Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 14, Issue 4, 2014
PRINT ISSN 2284-7995, E-ISSN 2285-3952

NORTH-EAST REGION - SUSTAINABLE DEVELOPMENT INDICATORS FORECAST 2014-2022

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Abstract

The present paper aims to forecast the evolution of the main sustainable development indicators for the North-Eastern region of Romania in accordance with their trends from the 2000-2013 and 2007-2013 periods. Our purpose was to compare and complete the result indicators of the Regional Development Strategy of the North-East Region for 2014-2020 and to improve, in this way, the monitoring process in the future. With this objective in mind, we concentrate our quantitative analysis on the main sustainable indicators which can be correlated with the strategic objectives. The results revealed that many indicators are over-dimensioned and that many sustainable indicators are not included in the monitoring process.

Key words**:** *assessment, sustainable development, development strategy, trends*

INTRODUCTION

Since the Brundtland Report (1987) [5] and the Rio Conference (1992) in the implementation and monitoring process of sustainable development were involved governments, organizations, universities, researchers, etc. All these entities developed indicators in order to understand the progress of implementation of the sustainable development strategies and guidelines. Until now, in the UN initiative for monitoring sustainable development there were involved over 1500 organizations in from 60 countries that have created more than 1,000 reports in the field [6].

The concept of sustainable development has been widely accepted and there has been recent progress in developing its measurement systems. However, progress has been much lower in the actual implementation of sustainable development measures [3] and the integration of the three pillars (economic, social, environmental) remains problematic because during international meetings " concrete discussions about moving towards a global economy based on reduced emissions of carbon are avoided... and international discussions have become disconnected from the real world politics "[2]. Although national governments have developed plans and strategies for sustainable development, the implementation activities didn't produce fundamental changes, these activities focusing on the introduction of the sustainability concept in society and on some fiscal ineffective measures [1].

Post-2015 Millennium Development Goals Agenda [7] aims to integrate the economic, social and environmental dimensions of sustainability, this time providing 17 objectives and involving over 100 countries (six regional consultations and 11 thematic consultations at world level).

In Romania, the first Sustainable Development Strategy was developed in 1997-1999 with the assistance of the United Nations Development Programme (UNDP) and involved a participatory approach coordinated by the Romanian Government. This document has provided the methodological framework for the implementation of Agenda 21 and was revised in 2008. In 2013 was elaborated the National Strategy for Regional Development which includes several aspects meant to ensure sustainable development.

MATERIALS AND METHODS

The main objective of the Regional Development Strategy of the North-East set for 2014-2020: "achieving sustainable economic growth, favorable to economic competitiveness and social inclusion", which can lead to a decrease of the gaps between regions.

The strategy set out four priorities which contribute to increasing competitiveness and attractiveness of the region [4]: improving human capital; modern infrastructure development; supporting a competitive economy and local development; optimum use and protection of natural resources. The strategy integrates all three dimensions of sustainable development, proposing detailed objectives and outcome indicators, from which but not all are measured. The future monitoring process is based on a set of measurable indicators selected by the? authors, that are meant to capture the essential regional impact.

Our approach was to determine how to evaluate the future implementation of strategic objectives (2014-2020) based on statistical socio-economic and environmental indicators and in the same time, to forecast the sustainable development evolution in accordance with the national and local INS-EUROSTAT methodology [2].

We focused on the main indicators afferent to the national objectives of sustainability. For each indicator we computed the linear trend equation (to estimate the trend for the 2014-2020 period, based on a three year evolution of the moving average indicator during the 2000-2013 and 2007-2013 period):

$$Y = a + bt$$

where: Y – the projected value for a selected value of t; a – estimated value when t=0; b – the slope in the line; t – value of time (coded).

RESULTS AND DISCUSSIONS

During the future implementation of the Regional Development Strategy for the North-Eastern Region 2014-2020, sustainable development objectives are to be pursued directly or indirectly through four strategic priorities and related measures. The objectives pursued are partially expressed through outcome indicators, which is why we propose concrete ways of tracking the process of sustainable development by correlating the trends from the last decade with strategic targets and with national objectives for sustainable development.

National objective - Structural changes and macroeconomic equilibrium

Disparity index for the GDP/capita

The proposed strategy of the disparity index of 25%, is not feasible in the context of the regional development from the last decade. We recommend maintaining the disparity at the level of 2013 or at least lower than 42.7% (Table 1).

Table 1. Disparity index for the GDP/capita (%)

Baseline	**2000-2013**	**2007-2013**
Trend Equation	**Y = 70,49 - 0,98 t**	**Y = 62,45 - 0,365 t**
2013	37.9	
2014	42.3	39.7
2015	43.2	40.1
2016	44.2	40.5
2017	45.2	40.8
2018	46.2	41.2
2019	47.2	41.6
2020	48.1	41.9
2021	49.1	42.3
2022	**50.1**	**42.7**
Strategic objective	**25%**	

Active enterprises per 1000 inhabitants

The strategy proposes 20 enterprises per 1000 inhabitants, but the potential is higher. We recommend supporting the creation of over 30000 new firms, so the number of enterprises per 1000 inhabitants can reach a value over 22 (Table 2). The annual rate of establishment has to be over 16.4%.

Table 2. Active enterprises per 1000 inhabitants

Baseline	**2000-2013**	**2007-2013**
Trend Equation	**Y = 10.28 + 0.57 t**	**Y = 16.57 – 0.818 t**
2012	13.6	
2013	17.2	12.5
2014	17.8	11.7
2015	18.3	10.8
2016	18.9	10
2017	19.5	9.2
2018	20	8.4
2019	20.6	7.6
2020	21.2	6.7
2021	21.8	5.9
2022	22.3	5.1
Strategic objective	**20**	

Share of employment in agriculture (%)

The strategy proposes a decrease of the share to 35% in 2022. Based on the evolution from the last decade, the indicator can decrease with only 5.7% per year. In this condition, the share will reach a value of minimum 42.9%, therefore, the strategy's target is not feasible (Table 3).

Table 3. The share of employment in agriculture

Baseline	2000-2013	2007-2013
Trend Equation	**Y = 51.92 – 0.429 t**	**Y = 48.44 – 0.001 t**
2013	47.3	
2014	46.3	48.4
2015	45.9	48.4
2016	45.5	48.4
2017	45.1	48.4
2018	44.6	48.4
2019	44.2	48.4
2020	43.8	48.4
2021	43.3	48.4
2022	**42.9**	**48.4**
Strategic objective	**35%**	

National objective – sustainable transport

Degree of modernization of public roads (rural and municipal) (%)

Our forecasts reveal a potential of growth between 12.3% (baseline 2000-2013) and 92.5% (baseline 2007-2013). In these conditions, the share can reach 23-39.4%, which means over 4500 km of modernized roads (Table 4). Even this target is high, but the strategy's target of 60% is obviously not reachable if we take into consideration that in the last seven years there have been modernised only *1300 km.*

Table 4. Degree of modernization of public roads (rural and municipal) (%)

Baseline	2000-2013	2007-2013
Trend Equation	**Y = 5.59 + 0.83 t**	**Y = 7.93 + 2.25 t**
2013	20.5	
2014	16.4	21.4
2015	17.2	23.7
2016	18	25.9
2017	18.8	28.2
2018	19.7	30.4
2019	20.5	32.6
2020	21.3	34.9
2021	22.2	37.1
2022	**23.0**	**39.4**
Strategic objective	**60%**	

National objective – Sustainable production and consumption

Rural localities with water distribution network

According to our forecasts, the water distribution network has a potential of expanding with 2400 km (70%) in rural areas. This means that about 85 villages could have access to drinking water systems, but only if the infrastructure works are implemented with an annual rhythm of 16.4% (13-14 villages/year). In these conditions, around 66% of the population will benefit from water infrastructure (faced with 80% - strategic target).

Table 5. Rural localities with water distribution network

Baseline	2000-2013	2007-2013
Trend Equation	**Y = 215.73 + 8.51 t**	**Y = 285.92 + 3.33 t**
2013	309	
2014	326	306
2015	335	309
2016	343	313
2017	352	316
2018	360	319
2019	369	323
2020	377	326
2021	386	329
2022	**394**	**333**
Strategic objective	**80% of population**	

Rural localities with sewage network

Regarding the sewage systems, our calculation reveals a potential of construction of only 360 km (at an annual average rate of 1.5%), which means only 15 villages (a maximum 5% of population) (Table 6). In this condition, only 35% of population will benefit, not 65% as expected in the strategy.

Table 6. Rural localities with sewage network

Baseline	2000-2013	2007-2013
Trend Equation	**Y = 88.68 + 1.36 t**	**Y = 93.75 + 3.13 t**
2013	123	
2014	106	113
2015	108	116
2016	109	119
2017	110	122
2018	112	125
2019	113	128
2020	115	131
2021	116	134
2022	**117**	**138**
Strategic objective	**65% of population**	

National objective – Conservation and management of natural resources

Area of forestry fund (thou ha)

The strategy proposes the reduction of the slope phenomenon for 250000 ha, including by afforestation. We propose that at least 7%

of this target should be done by afforestation therefore, at a regional level, we may have an increase of forestry fund (at least 17500 ha) (Table 7).

Table7. Area of forestry fund (thou ha)

Baseline	2000-2013	2007-2013
Trend Equation	**Y = 1186,84 + 0,33 t**	**Y = 1185,34 + 1,77 t**
2013	1192.5	
2014	1191.1	1196
2015	1191.5	1197.7
2016	1191.8	1199.5
2017	1192.1	1201.3
2018	1192.5	1203.1
2019	1192.8	1204.8
2020	1193.1	1206.6
2021	1193.5	1208.4
2022	1193.8	1210.1
Strategic objective	**25 thou ha – slope phenomenon reduction**	

National objective – Public Health

Infant mortality rate – rural areas

Regarding the health services in the last years, the infant mortality rate decreased. Based on this trend, our forecast shows that the target established by the strategy, of 8% can be reached. (Table 8)

Table 8. Infant mortality rate (%)

Baseline	2007-2013
Trend Equation	**Y =14.25 - 0,523 t**
2013	**10.4**
2014	11.11
2015	10.59
2016	10.06
2017	9.54
2018	9.02
2019	8.49
2020	7.97
2021	7.45
2022	**6.92**
Strategic objective	**8%**

National objective - Social inclusion, demography and migration

Risk of poverty and social exclusion rate (%)

Table 9. Risk of poverty and social exclusion rate (%)

Baseline	2007-2012
Trend Equation	**Y =54,328 – 0,942 t**
2012	**52.3**
2013	49.6
2014	48.7
2015	47.7
2016	46.8
2017	45.9
2018	44.9
2019	44
2020	43
2021	42.1
2022	**41.1**
Strategic objective	**3.5%**

This indicator's trends reveal a potential of decreasing the rate with 1.4% annually, which means around 400 thou people.

This would mean a rate of 41.1% in 2022. We believe that the rate of 3.5% - reducing persons at risk from 1.95 million to just 127000 - is not realistic.

CONCLUSIONS

In conclusion, the research conducted, based on the analysis of the Regional Development Strategies in the North-East for 2014-2020 and the trend line for sustainable development indicators, aims to improve the future implementation of the strategic objectives by offering progress monitoring solutions, through limiting the oversized values. The target indicators proposed in this work allow a realistic estimation by measuring the impact of strategic objectives. In this context, we believe that the outcome indicators proposed and substantiated from the previous trend of the region, for all 2014-2020 strategic priorities, can be better shaped into a major impact on regional sustainable development.

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