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Leah, Tamara

Institute de Soil Science, Agrochemistry and Soil Protection "N. Dimo"

20 November 2014

Online at <https://mpra.ub.uni-muenchen.de/61723/>

MPRA Paper No. 61723, posted 01 Feb 2015 05:34 UTC

# RESPONSE POLICIES AND STRATEGIES FOR INTENSIFICATION PROCESSES OF LAND DEGRADATION AND DESERTIFICATION IN THE REPUBLIC OF MOLDOVA

TAMARA LEAH<sup>1</sup>

**Abstract.** *Soil, the main means of production in agriculture of Moldova suffered a progressive deterioration in the last 20-30 years due to a intensive operations without adequate investment to preserve and improve its natural properties. Intensive exploitation led to changes in chemical composition (dehumification, alkalization, salinization) and structure (compaction) and degradation through erosion, pollution, landslides etc. It was estimated a loss of agricultural potential of the soil to 40% due to these direct negative effects of soil degradation. Policy analysis and response strategies showed that the state support of agriculture is very limited. There is no single source of information, containing reports on the amounts (internal and external) have been allocated, the distribution thereof and the name of the projects implemented or under implementation. Evaluation and monitoring of donor funded projects is made in several stages. In this process not involved beneficiaries and the results are made public only in some cases, depending on the scope of the project. To overcome the problems caused by land degradation is required structural agricultural policy, to ensure better use of land.*

**Keywords:** *agriculture, degradation, policies, soil, strategies*

## INTRODUCTION

Over half century the agrifood sector of the Republic of Moldova was developed in foreign terms of market economy. During the transition period there have been efforts to reform the property, creating a competitive production and diversification of external economic relations. But the crisis in the agricultural sector has not been exceeded, it carries a structural character and is caused by contributions that occurred during integration into the market economy structures inherited from the centralized economic system. In recent years there has been a visible decrease of agricultural crops productivity: from 3/1 of cereals and sugar beet, to 50% and more of fruits, vegetables, grapes and tobacco. Reduction of productivity in agriculture is caused by natural and anthropogenic factors leading to soil and land degradation, intensification of desertification and drought. As a result of increased of land degradation processes, the excessive fragmentation has a negative impact on agricultural output because in these conditions is possible only low labor productivity. Another factor of the domestic agriculture land crisis is Soil Law, and how poor it was applied thereby causing the worst agrarian structure of the last century. Moldova became the country with the most fragmentation of agricultural land in the Europe bringing to a situation similar to that in the interwar period, which means that more than 70% of properties measured the 3 ha (of which more than half have less than 1 ha area) and properties greater than 10 ha represent only 0.5%, divided in 3-5 plots (Gheciu et al., 2012).

## MATERIAL AND METHOD

As materials were used agricultural policy documents referring to national programs, development strategies, action plans intended to diminish soil degradation and increase their fertility; traditional agricultural practices developed on this subject, which is being made. The method used - evaluation of policies and response strategies on the intensification of land degradation and desertification, comparative analysis, which were identified main causes problems stopped achievement in agriculture.

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<sup>1</sup> Assoc.prof. PhD., Institute de Soil Science, Agrochemistry and Soil Protection "N. Dimo", tamaraleah09@gmail.com

## RESULTS AND DISCUSSION

The dominant character of agriculture in Moldova's economy is due to its moderate climate and fertile soils. Chernozems occupy 80% of the country territory. Share of agriculture with manufacturing of agricultural raw materials account for around 33% of GDP and 65% of total exports. Having production capacity of fertilizers, pesticides, mineral feed additives, veterinary medicines and fuel, Moldova depends on imports. According to official statistics, agricultural production fell by about 35% in the first half of the 90 yrs. and 20% - in the second half, now being less than 50% of the years 1989-1991 (*Reforma, 2011*).

The privatization process of agricultural land occurred within two stages: the first - "*small privatization*", which led to a substantial increase in assigned areas of rural families (up to 300 thousand ha in 1990-1992), and the second - "*large privatization*" which expanded on land cultivated by former collective farms. During the second stage, the rural population by offering titles and were sent privately owned agricultural land shares (*Muravschi, 2002*). The process has resulted in a highly fragmented structure of land ownership, which led to the intensification of soil and land degradation. Agricultural soil degradation results are presented by destructuring processes, compaction, humus, destruction by erosion and landslides, etc. These negative consequences are well known and multilateral research. To mitigate and avoid their various concrete measures have been developed, specific technologies and procedures that form complex systems or processes regional mitigation and protection of soil degradation (*Erosion, 2004*).

***Complex National Program for Soil Fertility Increase (2001-2020)***. Goal - promoting and developing by the central and local public administration a unique policy of the state in planning, organizing exploitation and protection of soils and agricultural land, development of a complex and scientifically based measures to increase soil fertility, improve the institutional and legal framework for the regulation of land relations. In the Program, Chapter II "System of measures to combat soil fertility degradation and increase" are given basic principles and objectives of the strategy to combat degradation, protection and sustainable use of soils. Action Plan (program annex) reflects the complex of measures to combat soil degradation forms (organizational, general, sustainable agriculture, the erosion control works, to combat landslides, grassland ecological reconstruction, fertilization, irrigation, combat drought).

***Recovery Complex Program of degraded lands and increase soil fertility (2001-2015)***. *Part I. Improvement of degraded land*. It was developed in accordance with art.12 and 14 of the Law on normative price and the sale of land 1308-XIII of 25 July 1997 and Government decision no.1027-402 of 04.05.1998. The program sets overall strategy and tactical guidelines of state policy for the protection, improvement and sustainable use of land resources, long-term maintenance of quality and production capacity of soils for food security and ecological security of the country. Are presented scientific methods and procedures to improve degraded soils, the complex of measures on improvement of soil based scientific elaborations.

***Recovery Complex Program of degraded lands and increase soil fertility (2001-2015)***. *Part II. Increasing soil fertility*. Goal - preserving and enhancing soil fertility of degraded low production level, and those with less manifestation of natural and anthropogenic risk factors justified applying of fertilizers, crop rotation implementation, expansion of irrigated land and other measures that contribute to regenerate fertility soils and food security of the country. Some resources to improve soil fertility are presented and characterized livestock waste. In the last 10 years the amount of organic fertilizer applied in agriculture declined from 9700 thousand tons in 1990 to 75,4 thousand tons in 2001 to minor amounts (10 kg/ha) in the present.

Actions planned in the programs mentioned above were partially implemented (10 percent). Unrealized measures can be translated into reality within the activity of landscaping at the household, district, country level. The measures of protection, improvement and sustainable use of soils can be achieved through researches and projects that are long-term action, but require massive investment from the state, businesses and organizations dealing with environmental and sustainable development issues.

***Program of conservation and improvement of soil fertility (2011-2020).*** Goal - implementation of measures to stop the degradation and increase soil fertility by upgrading and extension of land improvement, implementation of modern technologies and environmentally friendly agricultural practices. Provisions: providing scientific effort; create Automated Information System of soil quality status based on soil and agrochemical research; stop the degradation of the active forms of soil cover (erosion, landslides, gullies) by extending of land improvement works; increase the soil fertility by implementing environmentally friendly agricultural practices, harmless system of fertilization, irrigation and extension compliance agricultural technologies.

***Program of conservative agriculture (2014-2020).*** Goal - to promote the conservative agriculture system in versions to adapted at the soil condition and the requirements of the main crops to ensure competitive quantity and quality production, with lower costs and higher profit in terms of improving soil characteristics and functions in agroecosystems, enlarged reproduction of pedogenesis and environmental process. Preventive restoring of soil degraded characteristics of arable and underlying layer on the land planned for phased implementation of Mini-Till and No-Till annually on the surface of 10000 ha.

***National Program "Moldovan Village" (2005-2015).*** The purpose of the implementation will serve as a basis for achieving its priority in rural areas. In this program states that will be developed and implemented risk mitigation mechanisms and repair the damage caused by climate deviations promoting extension services that would allow the transfer of knowledge on how to implement the erosion and crop rotation systems for the processing soil and combating drought. It will encourage the planting of forests on lands vulnerable, degraded and damaged. Will be improved weather forecasts and hail system will be developed. It will invest in irrigation systems, including the development of small-scale systems. It will develop and promote of agricultural crops insurance schemes.

***Strategy for Agriculture and Rural Development of Moldova (2014-2020).*** The purpose - to enhance completeness food sector through an extensive restructuring and modernization and to improve quality of life and work in rural areas by creating a strategy between food activities and the natural environment. For the entire purposes three priorities and nine measures were identified. The expected impact is to achieve this goal sector, including the structure and use of land resources, improving soil quality.

***Strategy of agrifood sector development (2006-2015).*** In this strategy shows that state efforts to revitalize the livestock sector are geared towards creating the next 10 years a system of small and medium business units based most on private property. The strategy envisages obtaining and developing new breeds of animals and birds high productivity, competitive both in the domestic and foreign markets. Main link to the sphere of production of livestock is due to a homestead (farmer), based on private property with a farm commodity production of milk and meat, provided 18-20 acres of agricultural land and technical processing the earth and animals. The strategy proposes improving the subsidizing local farmers in the livestock sector in the state, in order to facilitate their work. Strategy forecast annual growth of global agricultural production by 7.5 percent, increasing the share of processed agricultural output by 20 percent and organic production to 10 percent by 2015 to increase the real incomes of agricultural workers to 85 percent from the average on the economy.

***National Development Strategy "Moldova 2020": seven solutions for growth and poverty reduction.*** Objective - providing quality economic development and therefore poverty reduction. In 2010, the poverty rate was 21.9%. If use the 2010 level in the baseline scenario the poverty rate in 2020 will decrease to about 16%. However, with the implementation of the priorities, it will significantly reduce up to 12.7%, or 3.3% more than in the baseline scenario, which is potentially 149 thousand people out of poverty. The strategic vision of the Government's medium and long-term reconciliation between the need for accelerated economic development and environmental protection in accordance with European standards.

***Environmental Strategy for the years 2014-2023.*** Application of Environmental Strategy for the years 2014-2023 will cost about 9 billion. lei. Costs were estimated in the negotiation of the Association Agreement and the Free Trade Agreement with the EU. Expenses to be covered by internal resources (State budget, National environmental fund, Regional development fund, Fund energy efficiency) as well as foreign investment. New Environmental Strategy aims to ensure the population of Moldova right to a sustainable environment unpolluted and healthy in the context of economic development. The document establishes that the next 10 years to develop a modern organic through the development and adoption of an environmental legal framework at European standards. Stipulated provisions that will reduce the negative impact of economic activity on the environment, but will also increase the level of environmental protection by at least 50%. Also included are measures of protection and biodiversity conservation, recovery of ecosystems, reduce greenhouse gas emissions by at least 20 percent until 2020, reducing the amount of waste by 30% and increase the recycling rate to 20% until 2023. According to experts, a result of the strategy, over 80% of the population will have access to quality water and over 65 percent - to sewerage systems.

***Strategy of Food safety (2011-2015).*** The aim - to achieve the highest level of protection of public health and consumer interests in terms of food safety. The strategy is a prerequisite for the adoption of EU food safety principles and achieve integrated approach "from fork to hayfork" to ensure public health and to allow increased exports.

***Strategy of Land Consolidation (2012-2027).*** Objective - consolidation of agricultural land in order to stop the land degradation. Main activity: implementation of land consolidation projects. External funding for the implementation of building projects: World Bank, United States Agency for International Development, Swedish International Development Agency, European Union programs, including the Rural Development Program.

***European Strategy of the Republic of Moldova.*** One of the major regression in agriculture reached is that agriculture has lost its industrial character altogether. Create a system of "allowances" in Moldovan agriculture significantly reduced the potential development of an intensive agricultural industries based on modern scientific methods. Priorities: creating the conditions for the purchase of seeds, fertilizers and pesticides; reducing transportation costs through supply sufficient fuel producers; purchase by association modern agricultural equipment; processing of agricultural production to marketing within single centers respective associations; linking agricultural production supply producer associations with actual demand of the market; improving agricultural property structure by promoting economic incentives to increase farm; rural infrastructure development; development of systems for the collection, storage and distribution of agricultural products; create a national land administration and control; establishment of necessary institutional structures near the Common Agricultural Policy coordination.

## CONCLUSIONS

To overcome the problems caused by land fragmentation is required structural agricultural policy, to ensure best use of degraded lands. Concentration of agricultural production is one of the essential conditions for the development of productive capacities and competitiveness to achieve a sufficient level of integration in the European Union. Here it is important to identify potential sources of progress in the agricultural sector and the conditions necessary to attract them. If Moldovan agriculture, the main source of agricultural progress are implementing new technologies, practicing consistent economic policies and institutional development appropriate strategies.

Systematic action plans on measures reducing soil degradation processes in different national and planned development strategy is just a first step, the next step is implementation. At the stage of implementation of recommendations and actions occur the difficulties, such as incompetence, irresponsibility, lack of agricultural and laboratory shortage of material and financial resources, etc. Result: develop strategic action plans are not implemented. Making action plans

would contribute, on the one hand to obtain higher production volumes and highest quality indices, on the other hand, to effectively preserve and enhance soil fertility and biodiversity.

Soil protection should become one of the objectives of the National System for Monitoring Land, where it is necessary to develop environmental standards and norms, primarily to determine optimal and critical levels of various indices according to their soils genesis, climate, cultures and technologies of cultivation, to make predictions of long-term soil quality and present concrete recommendations unfavorable regulatory processes. In the case of Moldovan agriculture, the main source of agricultural progress are implementing the new technologies, practicing consistent economic policies and appropriate institutional development, implementation of action plans and long term strategies.

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