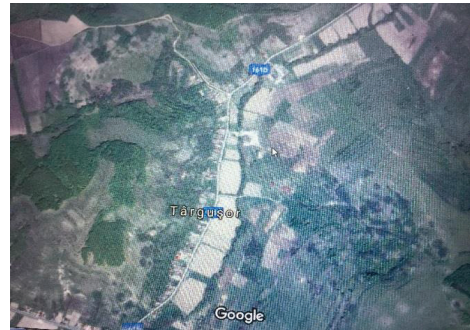


Figure 1. Targusor/Sanmartin: images of fragmented land - via satellite (30 March, 2018)

The trial of Camelina cultivation took place during the autumn of 2014 and summer of 2015. The land involved was only existing agricultural land, using Camelina as a rotation crop. Land-use change was not an issue. The aspect of productivity was not important in this exercise, only the perception of the importance of cultivating a crop with potential for large, economic contracts was considered, based on the potential of Camelina value chain in aviation biofuels production.



Figure 2. Camelina - in Pirloage, Targusor (12 March, 2015)

The stakeholders involved were: land owners (8), farmers (12), work force (9), and local authorities (6). The fragmented land constituted an issue from the beginning, the involvement of cultivated land varying from 0.5 ha to max 7 ha. The study started with a roundtable discussion held at Sanmartin village Hall, to explain the aims and objectives of this study and challenge the knowledge of sustainability, while mentioning *fuel versus food approach*. The initial objectives were shaped based on the interest of the stakeholders involved: better quality of life based on an economic perspective due to the cultivation of a new crop in the region.

The selected SEIA method used in the ITAKA project needed to be adjusted and partly modified to local situation, in order to engage with the main stakeholders. The background information from literature was poor for Sanmartin area, so a semi-structured interview proved the best option to capture the perception of respondent(s) regarding possible interests, advantages or risks associated to Camelina production. The data gathered on existing infrastructure was split into two categories, given the fact that respondents had knowledge of existing infrastructure needs (hard infrastructure), level of education and health services (soft infrastructure).

Thus, the hard infrastructure involved questions related to the existing state of the roads, water supply, sewage system, gas and electricity supply.

The soft infrastructure represented the access to health and education, logistics and communication aspects (telephone, mobile), access to information (library, computers), hospitality in the area etc.

Measuring the perception of social well-being showed the aspects of roads and water supply being a priority in developing the local infrastructure, but lack of proper health facility was also mentioned.

The questions were formulated around the following pillars:

- Existing local regulations and stakeholders involved: what legislation needs to be known and who are the stakeholders involved in SEIA process: landowners, farmers, workforce, NGO, local authority etc.

- Local ownership and involvement: who is the land owner: private, association, state; how large is the community; population size: how large is the selected trial.
- Taxation policy at local, regional, national and EU level: tax on land at different level; any kind of subsidies
- Selected villages and consideration (infrastructure, income, work-force, employability, education, health).
- Assessing and Quantifying Socio-Economic Impact at local level; represent benefits, *profits* due to Camelina production versus *risks* vulnerability.

The information gathered needs to be refined from time to time and the link between pillars may change, according to the assessment outcome.

This type of social change is more problematic to quantify than changes in the economic environment, because the assessment relies on the perceptions of residents about the proposed development. This part of survey was better covered through interview, when participants were asked to make explicit their perceptions and attitudes about the anticipated changes in the social environment when Camelina production will be a reality, not a project.

Data collection

Data acquisition had two approaches: published statistical data and newly collected field data, gathered via a questionnaire and consultation with land owners, farmers, workforce and local authorities, via several interviews.

The SEIA developed for use in Sanmartin area was structured mainly around development and economic factors: land ownership and use, mechanisation, local workforce, development of hard and soft infrastructure, taxes on land and profit due to investments. Social aspects and quality of life are incorporated in 'people development' box, which implies increased employment/lower social costs, better education and health, cleaner environment. 'Rural social cohesion' box, which shows aspects of depopulation and induced growth, illustrate also social aspects related to SEIA.

Following collection of primary and secondary data, a statistical analysis was carried out to

provide an understanding of, and mapping of the positive social and economic impacts and benefits of Camelina cultivation, as well as to identify associated risks that could be later mitigated.

The analysis revealed different impacts depending on type of stakeholders' involved in Camelina feedstock production:

1. impacts upon landowners and farmers;
2. impacts upon workforce;
3. impacts upon local authorities/local communities/NGOs.

Impacts (social, economic and combined) were in some cases perceived and in others, deduced from data analysis.

The positive impacts

The social dimension

The results of the ITAKA study demonstrate that the social benefits of biofuel (i.e. Camelina feedstock) production can be broken down into those relating to an increased employment and standard of living for the local workforce and those that contribute to increased social cohesion and stability for rural communities. The former being of greater significance in Romania and the latter aspect being more important in Spain, where the local workforce comprised a number of different nationalities and some were seasonal workers. The application of these results in Sanmartin case-study proved *the economic aspects being more important than the social ones*.

Macroeconomic effects

The use of indigenous resources implies that much of the expenditure on energy provision is retained locally and is re-circulated within the local/regional economy giving rise to the development of secondary industries and associated services. The increased use of biofuels, which exhibits both a broad geographical distribution, and diversity of feedstock, could secure long-run access to energy supplies at relatively constant costs for the foreseeable future. Camelina can be used for transport sector in general, for cosmetics (oil) and as animal feed (Camelina cake). If Camelina is grown on contaminated land, a special assessment needs to be conducted.

In this particular case-study, the use of Camelina oil for cosmetics and pharmaceutical industry proved a better, sustainable solution,

due to predicted small quantities, based on a fragmented land which requires a farmers' association to be set up in the region.

Supply side effects

Supply side effects are likely to differ in kind and will depend upon the development (i.e. especially in Romania), but generally such 'economies of speculation' relate to changes and improvements in local/regional productivity, enhanced competitiveness, as well as any investment in resources to accommodate any inward migration that may result from the development. The insufficient data gathered during this survey did not help a clear conclusion on this aspect.

The negative impacts

According to the results of the ITAKA project applied to this study, and mainly from the perceptions assessed via interviews, the negative impacts of Camelina feedstock production are anticipated to include: an adverse impact upon existing farming activities, biodiversity losses and congestion on local roads and in communities due to increased traffic. However, these views were countered by experts who saw improvements in agricultural output, particularly in Romania. In addition, given that proposals for development of a Camelina value chain need to comply with sustainability criteria detailed in the RSB Principles, these negative aspects are likely to be avoided, diminished or mitigated. Sustainable rural development has a basic rule, which says that an advantageous economic development needs to be based on sustainable principles regarding all natural components: air, water, soil, biodiversity, forests and underground resources. These issues play an important role in community life and are representatives for rural communities, expressing strong conservation values and beliefs. In the Sanmartin case-study, these values were firstly explained, and then debated. The approach to 'conservation villages' and natural resources' was brought to discussion mainly by farmers, incorporating 'clean air & water' as a component of environment.

The Camelina cultivation impacts seem to be felt mostly in the economic areas, related to job creation and employment opportunities, as well as opportunities for local economy

diversification. Furthermore, at each community level, the positive impacts and benefits, on one hand, and the uncertainties on the other, could now be put together (due to SEIA process), for a better understanding of risk mitigation areas.

The expected impact on main population groupings involved:

- **The impact on workforce:** for rural areas, Camelina production has the potential to provide significant (direct and indirect) employment opportunities for local people, both those looking for work and those looking for employment improvement
- **The impact on farmers/landowners** Camelina crop is an attractive feedstock as it does not require significant or costly agricultural input (e.g. fertilizers) and requires low specialisation agricultural machinery. Given the low agricultural mechanization level in Romania, this crop will be attractive not only for big farmers but also for small local agricultural companies and small family-owned businesses.
- **The impact on Local community/Local authorities:** By promoting and helping expand Camelina crop production, the local economy will benefit in terms of new jobs, an increase in local tax collected, economic diversification (as farmers source materials and services locally) and the development of better services, as people have more to spend locally. Local authorities see additional benefits in promoting rural development and reducing urban migration.

An important secondary benefit generated by this feedstock is related to its use on abandoned and contaminated soil. Camelina cultivation may also improve soil quality and productivity as factor of soil remediation, this constituting the second benefit.

Discussion

One important requirement when assessing socio-economic benefits is to find the appropriate balance between the needs and aspirations of different stakeholders (local authorities, farmers and landowners, the local

workforce and NGOs), taking account of their capabilities and incentives, the potential benefits that accrue to each, and the potential risks of investing in Camelina feedstock production.

It is important to reiterate that the SEIA conducted in Romania and Spain as part of the ITAKA project was an initial exercise, the aim being to design a framework and explain how it works. This framework now needs to be refined with additional data and recorded perceptions and comments received from stakeholders involved. The framework proposed for Sanmartin case-study (Fig 3) is a concrete illustration of the ITAKA outcome. The interest and engagement of the selected participants is a confirmation of a proper selection of SEIA pillars. Defining quality of life differs from the illustrated case-studies in ITAKA project, as in the Sanmartin case-study, the hard infrastructure being basic and poor (no water supply or sewage infrastructure in the houses), was evidence based of the need for improved economic conditions before talking about social cohesion.

Engagement of the local workforce is seen to be key to sustaining rural communities, both in terms of their willingness to develop the necessary skills to support Camelina feedstock production, and in terms of their interest in remaining to live and work in these local communities. In this regard, local authorities, farmers and land owners need to work together to support local workforce development programmes.

The relevance of the findings

The findings of the Baseline Survey show a clear interest in promoting Camelina production amongst three groups of stakeholders, local authorities, farmers and landowners, as well as the local workforce.

Stakeholders

- Are primarily concerned about economic security, so job creation is seen as essential and risks associated to Camelina production are almost ignored. This is also reflected in the ITAKA SEIA report which demonstrates that Romanian respondents identified mitigation options for all identified risks.

- Social aspects are perceived mainly through employment opportunities with job creation being suggested as a direct link to improved quality of life.
 - Agricultural land utilisation was of concern, including uncultivated land, however there is recognition of the benefits and opportunities of growing Camelina on larger areas, generated by setting up of local associations.
 - The ageing population, which will translate in lack of local workforce, was seen as a challenge but the opportunities of creating local employment and therefore reducing rural to urban migration of young people was seen as an opportunity.
 - Local authorities welcome Camelina feedstock production, seeing direct benefits in terms of opportunities for improved local infrastructure: roads, water and sewage.
- The potential workforce needed to support Camelina production is generally local and their current income is mainly from agricultural activities.



Figure 3. Proposed SEIA Framework based on the survey results (adapted from Dimitriu, 2016)

Drivers in expanding Camelina production

One important subject that would influence attitudes is an understanding of the benefits and risks of expanding Camelina feedstock production. According to ITAKA project, in both Romania and Spain, *farmers seem to be the main drivers*, as they have the necessary knowledge of the issues and connections to mitigate any production-related risks at local level. In Romania, farmers were interested in working with Local Authorities to nurture and develop local skills, and this proved true in the Sanmartin case study as well. Another reason for engagement by farmers and a willingness to commit the investment is that many are looking to diversify away from their current crops and Camelina is a very promising option. It is noteworthy that Romanian farmers expressed an interest in developing long term contracts, linked to markets for oil, seeds and Camelina cake. Considering the existence of several cattle herds in Sanmartin region, Camelina cake was welcome by the local farmers.

Difficulties and lesson learned

The most challenging part of this study was the collection of socio-economic data, as part of initial survey. Sanmartin stakeholders engaged positively with the study, providing their unpaid time, both out of curiosity and in the hope of securing investment in Camelina feedstock production at a later stage, following completion of the ITAKA project. Although initially there was some reluctance to engage in the project, the example given by those involved in Camelina cultivation, made other farmers and land owners curious about this new feedstock in the area and asked permission to have access to the study, to provide their thoughts and discuss the results. Thus, although the involvement in the survey was small as number (34 participants), it remains representative to the population of Sanmartin commune and it can be stated that the stakeholders engagement was above the expectations.

To some extent, data may be considered skewed towards those with a vested interest (farmers/landowners) and therefore prepared to give up their valuable time. This is explained quite simply by their desire to seek out

opportunities for local economic diversification.

Data collection presented some obstacles, as even where data were available, they were often incomplete, or included information (from different sources – e.g. census and national statistics) that were contradictory or confusing. Due to existing different data sources to gather primary data, additional information from Local authorities, was of a great help.

Lesson learned

This study has revealed the following lessons for application in future research (similar with the ITAKA project ones):

- All appropriate survey methods need to be initially considered, with the specific methodology chosen for final use selected after consultation with key stakeholders.
- The availability of economic, agricultural, labour force and other structural and census data needs to be confirmed prior to the finalisation of the survey methodology.
- An understanding of local conditions and local culture is critical not just to ensure engagement from stakeholders, but also to design an appropriate SEIA framework and maximise opportunities for securing the appropriate data to provide meaningful outputs.
- The benefits of spending more time with community leaders to take on board their views regarding issues of local significance such as priorities, existing projects, the role of, and need for economic diversification or social cohesion.
- The need to redesign the SEIA framework to take on board lessons learnt during initial questionnaire and survey work.
- There is a need to *proactively engage* with key stakeholder groups, provide the appropriate information and develop an awareness campaign well in advance of the study, to maximise levels of engagement and participation.

The broad SEIA Framework adopted for this task proved to be an effective way of assessing

the potential social and economic impacts of Camelina feedstock production in both countries, but the precise methodology adopted had to be adapted to the particular conditions, culture and data availability at each study location.

CONCLUSIONS

The Sanmartin case-study was an application of the ITAKA project outcome, aiming at motivating farmers to set up associations in order to increase the productivity of a very fertile- but uncultivated and under-cultivated land.

The results indicate existing perceptions of a net positive socio-economic impact, brought by Camelina as a new feedstock.

However, further investigation would be required to fully confirm this, given that this approach to SEIA is in its infancy and, also, considering the scarcity of data collected from this selected case-study.

There is considerable potential to undertake a more comprehensive assessment of the potential economic benefits of extensive Camelina cultivation across Romania, using data on local and national taxation, local economic development, local employment and job creation potential.

The tool developed in this research could be further refined to facilitate an economic study. Additional trials are foreseen for Targu-Mures and Satu Mare regions.

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