

# The Dynamics of the Degree of Investment at the Level of Economic Agents whose Main Activity is Agriculture, Forestry and Fishing in the Context of the Concerns regarding Coastal Development

Kamer-Ainur Aivaz

"Ovidius" University of Constanta, Faculty of Economic Sciences, Romania

[aivaz\\_kamer@yahoo.com](mailto:aivaz_kamer@yahoo.com)

## Abstract

*Maritime spatial planning is one of the most important interventions for protecting the biodiversity of coastal areas against the threat of human activities, the traditional agricultural activities having a considerable impact on the economy of Constanța County. Based on these considerations, the share of a country's agricultural sector is closely linked to the share of its protected areas, even if the trend in the share of agriculture in the general economy is also due to the "natural" evolution of the characteristics of agricultural systems. This study examines the effect of investment development and equity on turnover in the field of Agriculture, Forestry and Fishing in Constanța County. Starting from the premise that investments support the increase in agricultural productivity and favor job creation, the estimated results show that fixed assets and equity positively affect the turnover.*

**Key words:** degree of investment, agriculture forestry and fishing, Constanta County, coastal area, Maritime Spatial Planning (MSP)

**J.E.L. classification:** Q10, Q14, Q56

## 1. Introduction

Coastal areas have always been a fulcrum for trade, where diversified and intensive economic activities take place, therefore being attractive to the human habitat. Moreover, they are also areas of great ecological importance, as some of the most productive habitats are concentrated in this area (Ariel, Feitelson and Marinov, 2021).

Maritime spatial planning aims to integrate the maritime dimension of certain coastal uses or activities, taking into account their impact on the environment, as well as to ultimately allow the development of an integrated vision with strategic objectives (Directive 2014 / 89 / EU). In this context, stakeholder engagement is a key element for MSP (Ehler and Dover, 2009). There are certain studies that bring together experiences and specialized literature on MSP, introducing elements related to food issues, agricultural practices, and ways of managing natural resources (van Ewijk and Ros-Tonen, 2021). There are many cases where the environmental and management policy of agriculture, forestry (Šebesta et al., 2021) and fishing (Psuty, Kulikowski and Szymanek, 2020) are often in conflict.

It is well-known that agriculture has a significant contribution to economic growth and serves as a driving force for the sustainable economic development (Li and Zheng, 2021). However, the Agriculture, Forestry and Fishing sector is unusual in many ways, comprising a wide variety of companies engaged in growing crops, raising animals, timber harvesting and capturing of fish and other animals in a hatchery, farm or in their natural habitat (Chapman and Husberg, 2008).

The development of agriculture generates the transformation of urban, natural areas, wetlands or lands covered by water in agricultural areas, thus producing transformations of the agricultural areas (Petrișor and Petrișor, 2018). Thus, we are witnessing an increase in the pressure on natural resources and global warming with profound implications for the field tackled in this study.

## 2. Theoretical background

The importance of coastal areas in the context of maritime planning is justified by the multitude of their resources, the complexity of ecosystem services and the key role played in the socio-economic development, these areas being subjected to increasing demands and pressures (Petrișor et al., 2020; Nguyen et al., 2020), such as the fact that agricultural land has undergone an extensive transformation for residential and commercial uses, being vulnerable to coastal hazards and other natural disasters (Li, Nadolnyak and Hartarska, 2019).

Recent research (Psuty, Kulikowski and Szymanek, 2020) states that MSP has the role and capacity to create the tools needed to coordinate a variety of functional and territorial spatial activities, especially in order to implement investment projects in a lasting and sustainable way.

Maritime spatial planning (MSP) is one of the most important interventions for protecting the biodiversity of the coastal areas from the threat of human activities, traditional agricultural activities having a considerable impact on the economy of Constanta County. Agriculture has often been defined as a unique sector capable of changing the environment and reorganizing the resources at its disposal. Therefore, not infrequently, local communities have generally perceived protected areas as an obstacle to agricultural and forestry practices necessary for their livelihood (Donia et al., 2017).

This kind of activities have sparked a heated debate in the specialized literature, on the one hand, being those who claim that they hinder socio-economic development and, on the other hand, those who claim that they are able to increase social welfare. Based on these considerations, the share of a country's agricultural sector is closely linked to the surface of the protected areas, even if the trend of the share of agriculture in the general economy is also due to the natural evolution of the characteristics of agricultural systems. Indeed, findings in the literature indicate that the relative share of the agricultural sector tends to decline due to the growth recorded in other emerging sectors, such as industry and services.

However, at the community level, a comprehensive agricultural development alleviates food shortages, contributing to the improvement of agricultural productivity and the increase in incomes (Li and Zheng, 2021), ensuring socio-economic stability and relative autonomy of certain social categories, such as the farmers. Therefore, all these aspects must be taken into account in the development of coastal communities in order to successfully, sustainably and efficiently materialize these induced secondary benefits (Filip, Stan and Vintilă, 2016a).

When discussing agriculture, a thorny issue is the ownership of agricultural land, and it is necessary to take into account several aspects related to this area: the liberalization of the agricultural land market, the financial resources and the inefficient exploitation of fragmented plots, the multitude of uncultivated land. These issues are of crucial importance in the interest to introduce changes in land use, components of global changes, taking into account their negative influence on ecosystem services, biodiversity and human welfare (Petrișor, Sirodoev, and Ianoș, 2020).

Economic activities in the field of Agriculture, Forestry and Fishing are mostly carried out by private organizational entities, but public investment can be a stimulus in generating indirect benefits in terms of healthy sustainable development on the Black Sea coast (Filip, Stan and Vintilă, 2016b).

## 3. Research methodology

The objectives of this research have been to carry out both a dynamic and structural analysis of fixed assets and equity, and the analysis of the correlation between them and the turnover of economic agents operating in the field of Agriculture, Forestry and Fishing in Constanța County in the maritime spatial planning context.

The statistical observation was performed in a comprehensive manner, using the data provided by the Ministry of Public Finance National Agency for Fiscal Administration for the 2010-2019 period. In order to obtain quantitative data, with a generalizing character, allowing us to know what is essential in the manifestation form of the analyzed phenomena, we have resorted to the method of combined statistical grouping by subgroups of activities according to NACE (CAEN) classification, using SPSS software.

The generalization of the values was achieved through absolute, relative, and mean indicators, by measuring their deviations and bringing them to the level of the average indicator. The study of deviations and variations, together with the use of mean and relative values, have a special importance, characterizing the degree of homogeneity of the statistical aggregation in the desired base. The variation indicators also determine the degree and limits of the variation. The correlation analysis has used the coefficient proposed by Pearson, the multiple simple regression being a statistically significant model for the links between the chosen indicators.

#### 4. Findings

The first part of the study conducted a dynamic financial analysis of companies within the category of Agriculture, Forestry and Fishing activities, according to the NACE classification in Constanța County, in the 2010-2019 period. In order to see the size and structure of the investments, the fixed assets and equity reported by the companies in their annual financial statements were analyzed.

The subgroups of activities included in this NACE group are shown in Table 1.

*Table no. 1 Subgroups of activities in the field of Agriculture, Forestry and Fishing*

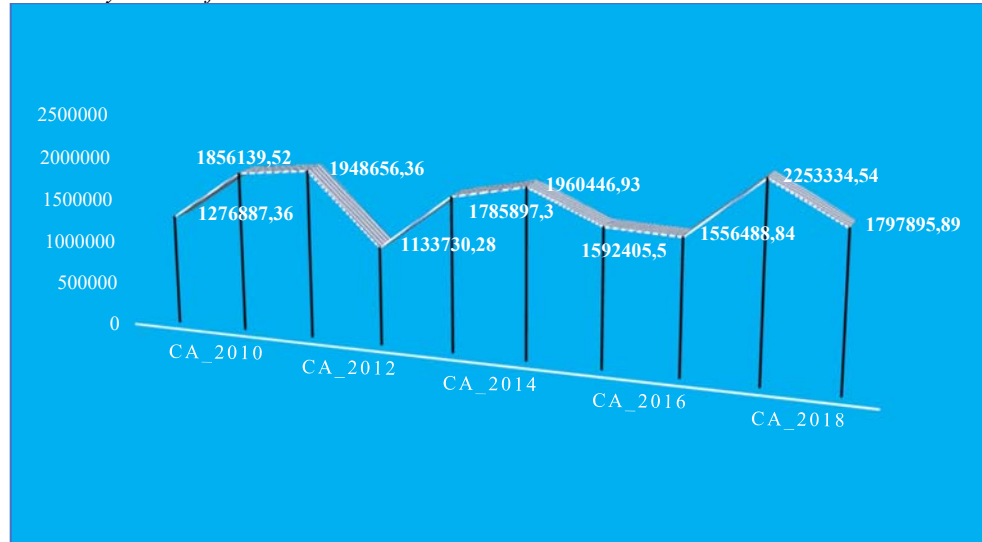
111	Growing of cereals (except rice), leguminous crops and oil seeds
113	Growing of vegetables and melons, roots and tubers
114	Growing of sugar cane
115	Growing of tobacco
119	Growing of other non-perennial plants
121	Growing of grapes
124	Growing of pome fruits and stone fruits
125	Growing of fruit bushes, strawberries, walnuts and other fruit trees
127	Growing of beverage crops
128	Growing of spices, aromatic, drug and pharmaceutical crops
129	Growing of other perennial crops
130	Plant propagation
141	Raising of dairy cattle
142	Raising of other cattle and buffaloes
145	Raising of sheep and goats
146	Raising of swine/pigs
147	Raising of poultry
149	Raising of other animals
150	Mixed farming (growing crops combined with raising animals)
161	Support activities for crop production
162	Support activities for animal production
163	Post-harvest activities
170	Hunting, trapping and related service activities
210	Silviculture and other forestry activities
220	Logging
240	Support services to forestry
311	Marine fishing
312	Freshwater fishing
321	Marine aquaculture
322	Freshwater aquaculture

Seen as a whole, figure 1 indicates that although this sector had a fluctuating evolution, the trend of the CA (turnover) mean level in the analyzed decade was in a slight expansion, from 1,276,887.36 lei in 2010 to 1,797,895.89 in 2019.

As can be seen in Figure 2, on sub-activities, the dynamics is extremely heterogeneous, with support activities for animal production (162) being significantly different in terms of CA from other activities. There is an increased interest of economic agents for animal raising activities, activities related to artificial insemination, for herd and flocks expertise and control services (expertise for issuing breeding authorizations for the breeding males, issuance of individual certificates of origin and productivity, expertise and control of semen), pig castration services, services for studs, shearing of sheep, moving of herds services, activities to support / promote the spread of animal raising,

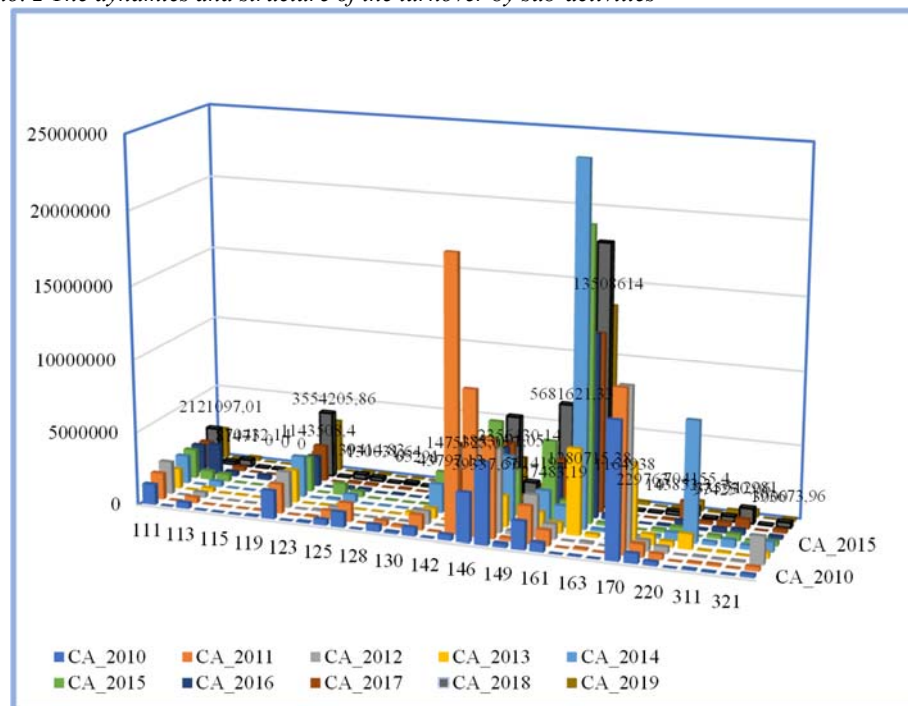
grazing services, sanitation services of coops and shelters, etc. This group of activities is the one that brings high and safe profits, unlike plant crops which still largely depend on the climatic conditions. Moreover, in addition to the internal market, which shows a constant demand for these products, the external market, through exports, was an extremely profitable way of capitalization through its added value contribution.

Figure no. 1 The dynamics of turnover



Source: Author's processing

Figure no. 2 The dynamics and structure of the turnover by sub-activities



Source: Author's processing

Table 2 shows the R-squared values, also known as the coefficient of determination, a statistic frequently used to evaluate the appropriateness of the regression equation model. The results indicate that throughout the analyzed period the chosen independent variables, fixed assets and equity, can predict the variation of the dependent variable, the turnover.

The global analysis of the relationship, for all the regression coefficients as a whole was carried out using the ANOVA test, the results indicating the existence of a linear relationship between the criterion variable, the turnover and the two predictor variables, fixed assets and equity.

Table no. 2 Multiple regression

Year	R	R-square	F	Sig.
2010	0.471	0.222	85.556	<.001
2011	0.519	0.270	117.337	<.001
2012	0.488	0.238	103.739	<.001
2013	0.579	0.335	211.276	<.001
2014	0.582	0.339	170.611	<.001
2015	0.733	0.538	404.655	<.001
2016	0.631	0.399	251.189	<.001
2017	0.580	0.377	201.436	<.001
2018	0.626	0.391	264.634	<.001
2019	0.498	0.248	168.400	<.001

Source: Author's processing

As is well-known, the closer the value of the Pearson correlation coefficient is to 1, in absolute value, the higher the intensity of the linear relationship between the 2 variables. Table 3 shows for each year the intensity of the connection between turnover and fixed assets, respectively between turnover and equity. The dynamics emphasizes the year 2015, marked by large correlations, a year that indicates the companies' interest for business development, this being a year in which they have invested more than in the previous or in the next years.

Table no. 3 Simple correlations

Year	$R_{CA(\text{turnover})/Aimob}$ (fixed assets)	$R_{CA(\text{turnover})/Cpropiu}$ (equity)	N
2010	0.398	0.382	610
2011	0.448	0.484	638
2012	0.422	0.426	668
2013	0.372	0.564	840
2014	0.468	0.576	668
2015	0.640	0.725	699
2016	0.537	0.610	761
2017	0.430	0.561	796
2018	0.478	0.605	826
2019	0.399	0.475	1026

Source: Author's processing

The arguments for the investment differ from company to company. Regarding the specific mechanisms through which they aim to increase agricultural productivity, the investment process can contribute to structural changes in the economy. It has long been theorized, but not confirmed, that advances in agriculture can promote changes in the workforce towards higher productivity sectors that offer a higher real income (McArthur and McCord, 2017). Given the long-term nature of investments, such as those in forestry, with the usually over 25 years' time from planting to harvest, the decisions taken by forest administrators today will shape the future of their business in the coming decades (West et al., 2021).

Within the analyzed echelon, some activities, such as fishing and aquaculture, are less privileged, exerting less influence on MSP (Piwowarczyk et al., 2019).

## 5. Conclusions

The multiple regression analysis conducted was aimed at assessing the ability of fixed assets and equity to predict the turnover. The research has identified a linear relationship between the criterion variable and the predictors (sig <0.001) throughout the analyzed period. The multiple correlation coefficient recorded values between 0.222 and 0.538, approximately 22%, respectively 53.8% of the turnover variance being explained by the simultaneous contribution of the two variables, fixed assets and equity. These results show that companies with a predilection for investment can significantly influence turnover.

The role of the business community in MSP processes is worthy of additional attention (Luhtala et al., 2021), the competent planning authorities being able to include in the elaboration of an integrated vision the category of activities in the field of Agriculture, Forestry and Fishing in Constanța County. This happens because the role of agriculture as a potential threat to terrestrial biodiversity is particularly difficult to assess, as agriculture can have both positive and negative effects on biodiversity, depending on the practices and the spatial configuration used (Hervé, Albert and Bondeau, 2016). Forest management also plays an important role in maintaining the ecosystem processes, some of them further stressing the importance of applying appropriate treatments through sustainable forest management (Šebesta et al., 2021).

Although MSP is considered a process, one of its defined objectives is to seek compromise, as in the case of fishing, which often presents more risks than opportunities (Piwowarczyk et al., 2019).

Given the huge regional potential for economic and industrial exploitation, which is generated by the specificity of the coastal area (Filip, Stan and Vintilă, 2016b), for the development of an integrated vision, the maritime spatial planning process should also take into account the effect of investment development of economic agents in the field of Agriculture, Forestry and Fishing for a sustainable development in the Black Sea coastal area.

## 6. Acknowledgements

This work has been supported by the European Commission through the European Maritime and Fisheries Fund, Cross-border Maritime Spatial Planning for Black Sea – Bulgaria and Romania (MARSPLAN-BS-II), EASME/EMFF/2018/1.2.1.5/01/SI2.806725.

## 7. References

- Ariel, A., Feitelson, E., Marinov, U., 2021. Economic and environmental explanations for the scale and scope of coastal management around the Mediterranean. *Ocean & Coastal Management*, Volume 209, 105639, [online]. Available at: <https://doi.org/10.1016/j.ocecoaman.2021.105639>
- Chapman, L.J., Husberg, B., 2008. Agriculture, Forestry, and Fishing Sector. *Journal of Safety Research*, 39(2), pp. 171-173, [online]. Available at: <https://doi.org/10.1016/j.jsr.2008.02.008>
- Directive 2014 / 89 / EU of the European Parliament and of the Council of 23 July 2014 establishing a framework for maritime spatial planning, [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0089>
- Donia, E., Mineo, A.M., Mascali, F., Sgroi, F., 2017. Economic development and agriculture: Managing protected areas and safeguarding the environment. *Ecological Engineering*, Volume 103, Part A, pp. 198-206, [online]. Available at: <https://doi.org/10.1016/j.ecoleng.2017.04.010>
- Ehler, C.N., Douvère, F., 2009. *Marine Spatial Planning: a Step-by-step Approach Toward Ecosystem-based Management*, Paris: UNESCO, [online]. Available at: <http://msp.ioc-unesco.org/msp-guides/>
- Filip, C., Stan, M.I., Vintilă, D.F. 2016a. Considerations regarding the expected benefit of rehabilitation works related to Romanian coastal zone of the Black Sea on regional sustainable development. 16th International Multidisciplinary Scientific GeoConference SGEM 2016, SGEM Vienna GREEN Extended Scientific Sessions, *SGEM 2016 Conference Proceedings*, Book 6 Vol. 3, pp. 523-530, DOI: 10.5593/SGEM2016/HB63/S10.067.
- Filip, C., Stan, M.I., Vintilă, D.F., 2016b. Multi-criteria analysis of urban development in the Romanian Black Sea coastal zone. 16th International Multidisciplinary Scientific GeoConference SGEM 2016, SGEM Vienna GREEN Extended Scientific Sessions, *SGEM 2016 Conference Proceedings*, Book 6 Vol. 3, pp. 569-576, DOI: 10.5593/SGEM2016/HB63/S10.073.

- Hervé, M., Albert, C.H., Bondeau, A., 2016. On the importance of taking into account agricultural practices when defining conservation priorities for regional planning. *Journal for Nature Conservation*, Volume 33, pp. 76-84, [online]. Available at: <https://doi.org/10.1016/j.jnc.2016.08.001>
- Li, Y., Zheng, Y., 2021. Regional agricultural industry economic development based on embedded system and Internet of Things. *Microprocessors and Microsystems*, Volume 82, 103852, [online]. Available at: <https://doi.org/10.1016/j.micpro.2021.103852>
- Li, S., Nadolnyak, D., Hartarska, V., 2019. Agricultural land conversion: Impacts of economic and natural risk factors in a coastal area. *Land Use Policy*, Volume 80, pp. 380-390, [online]. Available at: <https://doi.org/10.1016/j.landusepol.2018.10.016>
- Luhtala, H., Erkkilä-Välimäki, A., Eliassen, S.Q., Tolvanen, H., 2021. Business sector involvement in maritime spatial planning – Experiences from the Baltic Sea region. *Marine Policy*, Volume 123, 104301, <https://doi.org/10.1016/j.marpol.2020.104301>.
- McArthur, J.W., McCord, G.C., 2017. Fertilizing growth: Agricultural inputs and their effects in economic development. *Journal of Development Economics*, Volume 127, pp. 133-152, [online]. Available at: <https://doi.org/10.1016/j.jdeveco.2017.02.007>
- Nguyen, H. D., Hamma, W., Stan, M.I., Tran, V.T., Aștefănoaiei, R., Bui, Q.T., Vintilă, D.F., Pham, Q.T., Lixândroi, C., Truong, Q.H., Țenea, D.D., Ianoș I., 2020. Impacts of urbanization and tourism on the erosion and accretion of European, Asian and African coastal areas and possible solutions. *Urbanism Architecture Constructions*, 11(2), pp. 123-156.
- Petrișor, A.-I., Petrișor, L.E., 2018. Transitional Dynamics Based Trend Analysis of Land Cover and Use Changes in Romania during 1990-2012. *PESD*, 12(2), 215-231, DOI 10.2478/pesd-2018-0042.
- Petrișor, A.-I., Sirodoev, I., Ianoș, I., 2020. Trends in the National and Regional Transitional Dynamics of Land Cover and Use Changes in Romania. *Remote Sensing*, 12(2), 230, [online]. Available at: <https://doi.org/10.3390/rs12020230>
- Petrișor, A.-I., Hamma, W., Nguyen, H.D., Randazzo, G., Muzirafuti, A., Stan, M.-I., Tran, V.T., Aștefănoaiei, R., Bui, Q.-T., Vintilă, D.-F., Truong, Q.H., Lixândroi, C., Țenea, D.-D., Sirodoev, I. and Ianoș, I., 2020. Degradation of Coastlines under the Pressure of Urbanization and Tourism: Evidence on the Change of Land Systems from Europe, Asia and Africa. *Land*, 9(8), 275, [online]. Available at: <http://dx.doi.org/10.3390/land9080275>
- Piwowarczyk, J., Matczak, M., Rakowski, M., Zaucha, J., 2019. Challenges for integration of the Polish fishing sector into marine spatial planning (MSP): do fishers and planners tell the same story?. *Ocean & Coastal Management*, Volume 181, 104917, [online]. Available at: <https://doi.org/10.1016/j.ocecoaman.2019.104917>
- Psuty, I., Kulikowski, T., Szymanek, L., 2020. Integrating small-scale fisheries into Polish maritime spatial planning. *Marine Policy*, Volume 120, 104116, [online]. Available at: <https://doi.org/10.1016/j.marpol.2020.104116>
- Šebesta, J., Rogers, P.C., Maděra, P., Koutecký, T., Dufour, S., Řepka, R., 2021. Long-term effects of mechanical site preparation on understorey plant communities in lowland floodplain forests. *Forest Ecology and Management*, Volume 480, 118651, [online]. Available at: <https://doi.org/10.1016/j.foreco.2020.118651>
- van Ewijk, E., Ros-Tonen, M.A.F., 2021. The fruits of knowledge co-creation in agriculture and food-related multi-stakeholder platforms in sub-Saharan Africa – A systematic literature review. *Agricultural Systems*, Volume 186, 102949, [online]. Available at: <https://doi.org/10.1016/j.agsy.2020.102949>
- West, T.A.P., Salekin, S., Melia, N., Wakelin, S.J., Yao, R.T., Meason, D., 2021. Diversification of forestry portfolios for climate change and market risk mitigation. *Journal of Environmental Management*, Volume 289, 112482, [online]. Available at: <https://doi.org/10.1016/j.jenvman.2021.112482>