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Evaluating the Romanian administrative framework for the instruments of natural hazards management

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Evaluating the Romanian administrative framework for the instruments of natural hazards management

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Evaluating the Romanian administrative framework for the instruments of natural hazards management. The article analyzes Romania's resilience in the face of climate change and natural risks generated by this phenomenon, by assessing the activity of their management structures in relation to climate risks. Within the two main parts of the paper, the Sustainable Development goals were analyzed by identifying the management aspects of SDG 13 - Climate Action, respectively a statistical analysis was presented on the actions of prevention, preparedness and response to natural risks, carried out by the Romanian General Inspectorate for Emergency Situations (IGSU) and the Inspectorate for Emergency situations "Dealul Spirii" Bucharest - Ilfov, for the period 2018-2020. Thus, it was found that Romania has a high degree of vulnerability in terms of disaster risks generated by climate change, and the efficiency of the strategic management carried out by the central authorities is low, as no particular attention is paid to the steps taken in these steps. The most acute problems identified at this level are those related to the development of strategies and missions, the organizational aspects and the lack of infrastructure necessary in terms of disaster management, especially those caused by the environmental factor.

Keywords: resilience, risk, climate change, institution.

Évaluation du cadre administratif roumain pour les instruments de gestion des risques naturels. L'article analyse la résilience de la Roumanie face au changement climatique et aux risques naturels, en évaluant l'activité des structures institutionnelles à compétences spécifiques. Il y a deux parties principales de l'article. Dans la première partie, les objectifs de développement durable ont été analysés en identifiant les aspects de gestion de l'ODD 13 - Action sur le climat. Dans la deuxième partie, une analyse statistique a été présentée concernant les actions de prévention, de préparation et de réponse aux risques naturels, menées par l'Inspection Générale des Situations d'Urgence (IGSU) et l'Inspection des Situations d'Urgence "Dealul Spirii" Bucarest - Ilfov, pour la période 2018-2020. Ainsi, il a été constaté que la Roumanie présente un degré élevé de vulnérabilité face aux risques de catastrophes générés par le changement climatique, et l'efficacité de la gestion stratégique menée par les autorités centrales est encore trop faible. Les problèmes les plus prononcés identifiés sont ceux liés à l'élaboration des stratégies et des missions, les aspects organisationnels et le manque d'infrastructures nécessaires en matière de gestion des catastrophes, notamment celles causées par le facteur environnemental.

Mots clés : résilience, risque, changement climatique, institutions.

1. INTRODUCTION

In essence, natural disaster management is based on three guiding principles: (1) prevention, preparation and response, (2) post-event evaluation and (3) restoring the initial situation (Comitetul Naţional pentru Situaţii de Urgenţă, 2020).

In 2011, the European Commission established the EU Civil Protection Mechanism, which aims to increase the level of cooperation between EU member states and other states in the field of civil protection. This mechanism can be requested when a state is out of date in terms of disaster response. The EU focuses its attention on developing a common agenda to increase the capacity of all Member States to cope with natural disasters and the implications they bring (European Commission, 2021).

The first risk assessment activity was carried out in Romania within the RO-RISK - SIPOCA project, during which the following main objectives of action in risk management were identified, such as: (a) Streamlining the institutional mechanism in risk management, (b) Improving infrastructure for prevention, response and operations and (c) Development of human resources involved in risk management actions (World Bank, 2020).

For the horizon 2021-2025, Romania aims to carry out, for example, a project entitled "strengthening disaster risk management", which will be financed with the help of financial resources received from the International Bank for Reconstruction and Development, in the form of a loan. The adaptation mechanisms provide for the integration of the social component in order to increase the operational capacity in terms of natural disasters, but also of cultural resilience, with the continuous training of persons involved in the disaster management process and the creation of special risk communication programs with communities vulnerable to them (Comitetul Naţional pentru Situaţii de Urgenţă, 2020).

Under these programs, the needs of these communities need to be assessed, what is the role of adaptation capacity for each ethnic group, or the role that risk communication would play in the context of disaster risk reduction (Lucini, 2014). The special programs created depend generally on the cultural and socio-economic context of people, but also on the level of vulnerability or ability to cope with the shock caused by disasters, as mentioned in the study conducted by Paul and Routray (2011), on strategies for adapting communities in the context of the appearance of cyclones. This study highlights common strategies that people are taking to mitigate the impact of natural disasters, such as prioritizing measures to save goods and food through housing building methods, methods that largely envisage the use of water-resistant materials (Paul, Routray, 2011).

From another perspective, the adaptation mechanisms provide for the use of space technologies, combined with certain demographic characteristics, in order to determine

the degree of vulnerability of buildings and built structures exposed to disasters, and implicitly the level of exposure of the population. Thus, data can be obtained, such as the structural characteristics of buildings or built structures, or data on the level of exposure of communities to different spatial and temporal scales. The main advantages of this measure are high geographical coverage, low costs and fast analysis time. This view was approached in the city of Bishkek, Kyrgyzstan (Wieland et al., 2012).

A third perspective identified in the literature consists in creating strategies focused on the transition from traditional governance to governance involving stakeholders and forming social networks that can implement disaster risk mitigation measures. According to this perspective, disaster prevention policies have begun to focus on what means "systematizing risk management functions", combining the overall prevention policy with some measures proposed by the actors and implementing organizations, generating results such as risk maps, risk prevention or disaster insurance measures (Ikeda, Nagasaka, 2011).

With the increase in the number of assets, disaster risk becomes more prominent, although there are a large number of data or analysis tools, given that there is no strong link between the interaction between science and practice. It is necessary to create an optimal framework for the transfer of knowledge about risks and their specific factors to stakeholders. Risk management can be studied through the lens of numerous disciplines, which has led to the development of several methods and tools for research and risk management (Komendantova et al., 2014).

Participatory modeling, as an integral part of the risk governance process, requires stakeholders to contribute to ensuring systems for risk assessment and decision support, leading to a better understanding of the perspectives, standards or compromises that can be made. This modeling can be done using main tools such as STELLA (Costanza, Voinov, 2001), as well as HAZUS for the US, RiskScape or CAPRA, which bring into account unique risk assessments depending on the territory. Later, other instruments were identified for several territories, such as HAZTURK and HAZTAIWAN, or CAPRA in Central America or Asia (Komendantova et al., 2014).

Through Risk assessment by defining a model of indicators method, vulnerability indices can be defined according to several dimensions, from socio-economic and environmental, to institutional and cultural ones. One such model was demonstrated by Hernández et al. (2018), calculating the hurricane risk index (HRI). This model involves defining, first of all, the components and indicators of hazard – in this case the hurricane, but also of vulnerability. The indicator system consists of three stages of assessment: The hurricane hazard, its vulnerability and size and the risks by calculating the hurricane risk index (HRI; Hernández et al., 2018).

Multi-criteria decision-making (MCDM) method is based on the selection of those alternatives that are most satisfied with the criteria that have been defined from the earliest stage, so that the conflict between the criteria can be resolved. The MCDM operates on two approaches: (A) the compensatory approach, whereby full compensation can occur, transforming the basic problem into one that has a single criterion, and (b) the alternative one, which provides for a non-compensatory type of assumption between the criteria and which partially or not approves the compromises. In order to reach the first approach, tools such as Multi-attribute Utility Theory (MAUT) and analytical Hierarchy process (AHP) are used for basic problems with reduced difficulty. On the other hand, for those with high difficulty, i.e. for the second approach, PROMETHEE and ELECTRE can be used, which combine the unfavorable results of a criterion with the favorable ones (Edjossan-Sossou et al., 2020).

The Social vulnerability Index (SEVI model) and the Social vulnerability Index (Sovi model) contribute to better analysis and understanding of social vulnerabilities in major cities, compared to supporting stakeholders taking part in decision-making, in the context of increasing disaster resilience capacity. Such an assessment highlights the grouping of units with attributions regarding the population census with the overlapping of those areas with a high degree of social vulnerability. Using GIS, based on the data sets, there are several methodological steps, from downloading problems in sub-index, selecting and standardizing the significant ones, to comparing and expressing preferences, resulting in composite maps of these indices (Armaș, Gavriș, 2013).

Romania's adaptation to climate change and disaster challenges requires a reconsideration of strategies, policies and programs, in addition to their much more flexible approach, public authorities being forced to interact more with both internal and external factors. Although the pressure of these changes can be high at first, it is necessary to change the attitude of the public authorities so that we have long-term rational objectives, focused on the current requirements (Departamentul pentru Dezvoltare Durabilă, 2018).

For horizon 2020, the two targets were set as follows: (1) integrating climate change adaptation measures into sectoral development strategies and policies and their cross-sectoral harmonization and (2) raising awareness of the impending climate change both at the political level of state institutions and among all citizens, regardless of age. For the first target of SDG 13, the greenhouse gas emissions indicator is noted, by NACE Rev. 2 activities. 2, which makes significant contributions to its assessment process, which determines the integration into national policies and strategies of measures that allow the country to adapt to climate change. Under the first target, it is worth mentioning that, in order to implement a sustainable development objective, such as the one chosen - SDG 13, the connection to the financing mechanisms and

instruments made available by the European Union, it is an important step in terms of adapting to the norms imposed on the Romanian state. Using them, Romania was able to align with the requirements for lowering GHG emissions. This alignment would not have been possible without the strengthening of the legislative system and the integration of specific conditions for the beneficiaries of funding, because European money must bring results over a period of several years, and the sanction of violating these laws and requirements involves returning the benefits received and other sanctions depending on the existing situation, which educates citizens to resort to sustainable behavior. Although our country has started at a lower level than the other Member States and still has to recover in terms of the results targeted by the EU, there is still an improvement in the situation of the country's sustainability indicators, a good example being the GHG emissions indicator itself (Departamentul pentru Dezvoltare Durabilă, 2018).

For horizon 2030, four targets were set, as follows, according to the National Sustainable Development Strategy for Romania: (1) Strengthening Romania's resilience and capacity to adapt to climate and natural disasters risks; (2) Improving the ability to react quickly to extreme weather events of high intensity; (3) Improving education, awareness-raising and human and institutional capacity for climate change mitigation, adaptation, impact reduction and early warning; and (4) Stepping up Romania's efforts to achieve the transition to a green, low-carbon economy, resilience to climate change and to integrate climate change adaptation measures in vulnerable economic, social and environmental sectors (Departamentul pentru Dezvoltare Durabilă, 2018).

2. METHODOLOGY

As regards the methodology (Figure 1), there were two stages of carrying out the paper, as follows: (A) the stage of analysis of the institutional mechanism and the activity of intervention structures, and (b) the stage of analysis of the regulatory documents for the concept of sustainable development at the country level. As a matter of priority, the quantitative method was used to objectively collect and interpret the data relevant to the study, so that ultimately there was a cause and effect determination of how the institutions in charge responded to climate challenges. The indicators chosen for this study contribute to the interpretation of the results obtained from the work of central public authorities and disaster response structures.

2.1. Study area

The following institutions contribute considerably, through their attributions, to risk management, as follows: The Romanian General Inspectorate for Emergency Situations (IGSU) - which has a dedicated chapter; Ministry for Development, Public

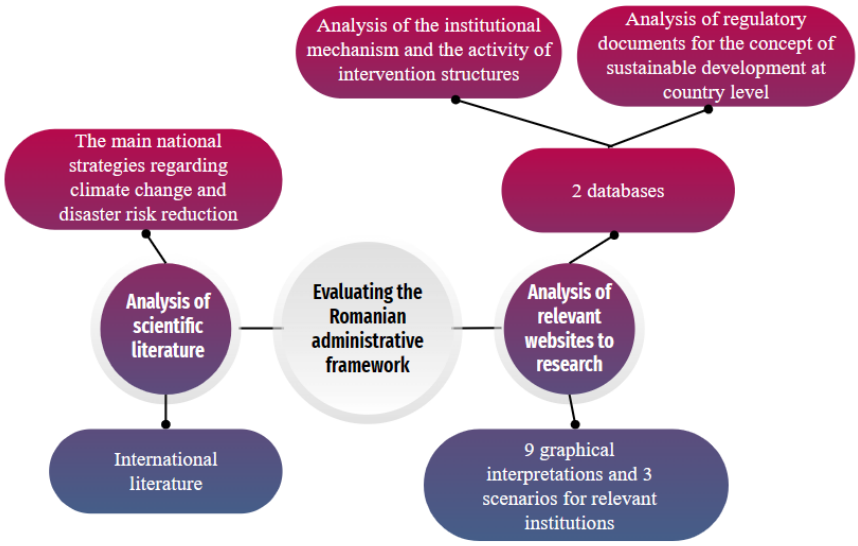

Figure 1. Methodology for the design of the article

works and Administration of Romania; Ministry of Environment, Water and Forests; Romanian Ministry of Public Health and Romanian Ministry of Agriculture, Forests and Rural Development (Table 1).

2.2. Study design

The analysis of the institutional mechanism and the activity of intervention structures has been performed based on the information provided on the website of the General Inspectorate for Emergency situations (IGSU, Ministry of Internal Affairs, Romania) in 2022 year.

The purpose was to identify both organizational and management documents for these structures. In order to create a synergy between the work of these structures and relevant policies related to the climate change and natural disasters, national strategies related to local development, climate change and risk management have been identified on the website of four ministries with responsibilities in the field. These analyses resulted in two databases:

a. A first database with indicators relevant to the Sustainable Development Goal no.13 and climate change, in order to identify the Romania's position in relation to these challenges, and

b. the second database including data on natural risk management, for the period 2018-2020, namely the assigned resources, or number of interventions and actions performed according to several factors of influence.

These data have been centralized and processed in Microsoft Excel spreadsheet Software, in accordance with the research objectives.

Table 1. Organizations in Romania with attributions in the field of risk management

Organization	Main duties	Scale
The Romanian General Inspectorate for Emergency Situations (IGSU)	Integrated national coordination activities for prevention and management of emergency situations and civil protection	Local level, through 42 operational structures and 280 operational substructures
Ministry for Development, Public works and Administration of Romania	Contributes to the realisation of government programmes and the development and implementation of policies, strategies or plans in the field;	National level
Ministry of Environment, Water and Forests	Implements policies, strategies and projects in the field concerned; coordinates certification/ safety certification	National level or local level (through county agencies)
Romanian Ministry of Public Health	Sets public health priorities and carries out health inspections	National level
Romanian Ministry of Agriculture, Forests and Rural Development	Develops public policies in areas of competence and ensures that strategies and policies are implemented	National level or local level (through county agencies)

3. RESULTS

In this paper, we analyzed the main national strategies regarding climate change and disaster risk reduction, as listed the introduction of the paper: Romania's 2021-2030 Integrated National Energy and Climate Plan, National Sustainable Development Strategy for Romania, Romania's National Strategic Plan 2023-2027 and National Disaster Risk Management Plan. In accordance with these, we have analyzed what are Romania’s main concerns regarding ensuring a much more sustainable community in relation to the sustainable development goals, but also what is the capacity of the main institutions with attributions in the field to cope with natural hazards.

From the point of view of institutional response to risk, in order to implement these disaster risk mitigation measures, institutions with relevant responsibilities in the field benefit from generous budgets. In the National disaster risk Management Plan, for

the financial year 2021-2027, budgets were proposed in relation to the new targets proposed at EU level and the support it proposed to provide to Member States, in order to manage strategies, programs, programs and programs more effectively or targeted projects. That is why, as you can see in the chart below, the Romanian General Inspectorate for Emergency Situations and the Ministry for Development, Public Works and Administration of Romania are the institutions with the highest budget allocated, of about 4 million lei, which means they have the greatest responsibility in relation to the research topic. On the other hand, for 2027 it is estimated that the budget will be much higher than in 2021, except for the Ministry of Environment, Water and Forests (Figure 2).

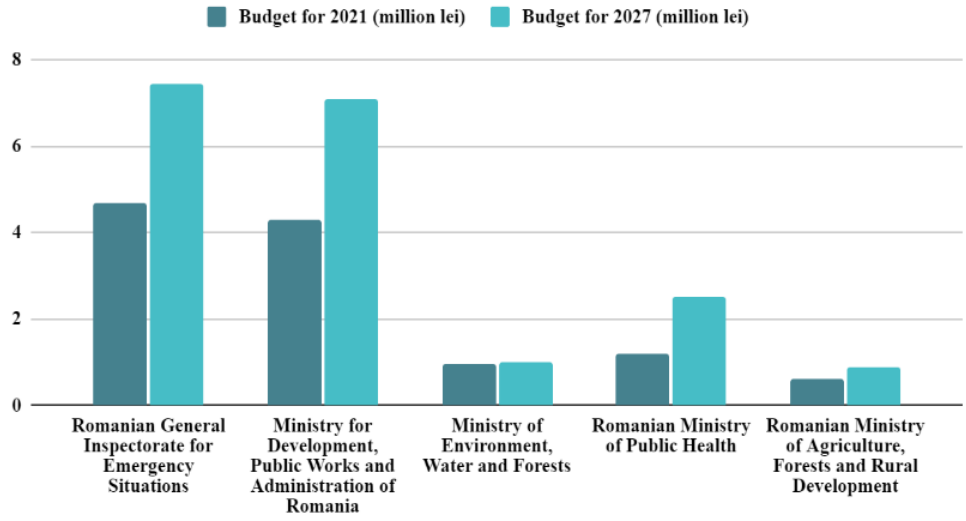

Figure 2. The budget allocated for the institutions involved in risk management for the period 2021-2027

Source: Comitetul Național pentru Situații de Urgență, 2020

In this regard, it is noted that about 94 000 requests for approval and authorization were registered and solved, while about 130 000 were registered for both controls and preparatory actions. At the level of the interventions, about 103 000 interventions were recorded for the extinguishing of fires and about 78 000 interventions for the protection of communities. The number of requests for approval and authorization of activities was recorded in 2018, with around 34,000 in number, while 2019 brought some stagnation and 2020 a decrease below 30,000 requests, due to the crisis situation caused by COVID-19. There were also between 40 000 and 45 000 controls, with 2019 having the most. From these checks, it has emerged that the deficiencies found have slightly exceeded the 150 000 threshold and that addressing the

deficiencies was not precisely a priority for the population. Fire-fighting interventions reached a high point in 2019, with about 40 000 interventions, the vulnerability to this risk being quite high, mainly due to the high poverty in the majority of the country, or due to the ignorance of the population due to low education. Also, in Romania, interventions for various emergency situations remain at a high threshold, the protection of communities being another common type of intervention, followed by interventions for floods and landslides (Figure 3).

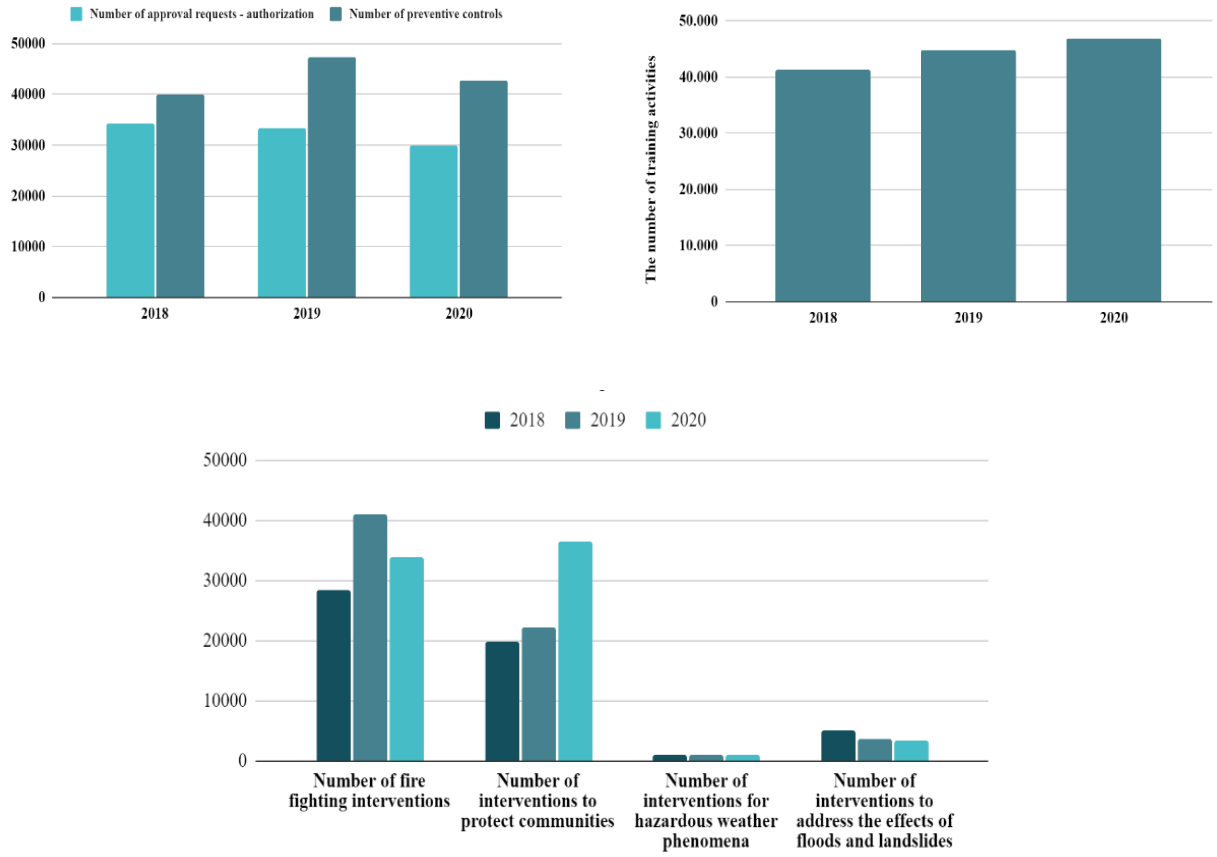

Figure 3. The prevention, preparedness and response actions for the period 2018-2020
Source: Inspectoratul Național pentru Situații de Urgență, 2020

4. DISCUSSION

Management actions shall present the following classification: Actions to prevent, protect, intervene, restore or maintain safe conditions. With regard to policies and strategies, it can be noted that there is a separate set of environmental objectives, largely to reduce the effects of climate change. Disaster prevention or response measures shall be complemented by risk financing programs, either at the general level

or separately, and particular attention shall be paid to some of them, such as earthquakes, floods or epidemics.

For preventive actions, characterized by authorization - approval activity, it was found that the number of applications is much higher compared to the number of specialists in the field, the average of specialists being 1 specialist for small cities, or 3-4 specialists in large cities, the demands are in the hundreds. For preventive actions, characterized by preventive control activities, it can be mentioned that the number of controls is increasing from year to year, and the average number of specialists is 4-5 specialists for each county separately. Also, at the level of information activities, being the third category, it is noted that the authorities prefer physical materials, such as posters, flyers and brochures, with a total of over 4 million informative materials recorded in the period 2018-2020.

For the preparatory actions, the main responsible body is the General Inspectorate for Emergency situations (IGSU, Ministry of Internal Affairs, Romania). There are three main categories of structures insubordination: (A) National Center for improvement of Emergency Management Training - Ciolpani, (b) zonal training centers and (c) training and training centers, the difference between them being the category of actors requiring training (civil servants, inspectors, directors of public institutions, etc.). During the analyzed period, the demand for organizing these courses increased, 2020 being the most intense.

As for response actions, according to reports, the main cause of death is fires, often caused by the use of faulty or improvised electrical equipment, installations, smoke burns or sparks from heating systems, with most cases recorded in urban areas. There have also been identified fires in dry vegetation, transport or industry.

In the management system specific to Germany, the idea is highlighted that “the resuscitation room must be brought to the patient and not the other way around”. This system requires the patient to be transported to the hospital that is most appropriate to the patient’s needs, not to the nearest hospital. The country-specific disaster management is closely linked to the attribution of specific activities to stakeholders, with the attributions being shared between the private and public systems (Fischer et al., 2011).

In Bangladesh, the most prominent risk is flooding, so authorities have in recent years started using a management approach that includes both risks and consequences. This approach refers to increasing the number of institutional partnerships, including the participation of nonprofit organizations and private companies, so that the objectives assumed in national strategies are achieved. This study highlights that the way they are formed and collaborate with each other is the main indicator in assessing the current disaster management approach (Khan, Rahman, 2007).

Istanbul authorities are focusing on upgrading existing buildings, with the idea that this could have the biggest impact on the decline in human casualties in Istanbul. Although there are a lot of assessment and modernization applications for public or commercial buildings, no significant efforts have yet been made to strengthen the stock of residential buildings, which is a priority for these authorities at the moment. Other complementary measures are those regarding the application of a new design code according to current needs, increasing the number of citizens' awareness activities, a more effective regulatory framework on urbanism and carrying out controls to private companies with responsibilities in the field (Erdik, Durukal, 2008).

In the Netherlands, authorities rely on flood prevention activities through the implementation of structural measures, which provide an optimal level of protection against a projected discharge of 1/1250 per year, and non-structural ones aim to reduce vulnerability. Also, given that these measures are costly, a compromise between construction costs and flood losses is needed through cost-benefit analyzes. The Dutch authorities use these analyzes to identify those measures that are most efficient in relation to the efficiency of financial resources, like separating polders by additional dikes (Baan, Klijn, 2004).

In the case of Algeria, dysfunctional urban policy, as a result of the legacy of urban settlement models and borrowed foreign approaches, has led to the need for the current analysis of territorial organization, focusing on the causes of the failure of the urban policy process, so that, in the face of natural disasters, there is a much lower vulnerability (Lakhdar Hamina, Abbas, 2015).

5. CONCLUSIONS

In Romania, vulnerability to natural disasters remains a major societal challenge, which requires an effective disaster management framework that focuses on the real issues facing the country's population and the institutions responsible for this management. The current strategies and programs are generous with regard to the proposed measures, most focusing on increasing the response capacity of disaster management authorities, developing mechanisms for exploiting data and information to mitigate risk, development of personnel intervention capacity and modernization or rehabilitation of vulnerable buildings and infrastructures. Besides these, there are many measures and objectives that the Romanian institutions have assumed that they will implement in the new financial year, but many of them remain unimplemented, the reality being different from the one on paper. An approach that takes shape around prevention, supported by a common approach between institutions, other organizations and citizens, will have a much greater impact in managing the disasters and socio-economic challenges that the Romanian society faces.

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