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MANAGEMENT OF AGRICULTURAL ECOSYSTEM FROM DETRIMENT AREA. CASE OF STUDY - BACĂU

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Abstract: At present, the agriculture is under the impact of a new type of economy and European structures integration. Therefore, agriculture must be approached as an important branch of the national economy but also because people must eat and because self-agrifood and positive commercial balance are promoted in the world. So, principles of market economy must be followed including constant modifications during reform of agricultural economic base. To achieve that, it is necessary to adopt new laws in agriculture, to conduct modernisation of rural infrastructure and to protect ecosystem through preservation and improvement of agrifood chain functionality.

Key words: ecosystem protection, rural infrastructure, European structures.

Zone description

Drobotfor hydrographic basin (Bacau county) is located in the eastern part of Tutova Hills and consists of long peaks with North-South orientation and short peaks distributed perpendicularly on the main valley.

The studied area is profoundly degraded, especially due to torrential erosion, favoured by the prevailing sandy rocks, by relief characteristics, as well as by human activities.

The lithology decides slope fragmentation degree, while the inclination and surface shaping are correlated with vegetation, climate, soil etc.

Pojorata sub-basin is characterized by slopes with inclinations below 15° on the right side of the valley and in the middle and upper sectors of the sub-basin; values of 15°-25° and over 30° are registered on the left side.

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From the climate point of view, the area can be included in the forest steppe, with an annual thermic average of 9.1⁰C and an annual rainfall total of 524.5 mm.

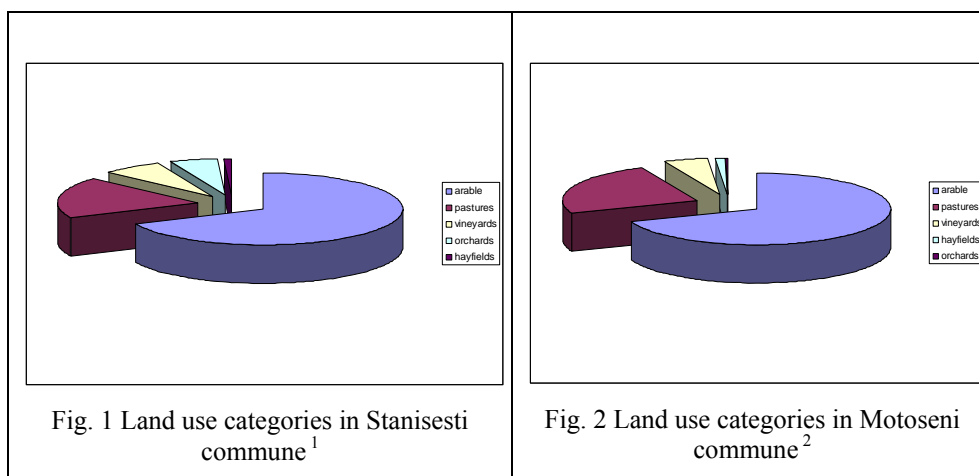
Land use and human activities

Depending on its density, consistency and species, the vegetation, either cultivated or spontaneous, herbaceous or wooden, has a direct or indirect influence on the occurrence and intensity of current shaping process.

Vegetable crops and perennial fodder graminaceae (lucerne, clover etc) offer the best soil protection, while weeding crops (potato, beet, maize, vine) ensure the lowest one.

As for stopping superficial and deep streaming, the best protection is given by the forests, especially when well structured and when they contain deep rooting species.

Land use analysis (Fig 1 and 2) shows a different distribution, both for the vegetal species and for the area they cover. Forest lack and/or fragmentation indicate that agriculture prevails in human activities, with crops being located especially in the lower part of the slopes and in the watersides of Drobotfor and Pojorata rivers.



Land covered by pastures and hayfields prevail in the basin; forests occur only sporadically; small areas covered in vineyards and orchards (sweet and sour cherry trees, pear trees etc) can be found near localities.

¹ Processed local statistic data, 2007.

² Idem 4.

Localities are placed mainly in valleys, with a higher density in the northern half of the basin (Stanisesti, Motoseni).

Brown clay-illuvial soils, which prevail in the above mentioned localities (27% and 51% respectively), are used by field crops (wheat, maize, sunflower, sugar beet, barley, lucerne, clover, soy beans, peas, beans etc), as well as by fruit trees (apple tree, pear tree, sweet cherry tree, sour cherry tree, peach tree, apricot tree), vine and vegetables.

However, productions are low. For instance, field crops yields (local data, 2007) are the following:

Crop	Yield (kg/ha)
Wheat	1700
Barley	1200
Two-row barley	1200
Sunflower	900
Maize	1400
Fodder crops	3000

Land fragmentation, lack of production factors, inadequate use of production technologies etc trigger - along with low outputs - land degradation.

Farm management

The components of each farm are combined in such a various way that we can practically state that there are not even two farms alike in what concerns area, land quality, livestock, manpower, technical-material endowment, professional training etc.

A common feature of family farms in the zone is the small size of land property, below average farm area at national level. Agriculture is the main activity of the population in this hill zone.

Farm outputs vary with the farms and according to several factors.

Taking into account the production and especially its destination, we have identified two types of family farms, namely:

- (a) subsistence family farms, which are profoundly autarchic and own land and/or livestock destined mainly to meet farm demand only;
- (b) partially commercial family farms (considered by the management as partially

open systems), represented by those production units developing both production and trade activities;

Farm development from the subsistence type to the commercial one takes place along with its enlargement. Enlargement is not to be confused with the size. The latter refers to agricultural area and/or livestock, while enlargement refers to the outputs obtained, in terms of value.

But regardless the farm type, the productions obtained by the family farms in the zone can be improved, by using measures to increase activity efficiency, which may create (or consolidate) the commercial potential of a farm.

There are numerous ways to improve the results obtained by the farms in Drobotfor basin. Some of them are shown below:

1. Farm size increase

In general, under the circumstances of current Romanian agriculture, family farm size could develop to viable, commercial farms by:

- a) selling – buying land, leading to new private properties of a size corresponding to performance technologies;
- b) association of small farmers, or land leasing by the latter, still maintaining land ownership.

In hill areas of Bacau County, the conditions are not favourable for creating viable farms through these two ways, especially due to the scattered agricultural land: a large part of it is located in the localities and are mixed with dwelling places, most often the household and the farm being overlapped on the same area, which means a considerably lower possibility of gathering this land within a single farm.

The survey carried out based on the questionnaire revealed that in Bacau hill zone there are farmer families, mainly retired, who declared themselves unable to work the land they own. There is also a certain category of land owners represented by those living in towns and who still own small agricultural areas in their native localities, areas given in the leasing system to relatives or other farmers.

2. Improvement of farm technical-material endowment

Technical-material endowment of the farms is an essential condition for a modern agriculture, capable of ensuring efficient productions, both by increasing yields and by reducing production costs.

Analysis performed on the technical endowment of family farms in Bacau County hill

zone revealed a less favoured condition; most farms have no mechanical equipment, so that production technologies rely almost strictly on manual and animal labour.

The very small size of the farms is an element which has generated and maintained this situation. It makes mechanical equipment – a tractor for instance – to be practically unjustifiable for a farm with a production structure that does not ensure proper exploitation, at full capacity; on the other hand, it is difficult for a small farm to obtain the financial results necessary for the purchase of mechanical equipment. Therefore we are in a vicious circle, unbreakable by the farmers.

3. Improvement of fruit tree varieties and of animal reproduction/breeding/exploitation system.

Fruit growing is the production branch ensuring the best economic results in hill zones; that is why we consider that the range of fruit tree varieties is one of the factors that may lead to good results in Drobeta basin. Research results can offer the fruit tree growers varieties considered to be valuable both in Romania and abroad; some are genetically resistant to diseases (scab and mildew) and require a lower number of pest control treatments, with the possibility of a 65-70% lower expenses for treatments compared to sensitive varieties.

Advantages obtained by the creation of orchards with valuable varieties, doubled by correct technologies which reevaluate their high biologic potential make possible good outputs for the private fruit growers. In the hill zone of Bacau County, old local varieties prevail for all fruit tree species, causing lower quantities and especially lower quality to be obtained.

As for the animal breeds grown in the family farms of the studied zone, research revealed that half-breeds are the most frequent in cattle, sheep are represented by breeds for rough wool, while mixed morpho-productive breeds are grown in pigs. It is typical of most family farms to reproduce the animals in their households through natural, nondirected interbreeding, as reproduction through artificial insemination is less preferred and accepted (high expenses for reproduction, maintenance and fodder).

Few farmers are correctly informed on the nutritive needs of the animals they breed, as well as on how to meet these needs, in each growing and exploitation stage. Apart from the endless love and care that peasants show their animals, most often they do not have the necessary resources to offer them the nutrition that ensures a production according to the breed biological potential. With specialized knowledge missing, tradition, intuition and experience remain the guiding elements.

4. Improvement of farmers' professional and management training

Assuming that a farm has the highest level for all the above-mentioned factors that play an important part in the improvement of production structure and results, it is obvious that their capitalization is made through the human factor, that is decisive for farm life.

Accumulation of professional and management knowledge according to current requirements creates the premises for farmer's success.

The part played by technical assistance offered to farmers has been largely debated in specialized literature. Local and county agricultural centres, A.N.C.A. etc can intervene by specialized technical consulting and many other ways to help the farmers, such as:

- periodical update on the offers for pest control products, chemical fertilizers, agricultural equipment etc, as well as on the selling prices for agricultural products on local and country markets;
- support in ensuring high quality seeds and reproductive material;
- courses for farmers' informing and training;
- co-operation with local media (local radio stations, TV, press) for broadcasting information useful for farmers.

It is important though that measures be applied, and that the activity of the centres be seen by the farmers as a real and indispensable support for solving any farm issues.

5. Development of activities complementary to agricultural ones

In the current social-economic situation, non-agricultural activities (servicies) are carried out, to obtain alternative incomes, to create new jobs, to rationally use natural resources.

Recently, conditions required by the development of rural tourism and agritourism have been created in Romania.

Also, domestic tourist demand has changed in the last few years, so that there is a higher interest in agritourism compared to the classical tourism, especially with the lower financial power of a large part of country population.

Practising agritourism in the studied zone is a good chance for the farmers, a real alternative both for the farmers - due to larger income from tourists' accomodation and from the capitalization of their own farm products (which are no longer transported to city markets, thus saving transport and selling costs) - and for local economic-social development.

Being so complex, agritourist activity can contribute to the general development of the respective rural zones, through local economic activities (e.g. meat, milk, honey processing) to meet a higher demand for agricultural and non-agricultural products.

Conclusions

Ever since its creation, human society has influenced nature through the various use of its resources. At present one can say that human activity is comparable to the one of the main shaping agents, with the difference that it can concentrate in some areals, generating important changes, especially through deforestation and agricultural use of the land.

A closer analysis of the natural conditions in Drobotfor hydrographic basin reveals that, apart from the direct effect of lithology, relief, vegetation and climate characteristics on the geo-morphological process, the latter is also significantly influenced - directly or indirectly - by the human factor.

Grazing and forest exploitation modify relief shaping regime by: soil erosion and destruction, herbaceous vegetation destruction, sudden change in water regime, massive soil washing through ravines, soil degradation through erosion and land slide.

Countermeasures are recommended against torrential process, as well as against mass displacement: bank reinforcement and protection, torrent control, forest plantations, rational grazing etc.

Measures for a revision of agricultural land use categories are recommended, depending on the degradation process (moisture preservation, erosion etc). Considering the specific pedoclimatic conditions allowing the development of a rich and various melliferous flora, improvement of floral composition is suggested, for a higher natural potential.

The best use of natural soil and sub-soil resources, labour resources and population distribution will ensure a permanent balance between their capitalization and the protection conditions necessary for the sustainable development of the territory.

Measures for a better quality of the natural environment are also necessary in Drobotfor hydrographic basin, as well as for the ecologic recovery of the territories strongly affected by human economic activities or by destructive natural phenomena, especially the rehabilitation of the degraded zones and the protection and conservation of natural values.

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УПРАВЉАЊЕ ПОЉОПРИВРЕДНИМ ЕКОСИСТЕМОМ СА ОДРЕЂЕНОГ ПРОСТОРА СТУДИЈА СЛУЧАЈА - ВАСЉУ

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Резиме

Пољопривреда се тренутно налази под утицајем новог типа економије и Европских структурних интеграција. До тада, пољопривреда мора бити препозната као важана грана националне економије из разлога што људи имају потребу да једу и из разлога што се у свету промовише само-прехрана, и позитивни комерцијални баланс. Дакле, ипак се треба угледати на принципе тржишне економије, укључујући и сталне адаптације у току реформе економских основа пољопривреде. Да би се то постигло, неопходно је донети нове законе у пољопривреди, модернизовати сеоску инфраструктуру и заштитити екосистем кроз очување и побољшање функционисања аграрно - прехранбеног ланца.

Кључне речи: заштита екосистема, сеоска инфраструктура, европске структуре

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