



High nature value farmland of EECCA subregion

Vision of the experts of the European ECO-Forum from the subregion countries

Done within the project *Identification of High Nature Value (HNV) farmland*: support to non-EU accession countries, implemented by UNEP ROfE in cooperation with European ECO-Forum. Supported by the Governments of Norway

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NOTE: The vision is based on very scarce official data and derived evaluations, materials and opinions of experts and received them personal communications, as well as the scanty information available from published sources. Nature of all this information prevents mainly the direct referencing in text, while list of references was fully dependent on experts personally.

Summary. The Vision of experts of the European ECO-Forum from the EECCA subregion on the High Nature Value Farmland (HNVF) introduces project of classification of these areas (4 types and 23 kinds), based on ecosystem approach. It proposes a definition for HNMF that is linked with criteria and features of high biological and landscape values. The document contains examples of criteria linking HNMF with criteria of ecological networks and Important Bird / Plant Areas and proposes a system of indicative features that embraces biological as well as social issues. Different methodological problems are discussed. Some special HNMF kinds as lands under agro-environmental schemes and less-favored lands that are important in EU support for sustainable and extensive farming are not applicable for the region currently due to the lack of information systems and agricultural policies. In general, EECCA HNMF play underestimated part in biodiversity conservation and support very many species threatened at global, European and national scales. At the same time HNMF produce the main part of livestock products in that space. Estimated share of HNMF varies from 3 up to 50 %, usually 20 % in the land use of different countries while share of protected ones varies from 2% to 45 %. As special category the HNMF is absent in official documents of the sub-region countries, where official implementation of the Kiev resolution (2003) did not take a real advance regarding agrobiodiversity. Except Belarus and Russian Federation, the state of HNMF is assessed mainly as unsatisfactory and current trends considered as negative. Political, economic, social-economic reasons and other factors determining the HNMF conditions are summarized. The vision incorporated recommendations for decision-makers, international organizations (as donors, bodies of international law, etc.) and NGOs. The recommendations include: reasoning the significance of HNMF for sustainable rural development and linked activities; analysis of threats; directions and obstacles of management for conservation and sustainable use of HNMF; strategic and tactical tasks, recommendations and practical suggestions for conservation and sustainable use of HNMF. Case study in Moldova has allowed making more precise estimations, testifying some methodological issues and identifying many HNMFs.

Acronyms

BCL	Bern Convention List
BDAP	Biological Diversity Action Plan
CEB	Central Environmental Body
EEA	European Environment Agency
EECCA	Eastern Europe, Caucasus and Central Asia region
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
IPA	Important Plant Area
IBA	Important Bird Area
IUCN	The World Conservation Union
LFA	Less favored areas – a socio-ecological class of HNMF
LEN	Local ecological network
PA	Natural Protected Area
PEBLDS	Pan European Biological and Landscape Diversity Strategy
HNMF	High Natural Value farmland
CA	Central Asia and Kazakhstan in the biogeographical context
LAS	Lands under agri-environmental schemes – a socio-ecological class of HNMF
ECO-Forum	European Forum of Environmental Organizations
UNEP	United Nation Environmental Program
CR	Critically endangered species
EN	Endangered species (IUCN classification)
VU	Vulnerable species (IUCN classification)
LR	Low risk species (IUCN classification) – species under a low danger to extinct
DD	Species with data deficit to identify a risk category (IUCN classification)

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Introduction

Under the term “high nature value farmland” (further - *HNVF*) there are understood the areas maintaining substantial natural biological diversity, conserved within *farmlands* or *due to former agrarian use*, as well as territories that have a value as the genetic reserve¹ for farmlands.

Biodiversity losses in many farmlands is in a great extent the result of the continuing decrease of the traditional, extensive and mixed agricultural practice, its intensification or the land abandonment in some regions.

The participants to the “High-Level Pan-European Conference on Agriculture and Biodiversity,” organised by the Council of Europe with UNEP and the French Government, in Paris in June 2002, recognized these trends as well as the high value for society of the conservation and sustainable use of biological diversity on agricultural land. Wildlife diversity, genetic diversity of agricultural species, varieties and breeds, and the life support functions of biodiversity, wisely managed in the wider context of sustainable agriculture and rural development, serve people in rural areas, consumers of agricultural goods and services, as well as society at large. They therefore recommended, *inter alia*, the further identification of high nature-value (HNV) areas in agricultural ecosystems in order to apply biodiversity-sensitive management by means of rural development instruments, especially agri-environmental programmes, and to support their economic viability in order to prevent land abandonment.

The official Parties of the Fifth Ministerial Conference “Environment for Europe” (Kyiv, May 2003), signed the Kyiv Resolution on Biodiversity presented by the Council of Pan European Biological and Landscape Diversity Strategy (PEBLDS). The ministerial resolution notes despite previous efforts, the continued degradation of biological and landscape diversity in the pan European region and *recognise* that the continued loss of biological and landscape diversity will undermine sustainable development and the social and cultural integrity of the Earth’s populations. In this connection the **Ministries** reinforced the objective to halt loss of biological diversity and to achieve important key targets. **In the short list in nine such aims two ones are dedicated to agrobiodiversity:**

By 2006, the identification, using, of all high nature value areas in agricultural ecosystems in the pan European region will be complete. By 2008, a substantial proportion of these areas will be under biodiversity-sensitive management by using appropriate mechanisms ..., to *inter alia* support their economic and ecological viability.

By 2008, financial subsidy and incentive schemes for agriculture in the pan European region will take the conservation and sustainable use of biodiversity in consideration.

However, unfortunately, it is already evident that aim-2006 has not achieved, due to financial difficulties among other. It is necessary also to note that HNVF identification is bounded up with forming the Pan European Ecological Network that is a subject of the Kyiv Conference’s special statement. This proceeds both from the ecological network concept itself (documents of the PEBLDS **STRA-REP (98) 6 rev. 5** и **STRA-REP (98) 20**), and from the idea about a nature basis for its implementation – the physical and biological characteristics of landscapes and individual biotopes.

¹ Words “genetic reserve” define localities where the prominent wild populations of rare species remained that became a base for the selection of new cultural plant and domestic animals, the plots of vegetation applicable to generate a seed material for ecological restoration, the entomologic microreserve, as well as the territories, from which reintroduction into former species habitats is possible.

In 2003, the European Ecological Agency (EEA) carried out a pilot study to identify the HNVF distribution in 15 EU countries. Results of this work are summarized in the joint EEA and UNEP report (see http://reports.eea.eu.int/report_2004_1/en). However, the study should be in progress both as from the viewpoint of its essence well as extension on other countries of the pan European region. Norway Government support has provided with the start opportunity to begin this work for Eastern Europe, Caucasus and Central Asia (EECCA) countries.

All above-said is boring words. Nevertheless, experts of the European Forum of nongovernmental environmental organizations (ECO-Forum) realize the real significance of HNV farmlands to conserve natural recourses both in their countries and over the entire pan-European space that maintain splendor of life becoming vulnerable more and more. Therefore, the project's participants would like to deliver its results to decision-makers who are responsible to the society for their decisions. Correspondingly, the public should receive access to information directly relating to everybody who intends to live and bring up children.

European Environment Agency's (EEA) report about agriculture and environment in the EU accession countries (EEA, 2004) concludes that a few data are available to document clearly the tendencies in biodiversity appearing in response to agricultural changes. As to the huge area of new independent states, the task is more complex because data accessibility is still lower here, but the territory is multiply spacious.

A term '*high nature value farmland*' has appeared in West Europe where HNV farmlands are presented as specks into agrolandscapes, although the *lands under agri-environmental schemes (LAES)* and *the less favored areas (LFA)* -- HNVF classes in the below proposed classification -- create sometimes the vast zones. In the significant part of EECCA subregion, concerned with nomadic cattle-breeding as well as with ancient farming, for example in Mid Azia, HNV farmlands can make up the main part of the territory of corresponding countries. The reasonable classification of HNVF allows showing their diversity and emphasizing the critical hazards to biodiversity, and the availability of much less large, although uncertain, proportion of economical classes -- the possibilities to implement the purposeful economical mechanisms.

A HNV farmlands notion is indispensable bounded up the definition of a *significant* diversity. In this context the word 'natural' signifies that value is not determined by varieties of cultural plants, domestic animals breeds or decorative compositions from natural flora, fauna or introducents representatives.

A HNV farmland matter proceeds from the conception that high natural value is determined by a level of natural biodiversity and the special significance of landscape when this significance is concerned organically with a biotope's characteristics determining biological richness. Here the 'biodiversity' concept is used in accordance with the definition of the Convention on Biological Diversity (art.2)²; the 'landscape' concept -- with the approach (preamble) and definition (art. 1)³ of the European Landscape Convention.

² Variability of living organisms from all sources, including...ecosystems and ecological complexes, whose part they present, ... diversity within the species, among species and ecosystems diversity.

³ «Landscape» signifies a certain space, how peoples distinguish and identify it, and whose pattern is the result of action and interaction natural and/or anthropogenic factors.

This means that HNMF definition must be based on the determination of a certain level of natural biodiversity and the features allowing considering a landscape or its part as especially valuable.

Among HNMF, irrespective of a property form, there are either territories or their parts (along with small waters and lands with transitional patterns) protected by national legislation, and locations that are not under protection of governmental and public authorities at present. It is possible that this maxim looks as needless. However, the experts discussion cleared up necessity to elucidate that HNMF may be either officially recognized or unprotected natural area as well the part of the former. This means also that a Natural Protected Area (PA) is not the only possible category of legally protected areas that have high natural value, or that such a category could be introduced.

Obviously, there is no single definition of HNV farmlands. Differences in views are inevitable even in the region with regard to which the assessment is carried out now. This problem is traditional for many concepts and there is the only proved method to solve it:

- (a) to focus the items that do not provoke surplus discrepancies;
- (b) to accept the more developed point of view, in spite of its visible weak points; and
- (c) to rely on an expert in a narrow question or from the discussed country, if his judgment doesn't contradict to principal ideas.

There are doubts about principal possibilities to create a HNMF comprehensive definition that could be equally applicable for entire pan-Europe. In the discussed space, there are no discussions on HNMF definition, and we may spend no efforts to uphold our viewpoint now. There are no such comprehensive definitions for a few complex conceptions. It may be just therefore the biological science, which is more inclined sometimes to scholasticism than to theory, includes quite many definitions. In reality, the terms without references to generally accepted definitions are used in the biological theory successfully. A correct general definition is obligatory only for a hypothesis postulation and the proof of a theory (and than the concept is constricted to the highest degree); however, historically, this product has quite often no easy fate. Thus, the cited below definition could be considered as a reference point.

Definition. *High nature value farmlands* are lands (including of forest and water funds) and territorial-water formations within the lands of predominately agricultural destination where *the high biodiversity* is conserved and/or formed as this is testified by assessment *criteria* (criteria systems) and/or by *features* of a particularly valuable or unique *landscape*, forming the special conditions for existence of ecosystems, communities and species.

This definition comprises indication of item of value properly (high biodiversity), but also of means to reveal it. Avoiding hopeless attempt to squeeze the complex meaning into single paragraph in understandable manner here is suggested to connect hardly the notion with (a) criteria of biodiversity assessment (that is quite reasonable!) and (b) indirect feature – landscape characteristics indicating special conditions for biodiversity.

The last circumstance is important both from the standpoint of linking the biological and landscape diversities and from position to apply CBD Precautionary Principle. For example, a territory of virgin steppe is ought to be protected without special floristic and faunal investigation although it is desirable from managerial point of view.

Thus, HNV farmland can be considered as a variant of an ecological network's core area (irrespective of its size above some minimal threshold) concerned by its location, history, origin and forming factors with the countryside and agrarian activity in the most general meaning of this word.

Under 'countryside' one understands the area that contains among the other the following objects of nature management:

- Forest enclaves under strong influence from agrocoenoses, rural population and its activities, including grazing and haying;
- So named 'wild' steppes;
- Small inner water bodies and pond systems that are used for fish-farming and fishing as well as the favorable for wild flora and fauna landscape that they form;
- Hunting grounds outside a forest fund;
- Locations serving as monuments of the medieval agriculture.

HNV farmland can be a core area of any range: core area of a local ecological network; core area of the local-, national- or international level of a national or pan European ecological network. This does not mean that another element of ecological network (e.g. biological corridor corresponding to the same criteria) cannot be considered as HNVF. In large zones where pastures are main land-use, the *intensively* used or simple croplands are found within HNVF. In such zone borders, low-disturbed lands may correspond to HNVF definition and have meaning of a buffer territory regarding as to the core area – the place of concentration of rare and other species.

1. PROJECT OF CLASSIFICATION of high nature value farmlands

1.1. Ecosystem classification of HNVF

Conform to above suggested definition, biotopes and combinations of biotopes forming a landscape pattern are among HNV farmlands if their biological value is determined by the flora, fauna and ecosystems composition as well as by the attributes of an especially valuable landscape.

Main types of biotopes:

1. Enclaves, spacious areas, or their parts, of the ecosystems of natural and semi-natural herbaceous vegetation:
 - 1.1. Steps and stony steps that preserved domination of primary edificators – the most important and widespread HNVF type in the subregion, supporting many species of rare plants and animals (Imperial Eagle *Aquila heliaca* – CR, Lesser Kestrel *Falco naumanni* – VU, Great Bustard *Otis tarda* – VU, Little Bustard *Tetrax tetrax* – NT, Sociable Lapwing *Vanellus gregarius* - CR; Argali *Ovis ammon* (VU), Spotted Sousek *Spermophilus suslicus* (VU), Steppe Pika *Ochotona pusilla* (VU), Grey Hamster *Cricetulus migratorius* (LR/nt), Pallas Cat *Otocolobus manul* (LR), Goitered gazelle *Gazella subgutturosa* - LR⁴, Meadow viper *Vipera ursini* – EN) etc).

⁴ Category LR is used here in the extended meaning including NT Category.

- 1.2. Plain meadows with dominating formations of typical meadow species – wetter herbaceous communities, spread in the South mainly in over-moistened habitats or along watercourses; in the boreal zone – on watersheds as well (Great Snipe *Gallinago media* and other rare species of sandpipers, Corncrake *Crex crex*, storks, herons; in the semidry landscapes – Pallid Harrier *Circus macrourus* – LR and other);
 - 1.3. Alpine meadows with a natural pattern of vegetation structure – the mountainous variant of meadows; in Central Asia and Caucasus they forms a peculiar input into the composition of endemic plants and mountain ungulates (Urial Ovis *Ovis orientalis vignei*– EN, Tien Shan Argali *Ovis ammon karelini* – VU, Tadjikian Marhor *Capra falconeri heptneri* – EN);
 - 1.4. Deserts and semi-deserts – in the region they occupy main part of Central Asia where many rare vertebrates inhabit (Asian Cheetah *Acinonyx jubatus venaticus* – CR, Asiatic Wild Ass *Equus hemionis* – VU, Saiga Antelope *Saiga tatarica* - CR, Central Asian Tortoise *Agrionemix horsfieldii* –VU, Asiatic Cobra *Naja naja oxiana* – DD), but penetrate also into Russia and Caucasus (Dahl's sandpiper - Dahl's Jird *Meriones dahli* and other);
 - 1.5. Native bogs, which are preserved due to a special regime of ground water; they are used by many species that lost habitats in lowland agrolandscapes mainly or partly (Aquatic warbler *Acrocephalus paludicola* – VU, Great snipe *Gallinago media* – LR, European Pond Turtle *Emys orbicularis* – LR, Medicinal Leech *Hirudo medicinalis* – LR);
 - 1.6. Particularly valuable and reference soil plots where many species of microflora and invertebrates are usually preserved (habitation of endangered narrow endemics is highly probable here), vanished in croplands and pastures as a result of overgrazing, chemicals and tillage.
 - 1.7. Reindeer tundra – the most preserved natural pastures maintaining the entire attendant complex of plants and animals (rare goose species);
 - 1.8. Digressive, or specific pioneer ecosystems maintaining the valuable components of biodiversity (rare insects, sometimes endemic plants);
 - 1.9. Areas of alkali soils of the natural origin – serve sometimes as habitats of species with specific demands (Ararat Cochineal *Porphyrophora hamelii*), many water sandpipers as above mentioned Sociable Lapwing *Vanellus gregarius* - CR, or refugium for flora and fauna representatives that lacked their native habitats and capable to survive here.
2. Wetland ecosystems formed by land-improvement activities due to natural parameters of the territory:
- 2.1. waterlogged places with natural development trend including those that appear as a result of the abandoning the previously reclaimed lands; they play a part of natural swamps and corresponding fauna uses these (European Tree Frog *Hyla arborea* – LR);
 - 2.2. kiarizes [traditional underground collectors of waters in desert foothills], combined with the surrounding oases and (sub)natural biotopes – enable to support many plant and animal species of dry ecosystems; the underground systems are directly inhabited by reptilian and bats as Mediterranean Horseshoe Bat *Rhinolophus euryale* – VU and European free-tailed bat *Tadarida teniotis* – LR;
 - 2.3. mill-ponds in surrounding of (sub)natural vegetation that are used by many plant and animal species, including rare ones (Common Otter *Lutra lutra* – LR);
 - 2.4. Biologically rich sub-natural ecosystems that are formed as result of creating and functioning the hydro-technical systems (including pond and drainage systems, channels, etc.) (*Haliaeetus leucoryphus* – VU, Small Cormorant *Phalacrocorax pygmeus* – LR, Ferruginous Duck *Aythya niroca* – LR, Southern Damselfly *Coenagrion mercurialis* – VU, European Mud-Minnow *Umbra krameri* – VU).

3. Enclaves⁵ of natural and semi-natural tree and shrubby vegetation (including savannas-like ecosystems), preserved in agrolandscapes):
 - 3.1. Plain forests that keep capacity for natural succession – the ecosystems playing especial role. Being situated among farmlands, they give reproduction opportunities for species that use fields seeking a food (Greater Spotted Eagle *Aquila clanga* – VU, Red-Footed Falcon *Falco vespertinus* – NT as well as for the true forest species (capricorn beetle *cerdo* – VU и *Morimus funereus* – VU);
 - 3.2. Mountain forest and shrub formations **mainly** of indigenous composition that include rare species (Darvasian Dogwood *Swida darvasica* – CR and Sievers' Apple-tree *Malus sieversii*) and are used by many rare species (Rosalia Longicorn *Rosalia alpina* – VU, Menzbier's Marmot *Marmota menzbieri* – VU, Snow Leopard *Uncia uncia* – EN);
 - 3.3. Hollow forests, associated with the complicated relief forms (Forest Dormouse *Dryomys nitedula* – LR);
 - 3.4. Flood-land forests and shrubs of composition pertinent to a watering regime (Bechstein's *Myotis bechsteini* – VU and Pond Bats *Myotis dasycneme* – VU, and Giant Noctule *Nyctalus lasiopterus* – LR);
 - 3.5. Particular forms of tree-shrubby vegetation that are formed due to different variants of traditional hewing or slash-and-burn use; they form a peculiar landscape and are used by many rare species.

4. Biotopes, which origin is bound up with rural activities (sometimes ancient or special):
 - 4.1. Fruit and nut forests irrespective of their origin (there are different versions – on natural or artificial genesis) are parts of mountain ecosystems and habitats of wild plants and animals; however, they have own value as the gene funds of wild fruit and nut species (Vavilov' Almond-tree *Amygdalus vavilovi*, Pistache *Pistacia vera*, Pomegranate *Punica granatum*, Fig-tree *Ficus carica*; *Pyrus korchynskyii*, Niedzwetzky' Crab Apple Tree *Malus niedzwetzkyana*, etc.)
 - 4.2. Ancient and very old orchards that enable to conserve own aspect for a long time – the peculiar ecosystems attractive for birds, reptiles and blossom-using insects; often herbaceous cover includes medicinal plants, while fruit-trees kinds and forms that become rare are found here being media of threatened gene pool;
 - 4.3. Local systems of forest belts that form ecosystems capable to long-term existence, including the protective plantings along dams, channels and other reservoirs, if their value is not defined as objects related to subtype 2.5 (Imperial Eagle, Red-Footed Falcon *Falco vespertinus*, Eastern European Hedgehog *Erinaceus concolor* – LR, steppe bumblebee *Bombus fragrans* – one of the most rare hymenoptera species in the steppe zone, while in desert conditions - Houbara Bustard *Chlamydotis undulata* – LR);
 - 4.4. Ecosystems formed as a result of terracing and covered by indigenous, especially herbaceous and shrubby vegetation in significant degree – peculiar forms of anthropogenic landscape where plants and animals – inhabitants of semi-open biotopes, including rare snakes, insects and so on – are met;
 - 4.5. Vigorous ravines systems and slope territories with the actively developing landslide processes and ravines erosion, covered mainly by different type of vegetation; they form sometimes the specific forms of landscape with hard-to-reach parcels and with various moisture conditions allowing the conservation of wild life (including vulnerable species) that are forcing out of lands under agroproduction.

⁵ See below *Problem 1*.

1.2. Attribution to HNVF, concerned with the specialized systems of their selection and account as well as with socio-ecological management

There are problems concerning what can be attributed to potential HNV farmlands of various nature; lack of data for analysis and conclusion unites these problems.

Problem 1. What may be considered as an enclave? The simplest example concerns forests. Small forests inhere in agrolandscape often. This especially relates to forest-steppe regions and remainders of flood-plain forests, preserved in valleys of large rivers after the transformations. However, it is difficult to delimit between enclave and purely forestland. Moreover, quick destruction and fragmentation of formerly entire forest ecosystems take place in some regions (for example, Uzbekistan).

The problem does not touch upon grassy biotopes that are predecessors of plough-lands or used for grazing. Probably, the same could be said about savanna-like ecosystems that are widely spread in Central Asia and, in a less degree, in Caucasus. Stand density varies here up to curtains and individual trees but grass cover is under grazing.

Problem 2. Is it necessary to include digressive variants (for example, secondary/tertiary formations with the quite turned out complexes of species) or pioneer (for example, confined to the slide-rock or avalanche slopes) ecosystems into the HNVF? HNVF concept determines the answer – yes, it is necessary if these plots correspond to criteria, e.g. support a certain number of rare species or, at least, one species of the IUCN Red List and category not less than vulnerable species. It is clear other variants are possible.

Problem 3. It is possible that some specific HNVF kind is already lost in a country as of kiarizes in Uzbekistan that maintained the some target species or flora (fauna) oasis. Should we exclude such HNVF kind? We suppose, it ought to be described as the vanishing or disappeared type that maintained such-and-such rare species and a specific landscape (in the Convention definition). Such vanishing or disappeared HNV farmlands are the following in some countries: 2.2, 2.3, 3.4, 4.1 and 4.2., and possibly some other subtypes.

Problem 4. Criteria basing on the role of habitats for flora and fauna maintenance are likely applicable for HNV farmlands of the type 4; however, they can have an independent landscape value. In this connection, perhaps, a certain feature of weak (moderate) disturbance or, on the contrary, complete abandonment has a paramount importance for estimating the HNV farmlands of the subtypes 4.1 and 4.2. A criterion of particular silviculture as regards to efficiency of existence and self-maintenance may be applied for subtype 4.3; while criteria of peculiar landscapes – for the types 4.4 and 4.5.

Problem 5. Suggestions on the criteria and indicators for attribution to the HNV farmlands may be linked to HNVF classes that are known under names:

- lands under agri-environment schemes (LAES), that may be connected with disuse of genetically modified organisms, limitations in use of pesticides or organic agriculture properly, limitations of livestock or diminution of diffuse pollution; and
- less favoured areas (LFA), where abandonment would lead to destructions of a combination of natural features and those turned out during agricultural use that are favorable for biodiversity, as well as to social problems; low profitability of these lands is not determined by deficit of investment or technologies.

The need to develop the specialized systems to register the lands of such classes causes a necessity to rely on the selection of features used for accounting of the land-use quality and monitoring of ecological policy.

Possibility to apply such HNV farmland categories, based on experience of the West Europe, causes great doubts with respect to areas of the EECCA subregion, at least at present.

Such or similar land categories are absent in the legal system and, especially, in the practices of the subregion countries. Their identification could be only recommended in that or another form, in the course of differentiation of tax system, including in connection with production of ecological products (that is insufficient in itself). Stimulatory measures for HNVF conservation beyond the fiscal system (based on additional payments and compensations only), are low likelihood in socio-economical situation of the most countries of the region, and more available in countries that export energy resources.

What territories could be attributed to LAES and LFA in countries of the subregion under study?

LAES likely, is more universal class of lands from the viewpoint of the geography of possible use of indicators. Sustainable soil-protecting farming (the first negative indicator of the class) is poorly spread in the region that cuts the main part of lands from this class. As evidence, the statistics on distribution of main crops (Moldova, Uzbekistan and other) shows the mass absence of true crop rotations.

The indicator (the positive indicator-1a) of such crop rotations is share of perennial legumes not less than 15-20%⁶.

Other lands are mainly managing intensively (the negative indicator-2).

Indicator of soil-protecting farming (the positive indicator 1b) is subsurface tillage (using soil-cutter). This technology is relatively spread in Kazakhstan and Russia, but stopped in Moldova. Nevertheless this technology does not signify the farming with features of extensive. Moreover, usually it requires application of herbicides with the different levels of danger.

Thus, only the lands where primary agri-production is certified as ecological or medical (positive indicator-2) can be attributed to LFA. Due to the increasing segment of market of the organic products, support (most likely – indirect) for such production could be expected in some countries (Armenia, Georgia, Moldova and Russia).

The external indicator (positive–3) of possibility to attribute a territory with prevailing farming to LAES is the presence of forest, grassy, shrubby and combined belt systems of different destinations that support organisms important for agroecosystem stability and favor the local migration and structural diversity of biotopes.

The external negative indicator-3 is the case when an alien species creates association of a green belt, or the aggressive plant species (for example, American Maple *Acer negundo* or Locust-tree *Robinia pseudacacia*) are introduced artificially into it. Such situation is, alas, quite widespread in the region's southern part.

Problem 6. Evidently, the small lands with ecological production are ingrained into agrolandscape and incapable to maintain increased biodiversity. (Its principal components are soil biota, entomophagous insects, pollinators, spiders and so on, as well birds and small terrestrial vertebrates).

⁶ Among field crops, the perennial legumes are the only forming ratio of plant under-ground/above-ground parts that is capable to maintain some balance of organic matter in soil, fitting it from clearly negative values to zero. Other cultures remove organic matter much more than accumulate. The same legumes are the main accumulators of the air nitrogen. Compensation of organics removal at the expense of significant use of mineral and organic fertilizers is one of variants to use a great part of nonrenewable fossil resources.

That means that a certain minimal threshold area may be introduced as HNMF attribution criterion for LAES. However, solution of this problem requires a study, based on real data.

Note. Perhaps, LAES as the land class is slightly overlapped with the lands that could be attributed to some kinds of HNMF ecosystem classification. Most likely, the overlap relates to 1.1–1.4 and 1.8 HNMF subtypes where the ecologic production of pasture cattle-breeding products can take place. For the present, it absents in Armenia, Kazakhstan, Moldova, and Russia, although *de facto* animal products from many outruns in Georgia, Kazakhstan and Tajikistan would be considered as the “ecologic” if neglect questions of stock-keeping cattle and slaughter. A part of flood-plain and dry-value meadows can be considered as such lands in Belarus and Russia. The overlap concerns HNMF of subtype 4.1 also (Kyrgyzstan, Tajikistan).

One may say, that LFAs are simply the lands where extensive agriculture is supported due to social motivation and food security, or preserved spontaneously owing to socio-economic situation while intensive production is low probable because of economic factors (a low investment return). So, entire agrarian part of Sweden had been attributed here.

Many lands of EECCA countries could be potentially attributed here, for example, Uzbekistan non-irrigable lands (boghara) in their current state, most Moldova farmlands, and lands in Kazakhstan, Russia and Ukraine rural areas where the flow-out of populations takes place because of economic causes and agricultural activities decrease.

However, the same indicators of the land class are applicable for LFA as for LAES. These indicators limit significantly the HNMF potential area within LFA because of destructive style of the extensive agriculture that results not only in small yields, but also in the loss of organic matter and the washing-out of soil fertile layer. Moreover, it is difficult to attribute the abandoned lands to HNMF, overgrown in the course of forest succession (agriculture sense losses), or formation of weedy fallow lands especially where gene resources are not conserved to be source for self-recovering of sub-natural grassland ecosystems.

Two likely indisputable LFA variants that correspond to HNMF concept are raised: (1) the lands under complex traditional sustainable extensive production; (2) arable or other lands transferred for restoration of sub-natural herbage because of degradation danger due to erosion, salinization and over-wetting, or due to economic causes.

Note. Variant-1 is connected with the long-term settled way of life that is hardly kept anywhere in the subregion countries except distant mountain regions; in some countries it was whether. Apparently, variant-2 is very low spread in Moldova, Ukraine, and CA (besides Kazakhstan). Hither, for example, the lands under the methods of agri-steppe reconstruction (the use of seed and sometimes vegetative material from steppe plots) or complex grassing (using seed sets of herbaceous species growing both in the culture and wild) can be attributed.

Thus, the next conclusions can be done:

A. Lands that are acceptable to be considered as being under agri-environmental schemes or under low-favor farming and, simultaneously, those do not contradicting to HNMF indicators of these classes:

- 1) do not present any vast area in most countries at present;
- 2) are low overlapping with lands that correspond to HNMF ecosystems classification, and this overlap is significantly lower than in the West-European countries;
- 3) can be significantly widened in the case of successful socio-economic development of the subregion’s countries in future;

- 4) may receive an especial support from the governments in the case of special development programs with targeted financing only;
 - 5) EU programs of good-neighborliness as well as other big donors can contribute to the widening of HNMF socio-ecological classes.
- B. Existence of HNMF classes itself shows that thresholds (in criteria and features) that should be suggested for determination of high natural value cannot be very high. However, that is the theme for special study that is necessary.

1.3. Relationship of HNMF classification and criteria

The classification of HVL farmlands is the classification of lands that can be these lands following to features of the classification itself, to be considered as the probable HNV farmlands. For example, *a swamp (the classification feature), conserved in an agrolandscape, but not a village, can be attributed to HNMF in case of correspondence to criteria or features of value.* A question concerning the classification may be heard so: Where (to what taxa of given classification) some HNV farmlands can be attributed?

A question “*Does a territory corresponding to the classification relate to HNV farmlands, or this status cannot be given it?*” is a question of criteria.

In “applied ecology” an “expert judgment” is used instead criteria because the latter are difficult to pick out sometimes, or there is no habit, skill or desire to formulate rules often. One may say that the expert judgment is assessment using rules that were turned out in the expert’s vision, but not been clearly formulated and poorly systemized usually. It is known that ‘by-eye’ estimations are as if found the logarithms and ranged (on physiological level) in the limits of individual capacities for inner information perception.

A question about criteria would look so, – Whether some habitat (biotope, locality station, or ecosystem) corresponding to a certain taxon of classification could be attributed to HNV farmlands?

Note. The notion about HNV farmlands (neither definition nor criteria are taken in the mind here) was developed in the Western Europe on the base of study of lands attributed to «less favored areas» (LFA) (see: http://reports.eea.eu.int/report_2004_1/en). This study showed LFA are more favorable from the viewpoint of biodiversity than other farmlands.

However such lands present an economic category in the EU agricultural policy. Correlation of biological conclusion with an economic category results in transforming of LFA in the individual class of HNMF where a biological value presents (absents) with some probability but not necessarily. The “lands under agri-environment schemes» (LAS), e.g. for ecological production, are the same class.

Thus, LFA and LAS are not the taxa of HNV farmland classification. Their “high natural value” is relative. As a rule it is significantly higher than value of lands with intensive agroproduction, but only small part of such lands is attributed or can be attributed to «Nature-2000», or estimated as core areas of high level.

In order to avoid mishmash, *LFA and LAES* are named here *the classes of socio-ecological economics.*

2. METHODOLOGY

2.1. Principles, criteria and features for attribution of lands, corresponding to ecosystems classification, to HNV farmlands

Overall, principles, criteria and features are necessary to confirm biodiversity value and attribute lands to HNVF, basing on an ecosystems approach.

In the conditions of deficit of systematized and ranged data on concrete biodiversity parameters (a number of main taxa and protected species, indicators of species richness and relative diversity, etc.) some principles containing the features of value are used usually to determine the biologically valuable territories.

The first principle is the selection of ecosystems that are minimally disturbed or with moderate level of transformation (*feature*) and sufficiently large areas (*feature*) that are not liable to a regular economical activity (*feature*) and, often, maintaining the high richness of flora, fauna and ecosystems (*feature*). The limitations to use the principle are a little: it is hardly applicable on the background of vast and almost undisturbed areas, or of total land transformation (in the antipodal conditions).

For large-scale assessment and/or planning, this principle is applicable both in the extremely changed landscapes of Moldova (Portugal) or in the South of Ukraine (France), and in the moderately transformed regions of Kazakhstan, Russia and Uzbekistan (Germany, Czech Republic).

It is not clear whether it is available in the conditions of poor nature not including its own typical components.

Note. The principle application causes difficulties in transition to smaller scales since the risk of incorrect intuitive assessment of features with relative characters increases. The problem arises when it is necessary to measure or quantify disturbance, size, regularity of activity and richness of biodiversity components. This task can be solved only with the help of criteria establishing the reference points and thresholds values for the assessment.

The second principle – presence of a significant contribution of a territory into maintenance of biodiversity as it is determined by the features of biological value. The distinction of this principle from the previous one is in basing on concrete data about the presence of that or other species but not on their probability.

The third principle – assessment of territory's input into landscape diversity that has own significance and encourages conservation of flora and fauna within the large territorial zones (e.g. zones of soil degradation or unsustainable or intensive agriculture). The principle is fulfilled with help of considerations on structural and qualitative landscape features such as characteristics of relief irregularity (in the case of large ravine systems), peculiar geological genesis (in the case of «hyrtopes» and likely of «mud volcano» and other), or presence of especially valuable geological cuts and outcrops.

The fourth principle – assessment of uniqueness of HNV farmland subtype and potential role in the advertising and other public ***information support*** for conservation of (a) biological and landscape diversity as well as (b) development in different directions (agro- and ecological tourism,

differentiation of taxes and legal provisioning) that all embed adequately the conservation idea into economical systems.

The fifth principle – assessment of the land development perspectives from the viewpoint of biodiversity conservation (loss), sustainable use of natural resources and social development (present and potential economical value). HNMF identification is an ecologic-political instrument connecting nature protection with economy, but not with the widespread in EECCA countries idea of absolute reservation, or ignoring the un-monetary values of nature resources.

1. Features of biological value:

- 1.1. ***Natural richness of native «local» species;***
- 1.2. Absence (minimal presence) of alien species;
- 1.3. ***Minimum of the identified disturbances of natural communities and territories;***
- 1.4. Presence of human-attractable and vulnerable species and communities;
- 1.5. The “sufficient” area (for a biota estimated component) of topographically (or at least ecologically) integral territory for which the total ensemble of disturbances is recognized as inessential;
- 1.6. ***Abandonment of lands, if this causes no damage to habitats of particular vulnerable species;***
- 1.7. Weak accessibility of territory for population.

2. Features of landscape value:

- 2.1. Relief heterogeneity;
- 2.2. Geological genesis peculiarities;
- 2.3. Existence of specific geological cuts and outcrops;
- 2.4. Representativeness of the landscape and its compounding biotopes if this is possible for estimation;
- 2.5. (Semi-)natural hydrological regime of the territory (minimal or natural fluctuations of underground waters), the presence of slightly disturbed raised bogs, reservoirs and water streams;
- 2.6. Priority of the conservation of a HNMF type, concerned with the bad-conserved ecosystems in a region (country) or because of the main paths of animals migration.

3. Features of social attractiveness:

- 3.1. ***Uniqueness of a HNMF subtype:***
- 3.2. Attractiveness from the viewpoint of awareness raising on the idea of biological and landscape diversity conservation;
- 3.3. Attractiveness from the viewpoint of the ecologically-friendly tourism development;
- 3.4. Attractiveness from the viewpoint of forming the social environment favorable for conservation of biological and landscape diversity (legal provision, economic stimulation, etc).

4. Existence of favorable perspectives of territory development:

- 4.1. From the viewpoint of the conditions of bio- and landscape diversity;

- 4.2. From the viewpoint of the sustainable use of natural resources (including the possibilities to influence a land-use regime, especially when lands are transferred for other needs);
- 4.3. From the viewpoint of social development.

5. Features for economic HNVR classes:

- 5.1. Patchiness of agricultural territories and their subdivision into small contours;
- 5.2. Diversity of land-use types and, correspondingly, the multiplicity of ecotones (places of contact of different biotopes);
- 5.3. Farmlands, surrounded by natural ecosystems;
- 5.4. Extensive land-use with minimal agrochemistry application;**
- 5.5. The sustainable crop rotation that prevents soil degradation (usually, with the high proportion of perennial legumes);
- 5.6. The corresponding level of ecological and agrarian culture, determined through the ecological certification of production;
- 5.7. Land-users relative stability;
- 5.8. Maintenance of sustainable traditional agriculture.

It is necessary to note the complete assemble of these features was used in no countries during this assessment. Features 1.1, 1.3, 1.6, 3.1 and 5.4 were used most regularly.

The different systems of criteria (systematized and ranged estimations of richness, diversity, rarity and so on) are, in many cases, applicable for the identification of HNV farmlands, especially those conserving the important value for biodiversity, in spite of human excessive impacts. Among such HNMF there are:

- Important Plant Areas (possibly, all mid- and high mountains as well as the particular countries as Armenia, Azerbaijan, Belarus on the whole);
- Important Bird Areas (Belarus, Russian Federation and, likely, many wetland HNMF in the boreal zone and Armenia);
- The criteria of identification of core areas of national and local ecological networks if they have a system character (Armenia, Moldova).

2.2. Capacities and limitations of criteria systems regarding HNMF

General power and, simultaneously, weakness of criteria systems are in the necessity to use concrete materials about concrete territories while regional informational provision is:

- much backward from the needs of nature-conservation planning; and
- depending more than some time and some place on the socio-political environment, which is unfavorable for any actions without direct proofs for large businesses.

Criteria of the Important Plant Areas (IPA):

- use arbitrary determination of the portion of the areas richest by species (in a country or biogeographical region; with downscaling – in the lesser zones);
- are extremely hard (without extrapolation) regarding the HNV farmlands but are easier for fulfillment in the regions with higher endemism (mountain regions);
- use absolute estimations, the significance of which is contradictorily;
- do not provide a clear procedure for determination of IPA borders.

Criteria of the Important Birds Areas (IBA):

- are, in a great degree, faced to non-agrarian zones;
- allow recognizing as important the areas easily leaving by birds;
- allow recognizing as important the rather poor areas, basing on data on foraging congregations and on data about migrants, especially if the recognition is referred to rare species only;
- use the absolute estimations with very low accuracy as a rule;
- do not provide a clear procedure for determination of IBA borders.

During preparation of the given work such criteria the following were used (Belarus):

- Rare species of plants and animals of the National Red Book in recent edition exist in the area – not less than 10% of representatives from any class of organisms;
- The area maintains not less than 1 of % national populations of globally endangered plants and animals (by the last version of IUCN Red List or an equivalent list).
- There are rare plant populations (for example, Orchids *Orchidaceae*), which age composition provides with sustainable reproduction.
- Not less that one phase of the living cycle of the critically endangered in Europe plants and animals uses the biotope (not less than 5% of the national population).

It is possible to note that analogous criteria can be used in other countries as well, but the threshold figures must be greater if to speak about big animals or small countries.

Criteria for the selection of core areas of a national ecological network (for example, of Moldova) are based on the reference points received for a certain region. That means their values can be applicable for comparable regions, but are inapplicable for the regions with other basic characteristics (level of human-made transformation, geographical zone, dominant climate, natural richness of relief).

However, criteria for core areas of local ecological networks (LEN) from different regions must converge because of the mathematical causes (taking the logarithm of values serving as reference points), although the criteria conserve probably the influence of unequal reference points if the base characteristic are very distant. Unluckily, that is not proved in practice due to lack of information.

Examples of the criteria for the LEN core areas. In Moldova, the most practicable and ready to use measurable criteria of the National Ecological Network were selected (Andreev *et al.*, 2001) to identify LEN core areas Based on data ranking, the following values of LES criteria are defined:

- 1) territory that maintains reproduction of two bird species or one-two mammals species, or one amphibian/reptile species of the Red Data Book of Moldova (RDBM), or two-three birds species, two – mammals or more than one – amphibians/reptiles from the Operational list (OL is the modern version of Red Data Book* in the vision of national experts).
- 2) territory with ecosystems creating favorable conditions for 3-6% bird species or mammals, or vascular plants met for the country;
- 3) localities providing habitation of not less than two-four insect species of the RDBM;
- 4) localities that maintain 1-2% plant species of the RDBM;
- 5) territories that maintain plant-endemics not included into RDBM or OL;

* There are known examples when the composition of a national Red Data Book has been shortened artificially, proceeding from administrative considerations and even from economy aims.

- 6) territories that do not meet completely the above listed criteria but are the habitats of three-four OL species of all above-mentioned classes of vertebrates.
- 7) steppe ecosystems with plants species density not less than 39-40 per 100 sq. m. that conserves domination of one primary edifier.

Criteria 1, 3, 6, 7 were checked successfully in practice; the character of areas where the examination took place gave no opportunity to check criteria 4 and 5 but the detail of research – to check criterion 2.

Basing on expert judgment and observations, the criteria for sub-natural ecosystems were proposed:

- 8) enclave of a natural forest, capable to natural reproduction and, as a rule, simultaneously possessing a developed forest edge and four-stratum structure with a dominant stand elder than a productive ripeness age for 20 and more years;
- 9) area of pond systems amounts not less than 100 ha, where the significant part (40-70%) is represented by the curtains of reed and other highest wetland vegetation.

According to the conclusion of the Armenian expert of this project the likely criteria are applicable for his country as well, but threshold values must be some higher.

So, the following wording is proposed (Vintchevsky, Sozinov) in Belarus: area of pond systems is not less than 250 ha while cover of riverside water vegetation in spring-summer period takes not less than 50%.

All criteria, both international and developed in individual countries, are insufficient for determination of some HNMF subtypes in the proposed classification because they do not concern the unique or especially landscape values. It is special item that was solved in the project framework basing on personal experience and experts knowledge only.

Taking into account sometimes the huge dimensions of the subregion countries as well as the limited means and sharp deficit of available data, a sample method is applicable to the HNMF estimation task. This is possible when data and expert estimations concerning a part of country or a certain ecosystem type are available. In that case, a possibility appears to extrapolate conclusions upon other parts with the same or likely basic characteristics.

Nevertheless, because of initial data deficit and fragmentation of ecosystems (especially in maintain and highly transformed regions), it is necessary to proceed from «precaution principle». In the given context, correspondence of an area to any single criterion (for example, a number of endemics or species of vertebrates and/or invertebrates, and/or the plants from the Red book, Red list or Operative list) or to any single feature (for example, the HNMF type originality or its contribution into landscape diversity) is recognized as the sufficient for recognition of HNMF.

Principles and criteria link methodically and politically (if they have legal consequences) the tasks of HNMF conservation and the ecological network forming.

With respect to ecological network, HNMF can play the role not only the core but also buffer areas and ecological corridors from local to international levels.

Universality of the HNMF identification principles themselves ties together the EECCA region and pan-Europe on the whole as much as the Governments and policy-makers are ready to conserve national and all-European natural heritage.

Closeness of HNMF criteria within the individual zones of subregion depends on the closeness of their basic characteristics and a degree of willingness of the representatives of individual countries to develop the common methods and approaches, including those to the social and economic sides of rural life.

2.3. IRENA system and possibility to use it for EECCA sub-region

EU shows permanently the serious concerns about the environment conditions within its borders and on bordering territories that is clearly nominated, in particular, in one of the basic documents on agriculture policy. This is so called the **Common Agricultural Policy (CAP)** (http://europa.eu.int/comm/fgriculture/capreform/index_en.htm). In January 2000, EU Commission on agriculture adopted the resolution "Indicators for the Integration of Environmental Concerns into the Common Agricultural Policy", which determines the pack of agro-ecological indicators (AEI). In 2002, to improve, develop and formulate AEI at a proper geographical level, the system **IRENA (Indicator Reporting on the integration of Environmental concerns into Agricultural policy)**⁷ was proposed as the joint project of following organizations: the Directorates General for Agriculture and Environment, Eurostat, Joint Research Centre, and EEA that is responsible for co-ordination.

To date the result of IRENA's activity is development of 40 indicators, the guides to their use and the corresponding sets of information. One from the indicators «26 – High nature value farmland areas» – was prepared in 2004 (IRENA IFS 26 - High nature value (farmland) areas_FINAL.doc).

The descriptive part of the indicator structure includes sections: definition of the indicator; key results; necessary maps and graphics; results and estimation; text introduction, political significance, agroecological context; assessment: interpretation of indicators' results, gaps in data, needs in improvement; sub-indicators; references; data (tables); metadata. The priority of revision is defined as short-term. Organization giving information are: DG AGRI, EEA/IRENA (ETC/NPB). Sources of information: FADN, CORINE Land Cover, European Bird Database, European Butterfly Distribution Database (Vlinderstichting), and World Map Project of Species Distribution (Museum of Natural History London).

It is necessary to note that 33 from 198 types of habitats, listed in Annex 1 to the EU Directive on Habitats, need with extensive agricultural management and can be considered as HNMF. However, in EEA terminology the term HNMF relates mainly to the fields under extensive agricultural management. There is no necessity for them to maintain high biodiversity. Being often the pastures by nature, they also do not necessary include the high part of grassland ecosystems. The idle elements are included in the concept only if they can be considered as the integral part of an agricultural landscape. Thus, small elements such as fences, reservoirs and undergrowth are included, while the large not-arable habitats – no. Large-scale semi-natural systems, e.g. pastures of heather wastelands and plateaus are included in the concept until they are used in agriculture and are necessary to support certain natural values. On the whole, the methodological perfection and further data accumulation are necessary to understand in more detail the distribution of HNMF farmlands in EU-15. For example, no individual maps for different types of HNV farmlands can be developed because of problems with data organization.

⁷ There are some more abbreviations of IRENA .

The system distinguishes the following types of high nature value farmlands:

- **Type 1:** Farmlands with the high proportion of semi-natural vegetation.
- **Type 2:** Farmlands with the domination of low intensive agriculture or the mosaic of semi-natural and cultivated land or small-scale features.
- **Тип 3:** Farmlands supporting the rare species or the high proportion of European or world populations.

Areas of Types 1 and 2 are identified on the basis on landscape structure (CORINE database) and FADN agronomic data. Being combined, these two provide with sufficient information on the distribution and characteristics of farms. However, due to CORINE data limitations on landscape structure, Type 2 is presented insufficiently because of minimal areas for estimation (25 ha), for example, shrub landscapes in France. An additional difficulty is because these structures do not show local impacts such as an overgrazing on some plots.

Areas of Type 3 can be identified on the basis of data on species distribution only. Due to data limitations this was possible for breeding birds only. That is why the species approach, because of data limitations, is not included in this analysis. The highest level of biodiversity coincides with low agriculture loading, and the most valuable HNL farmlands coincide with semiarid grass ecosystems. At present no reliable pan-European data are accessible for plant communities and habitats. The best accessible data are for birds.

It is accepted that farmland birds are most indicative because they depend on the diversity of plant and animal food and the structure of plants for nutrition, nesting and refuges from predators (e.g. Potts, 1986). Tucker и Heath (1994) believe that in Europe more than 40% of all decreasing in number bird species are influenced by agricultural intensification, while the abandonment concerns more than 20%.

However, both these statements need comments. First, the birds as a whole are distinguished among vertebrates only, depending on food diversity and vegetation structure. Second, this dependence is manifested, first of all, at the level of a landscape as the totality of geographical units of lower levels. However, namely at this level the birds are less vulnerable because of maximal mobility of this animal group. At the level of a certain type of individual biotope the HNMF identification resolution is low for birds: a) resolution is connected with the narrow group of the most sensitive species that are almost endangered in strongly transformed regions; b) the possibilities for identification using species richness and diversity in biotopes of open type are restricted and, at least, require evidences.

From the viewpoint of community ecology, the absence of evidences of an area value using any large group of organisms is very far from the proof of its little nature value (Andreev, 2002). So, on the background of the rather dismal picture of vegetation, an area can be estimated as the habitat of especially rare insects. Example done by O. Tsaruk on especially valuable site of the type 4.3 HNV farmlands (the next chapter) shows the same on a rare birds example.

The assessment of intensification and abandonment influence on a birds population decrease shows, first of all, the better provision of this group with data, but this influence can become still more significant for other groups.

The approach itself implemented in IRENA system speaks about a fact that the biodiversity monitoring is far from a desirable level even within EU-15.

IRENA system makes an attempt to attribute the grass ecosystems to HNV farmlands independently on their origin (ravine, mountain and alpine meadows, heather and xerophytes waste lands, rocky and other steppes), through the feature of low pasture load (probably, without a differentiation). This attempt arises some questions due as minimum to five causes:

- 1) Probably, the recovered mountain meadows with a motley grass depleted composition were attributed here (Great Britain);
- 2) Distribution of these lands in the Western Europe forms big polygons that do not completely coincide with the regions of increased species richness, although this is difficult to assess correctly;
- 3) In some countries of the targeted sub-region such lands are absent probably (Moldova, Armenia and other);
- 4) Assessments of grazing loads made based on official data on pasture areas and number of pasturing animals; these estimations can be strongly distorted in some part of the region since the strongly degraded pastures can occupy a serious area in the first-level territorial-administrative units, and the livestock may be understated to decrease a tax burden;
- 5) Some pastures of CA are losing biodiversity because of degradation of the highest vegetation due to insufficient grazing (when populations of the big wild hoofed are eliminated).

Unfortunately, the sub-region countries are mainly not provided with the primary data collection systems as CORINE, FADN and the other, and likely will be not provided in the foreseeable future. Significant difficulties appear either for assessment in current information conditions or for creation of such information systems. One cause is archaism of the land legislation national systems where the land functions are defined unambiguously. So, a part of agricultural lands (as of the other as well) has also, in reality, a nature conservational destination too. Non-recognition of this situation hampers a complex territorial planning and creates a basis for ignoring by the regimes of conservation areas landowners and a law-enforcement system. At the same time, some variants of «land withdrawal from agricultural destination», in essence, are necessary from the viewpoint of long-term sustainable agriculture management. All this concerns completely HNL farmlands too. Moreover, the legislation is not oriented on the real land parameters but only on the type of a land-use (landownership) sector. So, in the land cadastre the forest fund lands are not divided on forests and non-forest territories (such division is given in the forest organization documents). The presence of lands with a forest cover in agricultural landownership is also shown mainly in the landowners' inner documentation. This all hampers both the assessment of HNVL distribution and the implementation of measures to support these territories and stimulate sustainable land-use.

2.4. Lessons of the first HNVF assessment in EECCA countries

The lands that can be potentially attributed to HNV farmlands are identified, in a significant degree, by the types of primary rural use: pasture, mowing, collecting and individual fuel storing up for domestic needs in the scale significant for a local population life level. Other important features are availability of the directly used wild analogues of agricultural cultures, the manipulation by water resources for the interests of agriculture.

In regions with the large and difficult of access areas, covered by natural and semi-natural vegetations, the simplest and most convenient HNVF indicators are:

- In water deficit and mountain zones – first of all, the existence of wild tubicorn and odd-toed ungulates;

- In zones without water deficit – first of all, the regular existence of the large (a thousand and more specimens) migration and forage crowdings of snipes, geese, cranes, ibises, and storks.
- In the second place – the existence of eagles (genus *Aquila*), individual representatives of other daylight predators (*Falco cherrug*, *F. naumanni*, *F. peregrinus*) and owls (*Bubo bubo*, *Asio flammeus*), geese, cranes (and other species of Gruiformes), little bustards, houbara bustards as well as Caucasian grousees in the nesting period.

The indicators, named here as of top-priority, are manifested rather easy, and their presence is usually known for local population and specialists. It is more difficult to fix the nesting birds that are more complex for identification by non-specialists and those are distributed by couples on a more or less vast territory.

The top-priority indicators are absent usually in the regions with prevailing of anthropogenic landscapes where the secondary indicators are revealed rarely. However, this does not mean the HNV farmland absence.

The lessons of special study allow estimating the possibilities to use quick biodiversity assessment in a country with extreme landscapes transformation. For such quick estimation, the approach is possible when the experts classify attended territories by three categories, two of which do not need with detail survey: the evidently biologically poor and evidently biologically rich areas.

From 36 territories, that are examined by the group of field specialists and recognized as HNV farmlands, 30 were estimated using botanical, 27 – entomological, and 26 – criteria related to vertebrates (LES and LAS of Moldova). Only in tree cases the decision was taken or through botanical, or entomological, or criteria on vertebrates. In 17 cases the decision was taken using three criteria groups at once, in 14 cases – using two groups in three possible combinations. In this case, the combination “plants + insects” prevailed (7), and the combination of criteria estimating the animal presence felt evidently behind (2). From the same four territories, identified by landscape features, confirmation by biological features was received for the three (all minus one). In all, 17 areas can be recognized as HNV farmlands by landscape features (the picturesque outcrops and canyon plots, the well expressive particular relief forms). Such result is determined by the character of Moldova agricultural development where open natural ecosystems were conserved mainly if farming is impossible.

Thus, the separate use of any data group gives no reliable estimation: each group of biological criteria results in 72-83%, and landscape assessment – in 47% positive results. If the recognition of an area as important drives measures on their support, the application of a caution principle demands the complex assessment, provided with the used approach.

Based on this survey’s experience, one can say that the cost of an analogous field survey throughout the country may be estimated approximately in \$ 100,000. Such a survey may be carried out during 1-2 years with the availability of human resources (specialists in corresponding directions) at 20-years remoteness, but at present likely for 4-5 years. Such means are comparable enough with the capacities of the National Ecological Fund subordinated to Moldova’s Ministry of ecology and natural resources. It is worse of notice also that the Ministry has not met its engagements in the frames of the Convention on biodiversity that demand to finance such works.

Moldova has about 7,000 forests and forest belts with the area from one to 20,000 ha each. The forestation of north, central and south parts of the country amounts to 8.1, 14.5 и 7.7%,

correspondingly. One of the above-listed method problems: what can be considered as a forest HNMF-enclave? Such an enclave in the strongly transformed landscape cannot be too small, since in this case it does not create sufficient conditions for the reproduction of relatively big mammals and birds (firstly, some birds of prey) and for conservation in a transformed landscape of the noticeable part of species using agrocoenoses. Moreover, too little forest plot cannot contain more or less developed marginal zone. The latter is a component providing the stability of a forest community and significantly determining its population. The low level is defined as 270 ha. From the analysis the tracts were removed, where the participation of locust (alien species that is rather aggressive in Moldova condition) amounts up to 10%.

Thus, basing on the data of Institute of Forest Research and Management, 87 tracts not exceeding 800 ha were selected. Their ranking has separated the last class (more 700 ha), clearly few, as relatively spacious forestlands. Among 84 residuary forestlands six only include hundred-year plots. Therefore, the criterion feature related to old-growth forests was rejected due to recognition that such HNV farmlands are practically absent in Moldova. In order to identify an ecosystem capacity to maintain significant biodiversity, the following features were introduced additionally to the presence of four layers: the stands of pre- and operational age amount to no less than 60%; the natural forests amount to no less than 85% of the area. These areas, in that or another degree, are subjected to grazing.

During identification of protective forest belts as the HNV farmlands, those were rejected where the reconstruction of highly damaged or destroyed by illegal felling belts is necessary or the main tree species form the poor ecosystems. Forest belts with prevailing oak were planted, as a rule, being accompanied by other indigenous species and a rich set of shrubs; their wide – 15-50 m. Usually, in such belts a grass cover is developed; in more narrow belts it penetrates stronger under a canopy, forming the most deficit habitats in agrolandscape.

All this provides the rich structure and trophic conditions for different invertebrates and vertebrates habitation and migration. In the agrolandscape conditions this gives an opportunity to recognize such forest belts as HNV farmlands.

The cursory assessment of some objects showed that due to intensive grazing and ploughing of relatively flat areas the only big ravines and “hyrtopes” (specific for Moldova natural lands-slides in the form of a high step-sides amphitheatre) can correspond to HNMF criteria. To the class of big HNMFs one can relate the systems with a diameter more than 1 km (up to 5; on average - 2.3 km). Proceeding from the area, 19% studied plots are attributed to HNMF. According to expert judgement, natural vegetation covers 10% of these systems, and few places are used by animals. From four such systems three correspond to HNMF biological criteria and two are recognized as the value examples of landscape.

A question about criteria and applicability of the HNMF concept arises also in relation to especially valuable soil plots. The most evident is a rarity criterion, although the formalization of such criteria has not found an acceptable (or generally accepted) decision in community ecology. In relation to endangered species, the substantiation follows the pass to estimate the probability of sustainable reproduction, i.e. the use of additional features. Soils are one of main components of the natural environment for agriculture that has, on the one hand, a physical and chemical basis, on the other hand – a biological basis. The main chemical criterion is the humus content in a soil upper layer corresponding to the highest level of ranking. The main physical criterion is soil layer thickness corresponding to the ranking highest class; in a certain degree, this criterion reflects soil structure fullness. Direct measuring of a biological component is inapplicable in the framework of this study.

However, an arable use results always in the loss of biodiversity because of the mixing destroying a biota layered structure.

Therefore, an especially valuable soil plot may be recognized as HNPF with the absence of soil physical tillage or with the substitution of tillage by a mold method. Simultaneously, concurrent application of these criteria cuts the main part of lands.

3. SUMMARY OF HNV FARMLAND SURVEY IN THE REGION

3.1. Exceptional value of HNPF in the maintenance of biodiversity

(The targeted species, known tendencies by individual species or non-connected really with HNPF, and prominent examples)

HNV farmlands in the sub-region's countries play sufficiently various, but always significant role. They are wild nature oases among cultivated lands (for example, in Azerbaijan, Armenia, Moldova, Russia and Ukraine). They are the spacious natural areas used for haymaking (Belarus), but more frequently – the agricultural animal pasture on plains and plateaus (as in Kazakhstan and Uzbekistan) or in maintains (Armenia, Georgia, Kyrgyzstan, Tajikistan, in the South of Russia).

Mountain HNV farmlands support mainly the diversity of big hoofed animals attributed to the IUCN most disturbing categories (CR, EN, VU). Among them are: Wild Goat *Capra aegagrus*, East Caucasian Tur *Capra cylindricornis*, West Caucasian Tur *Capra caucasica*, different subspecies of aehars Argali *Ovis ammon*, Caucasian Chamois *Rupicapra rupicapra ssp. caucasica*. Nevertheless, numbers of most mountains hoofed animals are estimated as increasing (Markhor, some subspecies of Argali, West Caucasian Tur, Chamois). This is caused by different factors (for example, poaching), but undoubtedly – with HNPF general conditions and use as well.

Some big predators are conserved only in the mountain HNPFs (Snow Leopard *Uncia uncia* – EN, Asian red wolf Wild Dog *Cuon alpinus* – EN, Turkestan Lynx *Lynx lynx isabellinus*); the other (as brown bear *Ursus arctos*) on plains are mainly attached to little-developed, non-agricultural regions. But in the same time, many small predators from the Bern Convention List (BCL) – European Wildcat *Felis silvestris*, Steppe Polecat *Mustela eversmannii*, or from national Red Data Books (European Polecat *Putorius (Mustela) putorius*, Ermine *Mustela erminea*, European Pine Marten *Martes martes*) are still conserved thanks to the HNV farmlands of rigorously transformed landscapes. However, some species can exist in the sufficiently spacious HNPF zones (Marbled Polecat *Vormela peregusna* in steppes and deserts or European Mink *Mustela lutreola* in wetland ecosystems).

Numbers of huffed animals depend directly on HNPF conditions in steppes and semideserts. So, the situation with Saiga is improving up to some level concurrently with decreasing the domestic animals loads on semidesert pasture or, on the contrary, is worsening with its increase.

A situation with populations of some world-endangered species depends on the conditions, use or abandonment as well as on maintenance of the optimal water regime of HNPF in Belarus and Ukraine lowland bogs. Aquatic warbler *Acrocephalus paludicola* and Greater Spotted Eagle *Aquila clanga* (both are VU) as well as Great Snipe *Gallinago media* (LR) can be named among such species.

Additionally to above mentioned, there are concerned with HNV farmlands the following rare birds from the IUCN Red List (CR, EN, VU): steppe habitants – Lesser Kestrel *Falco naumanni*, Sociable Lapwing *Vanellus gregarious*; wet meadows – Long-billed Curlew *Numenius tenuirostris*, Lesser White-fronted Goose *Anser erythropus*, Marbled Duck *Marmaronetta angustirostris*, Red-breasted Goose *Branta ruficollis* and White-headed Duck *Oxyura leucocephala*. They all use HNMF mainly during migration.

On the contrary, different Ciconiiformes, included in BCL and many national Red Data Books of the East-European countries, are the typical habitants of rigorously transformed landscapes of wetland HNMFs: Purple Heron *Ardea purpurea*, Squacco *Ardeola ralloides*, Common Egret *Casmerodius albus* (*Egretta alba*), Great Bittern *Botaurus stellaris*, Little Egret *Egretta garzetta*, Night-heron *Nycticorax nycticorax*, White and Black Storks *Ciconia ciconia* and *C. nigra*.

Many snakes are habitants of HNV farmlands. Those from the globally especially endangered species are Large-headed Water Snake *Natrix megalcephala*, endemics Caucasian Viper *Vipera kaznakovi* and less vulnerable Armenian Viper (*Vipera raddei*). On hard agricultural background, the HNMF impregnations in south East Europe landscapes are typical habitats of BCL species allowing the survival of Large Whip Snake *Coluber caspius*, Aesculapian Snake *Elaphe longissima* and especially rare European Four-lined Snake *Elaphe quatuorlineata*, as well as of Grass-snake *Coronella austriaca*. The widespread more eastern species have a much more vital space. Among them are multicolored Mountain Racer *Coluber ravergieri* and Pallas' coluber (*Elaphe dione*) snakes, Asian Wolf Snake *Lycodon striatus* and Tartar Sand Boa (*Eryx tataricus*). But they are also included in the Red books of countries where they are met.

HNV farmlands are reliable and often -- only habitats and local migration paths of amphibians included into BCL: Crested Newt *Triturus cristatus*, European Fire-bellied Toad *Bombina bombina* and Yellow-bellied Toad *Bombina variegata*, Common Spadefoot Toad *Pelobates fuscus* and Spring Frog *Rana dalmatina*.

The adornments of natural oasis, which are lightly accessible to any observer, are day-time butterflies. Many their rare species included in BCL, national and European Red books are conserved in agrolandscapes thanks only to HNV farmlands: Apollo Butterfly *Parnassius apollo*, Clouded Apollo *Parnassius mnemosyne*, Swallowtail *Papilio machaon*, Caucasian Festoon *Zerynthia caucasica*, Southern Festoon *Z. polyxena*, Freyer's Purple Emperor *Apatura metis*, Scarce Heath *Coenonympha hero*, Large Blue *Maculinea arion* and Meleager's Blue *Polyommatus daphnis*, Large Copper Butterfly *Lycaena dispar*, Jersey Tiger Moth *Callimorpha quadripunctaria*.

Many other attractive insects are met in HNVS, for example, a huge predatory grasshopper Predatory Bush Cricket *Saga pedo*, Metallic Groun-Beetle *Calosoma sycophanta*, Steppe Fairy Flower Wasp *Scolia stepposa* and the other.

The recourse groups of animals (hunting species, plants pollinator and so on) that use HNV farmlands and inhabit here include Asiatic Ibex *Capra sibirica*, Wild Boer *Sus scrofa*, Red Deer, Siberian Ibex *Capra sibirica*, Chukar *Alectores kakelik*, See-see Partridge *Ammoperdix griseogularis*, Quail *Coturnix coturnix*, Pheasant *Phasianus colchicus*, different ducks. But Levantine Viper *Vipera lebetina* and many other are al well.

It is more difficult to list rare and frequently endemic plant species growing in HNPF. This especially concerns the species linked with steppe (e.g. wilt tulip species as *Tulipa regeli*, *T. gesneriana*) and rocky habitats. There are very much of such plants, but they are mainly known to specialists only.

Some of the striking recourse species of wild plants form their own ecosystems. These are wood formations of: pomegranates *Punica granatum*, Common Jujuba *Ziziphus jujuba*, Apples, Almonds, Cherry-plum, Shadberry, European and Forest Walnuts, Pistachios. These are also herbaceous ecosystems, for example, of Black Cumin *Bunium persicum* (Tajikistan Red book), Origanum *Origanum vulgare*, etc. Very much of the widely known (different Saint-John's-wort *Hypericum*, Liquorice *Glycyrrhiza*, Knotweed *Polygonum*), little known (Giant Fennels *Ferula foetidissima* and *F. kuhistanica*, Green Carpet *Herniaria glabra*) and still unvalued herbs are concerned with HNPF farmlands or conserved only within them, among agrolandscapes.

3.2. Examples of prominent HNPF

1. Enclaves and vast territories of natural and seminatural grass vegetation

1.1 Steps and rocky steps that preserved primary edificatory

Bagerovo steppes in the north part of Kerch peninsula (Crimea, Ukraine). 9,200 ha. Undulating area, mainly covered by steps, with the outcrops of limestone and intermittent streams in the dippest valleys. A former military polygon, which at present is actively used for agricultural needs. The area is important for protection of rare steppe birds - Little Bustard *Tetrax tetrax* (up to seven nested couples and 70 individuals out of a nest period) and Great Bustard *Otis tarda* (up to 20 nested does, out of the nest season – up to 120 does), as well as the plants and insects as Giant Wasp *Scolia maculata*. A part of the territory is protected in Karalarskii reserve. **Factors of threat:** the ploughing is possible in the most part of natural areas. Creating a high-rank protected area (for example, a reserve or regional landscape park) is necessary.

Ulitau dry-steps landscapes in Arganati Mountains and in the north part of Ulitau Mountains (Karaganda oblasti, Kazakhstan. About 20,000 sq. km. Feather grass and Needle grass, wormwood Sagebrush, Wheatgrass ecosystems that are not subjected to a strong anthropogenic transformation due to low human population and moderate grazing (cattle, horses). There are habitats of Steppe Marmot *Marmota bobac* (characteristic species of well preserved steppes), Saiga, Argali *Ovis ammon* (by the middle 1960-s), manul (*Felis manul*), Imperial Eagle *Aquila heliaca*, Steppes Eagle *Aquila rapax*, Golden Eagle, Pale Harrier *Circus macrourus*, Saker Falcon *Falco cherrug*, Peregrin, Lesser Kestrel *Falco naumanni* and other. Moreover, the historical monuments are here: petroglyphs, Djuchikhan grave (Chingiskhan son). **Factors of threat:** poaching and fires.

1.2. Plain meadows with the domination of typical meadow formations plants

The River Soj flood-lands in Gomel oblast (from the River Besiadzi to town Vetca), Belarus. 13,400 ha. The flood-lands wide reaches up to 5-6 km, riverbed is meandering with a width of 50-90 m. Water regime is typical for Polesie plain rivers: high spring flood with mean water rising level up to 4-5 m; summer-autumn low water is interrupted by frequent rain freshets. Steppe and waterlogged meadows prevail. There are also back bogs, not numerous and oxbows strongly overgrown with water vegetations as well as a small oak-wood. Earlier the flood-land was intensively used for hay-making and grazing. Economic activities were stopped on some area after the Chernobyl disaster and

radionuclide pollution. Being the important stopover of geese (more than 20,000 individuals) and sandpipers (about 30,000) during spring migration, the site is nationally significant place for nesting of two globally endangered species Landrail and Great Snipe. Species included in Belarus Red Data Book are registered here: Osprey *Pandion haliaetus*, Terek Sandpiper *Tringa cinereus*, and Little Tern *Sterna albifrons*. IBA from 1998, a national status is absent. (Kazulin et al., 2005). **Factors of threat:** the evident hazards are absent or not estimated; formation of monotonous willow communities and shortening the valuable habitats is possible when absence of hay-making.

1.3. Alpine meadows with natural habit by their vegetation structure

Alpine meadows around Sevlich reserve in the central part of Karabachos plateau in Armenia and at Azerbaijan frontier. About 6,000 ha. This is a depression with Sevlich Lake in the centre (2,685 m above sea level). The reserve (2,400 ha, including the lake about 1,800 ha) is not so significant as surrounding slopes in the ring of mountains up to 3,200-3,500 m. Different types of carpet and meadow communities of alpine vegetation cover slopes together with ecosystems of rocks and slide-rocks. 191 species of vascular plants are present, 5 Armenia endemics and 14 species from the Red Data Book are among them. Fauna of beetles is studied insufficiently, but 40 species among already identified ones are the Armenia endemics, including longicorn beetle *Dorcadion sevlichi* described from the site. **Factors of threat:** a degradation resulting from intensive grazing.

Nakhichevan alpine and subalpine meadows in Azerbaijan. Meadows are used as summer pastures. There are 890 species of higher plants and habitats for main populations of Red Data Book species: Asian Black Grouse *Lyrurus mlokosiewiczzi*, Caucasian Snowcock *Tetraogallus caucasicus* as well as for Dagestan Goat, rare mice, etc. **Factors of threat:** overgrazing and driven problems e.g. community degradation with spreading of inedible and poisonous plants more and more.

1.4. Semideserts and deserts

Ustjurt Plateau (North-West Uzbekistan). Above 6,500,000 ha. This is a plane, elevated over adjusted territories and separated from them by steeps up to 300 m-height. Beyond the Uzbekistan bounds, the plateau stretches into Kazakhstan. Constant watercourses are absent; there are some mainly saltish or bitter-salt springs. Wormwood-halophytic deserts with a sand shrubbery ridge altered by takyrs and basement rock outcrops. There are sluggies with unique but poorly studied flora and entomofauna. Climate is distinctly continental with +35-40°C in rainless summers; winter air temperature is up to -40°C, with strong winds. This zone is transitional from the temperate deserts and semi-deserts to south deserts (Rachkovskaia et al., 2003) and the habitat of one of the most conserved Saiga's (*Saiga tatarica*) populations. Honey Badger *Mellivora capensis indica*, Kyzylkum Sheep *Ovis ammon severtzovi* are here and species of the IUCN Red List nesting: Black Vulture *Aegipus monachus*, Imperial Eagle – *Aquila heliaca*, Saker Falcon *Falco cherrug*, European Four-lined Snake – *Elaphe quatuorlineata*, Central Asian Tortoise – *Agryonemys horsfieldi* and other. Until now the local inhabitants are communicating about meetings with Cheetah *Acinonyx jubatus*. There are notable populations of the relict plant *Malacocarpus crinitifolius* and tulips *Tulipa spp.* **Factors of threat:** poach hunting (according to some data, the territory is used for illicit trade among Kazakhstan, Uzbekistan and Turkmenistan); hardening of Saiga's migration by railway and pipelines; increase of disturbance from exploration works. Construction of frontier obstacles can disrupt Saiga's migration paths, and special efforts are necessary (possibly, the situation can be facilitated by all countries joining to the Memorandum on better understanding in the sphere of Saiga's conservation). The current protection of existent reserves is rather declarative. (Materials of GEF/WWF project

Creation of an ecological network as a base for the long-term conservation of Central Asia biodiversity», 2003-2006).

1.5. Natural bogs conserved due to specific regime of underground waters

Dzikae (Wild) bog in Belarus's Grodno and Brest oblasts at the Baltic and Black Seas watershed. 15,206 ha. The bog forms hydrological regime of "Belavejskaia pucsha" National Park, main Narev and Jaselda Rivers and the entire region. It is one of the biggest European low-lying swamps conserved in native state. Main use is haymaking. Adjacent lands are mainly drained and transformed. Sedge swamps prevail; numerous forest islands are located among them. Vegetation is very various but the associations with sedge domination prevail. Mean deep of a peat deposit – 141 cm; the maximal – 300 cm. Underground water level is practically constant (near soil surface), but in the east part is strongly lowered. There are five drainage channels but main discharge has been blocked since 2005. There are 99 species in avifauna, 14 of which are included in the Belarus Red Data Book (2004). Great Gray Owl *Strix nebulosa* and Eurasian Eagle Owl *Bubo bubo* are among them. Large populations of nesting species of the IUCN Red List have international value: Aquatic Warbler *Acrocephalus paludicola* (1200-1500 males), Greater Spotted Eagle *Aquila clanga* (4-5 couples), Corn Crane, Great Snipe (not less than 75 males). Fauna includes also 28 mammal species (the nationally significant lynx and elk populations), 4 reptile and 5 amphibian species. There are 13 registered insect and 14 plant species from the Belarus Red Data Book. Since 1999, 92% of total area have been attached to "Belavejskaia pucsha". They became the part of the transboundary biosphere preserve, but the land assignation has not finally officially registered. From 1998 it is IBA. **Factors of threat.** To-date bushing is within 5%, but the disturbance of natural hydrological regime fastened successions, that was facilitated by the almost stopped hay-making during last years. 30-40 years ago mow cleaned the swamp practically completely (Kazulin et al., 2005).

Colchis swamps in Georgia. 16, 450 ha. One of them – the unique percolated (leached) peat swamp Ispani II – is fed only by rainwater and is domed at four-five meters above ground surface. Part of swamps is drained for the tea, tung-tree and citrus plants. Since the early Bronze Age the cattle breeding is widespread (cow, pig, sheep, goat, and buffalo). Degraded secondary coenoses represent cattle pastures; meadows are used for hay. Many relict plant species are met at a peat bogs purlieu. Among the Georgia Red Data Book species one can name Roundleaf Sundew *Drosera rotundifolia* and endemic Colchic Water Chestnut *Trapa colchica*. Among mammals from the INCN Red list there are Otter, Mehely's Horseshoe Bat *Rhinolophus mehelyi*, Major's Pine Vole *Microtus majori*; from reptiles – Bigheaded Grass Snake *Natrix megalcephala*. **Factors of threat:** overgrazing.

1.6. Especially valuable and etalon soil plots

Resource preserve of xerophyte chernozem (Kahul region of Moldova). About 10 ha. The subtype of chernozem is formed under savanna type ecosystems with the prevalence of low density pubescent oak stand and developed steppe grass layer including a significant proportion of Mediterranean species. Humus content in the upper horizon is up to 11%; in the preserve, the highest level of humus content amounts 9.4%; the soil thickness is up 150 cm. Soil biota is not studied, and presence of endemic microfauna is likely. **Factors of threat** are absent.

1.7. Deer tundra

Vaigach Island in Russian federation. Area is 340,000 ha. Biological reserve where moderate grazing of Caribou *Rangifer tarandus* supports tundra vegetation. There are habitats of different rare birds as ones under protection of Bern Convention: Peregrine *Falco peregrinus*, White-tailed Eagle *Haliaeetus albicilla*, Bewick's Swan *Cygnus bewickii*, Barnacle Goose *Branta leucopsis*. **Factors of threat:** overgrazing, spring hunting, poaching, factor of disturbance.

1.8. Digressive or specific pioneer ecosystems

Faustovskaia Flood-land of the Moscow River in Moscow oblast (Russia). Area is about 9,000 ha. Because of intensive cattle grazing, vegetation does not represent a higher nature-conservative value. Nevertheless, the nesting sites of many bird species including those under protection of the Bern Convention are conserved. Near 400 pairs of Corncrake *Crex crex*, Great Snipe *Gallinago media*, Black Tern *Chlidonias niger*, White-winged Black Tern *Chlidonias leucopterus*, Little Gull *Larus minutus*, Hen Harrier *Circus cyaneus*, Montagu's Harrier *Circus pygargus*, Yellow-breasted Bunting *Emberiza aureola* are nesting. During seasonal migration Lesser White-fronted Goose *Anser erythropus* visits the site. Reserve of the regional level covers near 2000 ha. **Factors of threat:** draining, agrochemistry, overgrazing, untimely haying, spring hunting and poaching.

1.9. Areas of alkali soils of the natural origin

Preserve of Ararat cochineal in Armavir oblast of Armenia. About 217 ha. One of the last and biggest preserved saline land plot in Ararat plain. Edificators – reed and velvet shore bugs. 105 vascular plant species are recorded. The biggest and likely the last in the world population of Ararat cochineal is conserved. From approximately 100 recorded beetle species 6 are the Armenia or narrow-regional endemic.

Factors of threat: change of hydrological regime at surrounding territories due to the recommencement of intensification and ameliorative activity; overgrazing is possible.

2. Wetlands formed due to land-improvement activities and the natural parameters of territory

2.1. Secondary waterlogged places of the natural character of development

Aivazia tract in the Dniester valley in the Stefan-Voda District. About 60 ha. The lowest place in Moldova (1.75 m below the sea level). A part of the drained valley with the fragment of the arterial channel that was swamped after stopping the forced dewatering. The site is covered by the various vegetation of grassy bogs and waterlogged meadow. Corncrake and Short-eared Owl *Asio flammeus* are among the nesting birds; Yellow *Ardea purpurea*, Purple *Ardeola ralloides*, Great White *Egretta alba* and other herons, black stork *Ciconia nigra* and various sandpipers are foraging here. Many birds of prey use the site during migration. Otter *Lutra lutra*, Ermine *Mustela erminea*, European Fire-bellied Toad *Bombina bombina*, European Tree-frog *Hyla arborea*, European Pond Turtle *Emys orbicularis* live also here. Five species from the RBM insects are recorded as carpenter-bee *Xylocopa valga* and Southern Festoon *Zerynthia polyxena*. **Factors of threat:** attempts of tillage and cattle grazing in the periphery part that result in soil salinization.

2.2. Kiarizes in surroundings of oases

Kiariz near Khodzhavent in Azerbaijan. A system of underground galleries that brings waters into the outer reservoir. Flora and fauna is not studied properly, however the Mediterranean Horseshoe Bat *Rhinolophus euryale* – VU is found.

2.3. Mill-pond systems in sub-natural surroundings

Teriaevskie ponds in Moscow oblast that were dug out in the XV century, approximately simultaneously with construction of the Iosif-Volotskii Monastery. Near 40 ha including adjacent land. At present ponds look as a natural reservoirs in surrounding of meadows with modest grazing. Many bird species of BCL are nesting: Red-necked *Podiceps grisegena* and *P. auritus* Slavonian Grebes, Little Bittern *Ixobrychus minutus*, Corncrake, Great Snipe *Gallinago media* – LR, Great Snipe *Gallinago media Tringa glareola*, White-winged Black Tern *Chlidonias leucopterus*, Little Gull *Larus minutus*, Hen Harrier *Circus cyaneus* and Marsh Harriers *C. aeruginosus*. The regional reserve. **Factors of threat:** factor of disturbance, artificial improvements. (Wetlands ... 1998)

2.4. Sub-natural ecosystems resulted from the creation and functioning of hydro-technical systems

Armashskie Fish-breeding Ponds – the part of Ararat plain ponds system that was created in the 1970-s. There are 29 ponds of the total area 1514 ha; 30-50% from which is rushed. From 180 met bird species, 120 are wetland inhabitants; 3 of them of the IUCN Red List and 24 of the Armenia Red Data Book are nesting here. The area is attributed to IBA. **Factors of threat** are probably absent but changes in local market can provoke ploughing up of the area.

Ikva River Valley in Khmel'nitski oblast, Ukraine. 22,500 ha. This is large pond system where thickets of bog vegetation, remainders of wet meadows and different bogs take significant part. The valley is used in agriculture and fishery. The ponds are important for nesting and migratory wetland birds. Up to 6,000 specimens of the Greylag Goose *Anser anser* and Lesser White-fronted Goose *Anser albifrons* are registered during migrations regularly. There protected plant species. Creation of a national-value reserve is necessary for the whole territory. **Factors of threat:** unregulated agricultural activities and hunting.

3. Enclaves⁸ of natural and sub-natural wood and bush vegetations (including ecosystems likely to savannas) conserved in agro-landscapes

3.1. Plain forests keeping capacities to natural successions

Priirtishie Belt Pineries in Pavlodar and East-Kazakhstan oblasts of Kazakhstan – the unique extensive ecosystems – coniferous intrazonal forests in the steppe zone, and the only analog exists in Canada. That is a vast line along the Irtysh River where narrow sectors and enclaves could be recognized as the HNV farmlands. There are Golden Eagle *Aquila chrysaetus* and Saker Falcon *Falco cherrug*, and some plant species of the Kazakhstan Red Data Book. Pine forests and significant bush area have value both for timber production (and rural development, and for maintenance of climatic parameters and biodiversity along the Irtysh River flood-land. **Factors of threat:** at present felling is forbidden, but the problem of illegal timber-felling exists.

3.2. Mountain forests and bush formations of mainly indigenous composition

Koturbulaksco-Talgarsko-Turgenev Mountain forest massive in Kazakhstan, is the important center of mountain agrobiodiversity concentration. Zailiiski Ala-Tau flora numbers over 1,600 species and within the site (northern microslope in center of the Zailiiski Ala-Tau) about 60-65

⁸ See below Problem 1

% of all-region flora and over 1,000 high plant species are met. Total number of endemic plants is 22-25 species in flora, and 15 of them are met within the site. In Zailiiski Ala-Tau 54 plant species require the urgent protection measures and are included in Kazakhstan Red Data Book of 1981. The site supports 43 such species, including Sieverce' Apple-tree *Malus sieversii*, Janczevski's Currant *Ribes janczevskii*, Kolpakovski's, Ostrovski's and Late Tulips (*Tulipa kolpakovskiana*, *T. ostrovsciana* and *T. tarda*), onion *Allium galanthum*. Many species are relicts and endemics. Populations of wild apple-trees (*Malus sieversii*, *M. Kirghisorum*, *M. niedzwetzkyana*) and Common Apricot (*Armeniaca vulgaris*) have the global value. Other wild analogs of agricultural plants are Currants (6 species), Barberry, Raspberries (3), Hawthorn (3), Sea-buckthorn, Dog-roses (5), Onions(1), Rowan-tree (1) Tulips (3-4), alfalfa (2), Hop (1), Bird cherry (1). **Factors of threat:** The irrational use of mountain-forest ecosystems resources, expansion of economic activities, the genetic erosion of the world-value wild-fruits populations and illegal wild-growth harvest. (Project of Kazakhstan Government / GEF / UNDP "Conservation of mountain agrobiodiversity in Kazakhstan).

3.3. Gully forests concerned with the complex forms of relief

Maxy Gully Complex in Ryazan oblast, Russian Federation. 344 ha. This gully branchy system with general extension of 15 km is in the forest-steppe zone on River Para right bank where a temporal watercourse flows into at the gully bottom. Valuable natural complex of steppe-influenced grassy-legume-forb meadows, steppe bushes and oak forest in area of leached black soils near it northern border. The site supports BCL species *Jurinea cyanoides* and a number of plants species that are included into the Ryazan oblast's Red List (e.g. *Lilium martagon*, *Anemone sylvestris*, *Cerasus fruticosa*, *Xanthoselinum alsaticum*, *Serratula lycopifolia*). The natural memorial of regional value. **Factors of threat:** overgrazing, grass burning. (Kazakova, Sobolev, 2004)

3.4. Flood-lands forest and bushes

Sirdariinskije Riparian Forests (tugais) in South-Kazakhstan oblast, Kazakhstan. About 100,000 ha. Residuals of formerly spacious ecosystems, supporting the region biodiversity. Rural population uses the area for pasturing, hay making, gathering of fuel and materials for hand-made goods. Bactrian Deer *Cervus elaphus bactrianus* is reacclimatized here. There is the rich hunting fauna (pheasants, waterfowl) and rare plant species. **Factors of threat:** unregulated agricultural activities, thicket annihilation for fuel, and poach hunting.

3.5. Wood-bush vegetation created by slash-and-burn use

Augustovskaia Puscha in Grodno oblast, Belarus, at the Poland-Lithuanian frontier. About 12,000 ha. The unique for western Belarus and the Baltic landscape is situated along the Grodno Hills where an undulating alluvial terracing and moraines appeared as the result of secondary water-glacial processes. Aeolian sands are spread in the east part of the territory and create the ridge of dunes and deflation hollows while kame mounds and thermokarst cavities are in the southern part. Canyon-like valleys accompany the river network; there are many closed and not closed lakes, and the up-river and low-lying flood-land bogs. Individual trees age in existed old-age oak, hornbeam, and lime forests exceeds 250-300 years. However, the mossy pineries ("liadi") grown on arable land amount over 95% of the area. Before 1939, grains and cultivated crops were grown during several years after felling and fires, and then lands abandoned for natural forestation. Footprints of such management are well visible on soil cuts as well as in microrelief. Territory is the only in Belarus, where the nesting of Red Kite *Milvus milvus* is proved; in all 11 protected bird species are recorded.. There are no less than

20 vascular plants (including ones of the biggest on Belarus territory populations of *Polipodium vulgare* and *Anemone sylvestris*), two moss species, and 11 insect species from the Red Data Book (Red Data Book ..., 2004; Dubovik, Skuratovich, 2005). IPA is included into «Sopothkinskii» preserve. **Factors of threat:** felling in the valuable forest communities, suburban-building, the ploughing up of important flood-land plant communities and cattle overgrazing, poaching and excessive recreation loads in the most biologically and esthetically significant flood-lands plots of the Shliamitha and Neman Rivers. However, the current preserve's borders and regulations do not correspond to the goals of the "August pusha" region conservation and use. There are no plans of the preserve management and the coordination activities with adjoining Poland and Lithuania.

4. Biotopes, which origin is bound up with sometimes ancient or special rural activities

4.1. Fruit and nut forests irrespective of their origin

Pistachio sparse growth "Karatau" in the central part of the Karatau mountain ridge of southern Tajikistan. The site locates on relatively smoothed watershed. Trunks of individual trees reach up to 5-6 m and height 5-7 m. In spite of 500-600-years age, pistachio-giants bear usually fruits. Round almost spherical crown creates a specific "tower": low branches descend almost to the ground, protecting from direct sunrays. Many inhabitants escape here from hot (Urials, Sand Gazelles), and green vegetation is kept longer. Grassy vegetation is rich and Vavilov's Almond is spread. Western Desert Monitor *Varanus griseus*, Asian Wolf Snake *Lycodon striatus bicolor* and Levantine Viper *Vipera lebetina turanica* inhabit the site as well as Griffon Vulture *Gyps fulvus* and other rare for the subregion birds of prey as Short-toed Snake-eagle *Circaetus ferox hephneri* nesting on pistachio-trees. **Factors of threat:** overgrazing that stops seed regeneration, felling for fuel and sometimes poaching.

4.2. Secular or very old orchards capable to long-term self-keeping

Crimean mountain orchards. These orchards are known as example of medieval horticulture. Apple and pear trees of local kinds reached centenary age and formed special image; branches were supported by poles, especially during fruitage. Lightened community encouraged rich mottle grasses attracting anthophilous insects that include rare species. That was traditional horticulture of ethnic Crimean Tatars. Available nowadays data are absent. **Factors of threat:** abandoning.

4.3. Local systems of forest belts capable to long-term existence

Meliorative Saxaul Plantations in Djizak oblast, Uzbekistan. About 100 ha. Mean heights - 170-250 m below sea level. The area represents a typical piedmont plain with large areas destroyed by overgrazing; level of degradation is high. On this background the saxaul plantations look like as the real oasis: populations of some astragalus species, wormwoods and cereals are kept safe under their crowns. Trees serve as nesting place for a number of birds, even including periodically Steppe (*Aquila nipalensis*) and Imperial (*A. heliaca*) Eagles. Houbara Bustard *Chlamydotis undulate* is quite regularly registered here. There is high density of Central Asian Tortoise (*Testudo horsfieldii*), Western Desert Monitor (*Varanus griseus*), and Bukharian Borer (*Julodis bucharica*) and mantid *Hierodula tenuidentata* are noted. **Factors of threat:** felling, damages from livestock, fires. A real protection is absent. As an experiment, part of the area is leased or local population in the framework of the measures for creation of Nuratau-Kyzylkumskii Biosphere Preserve. (Materials of GEF/UNDP/Uzbekistan Government Project, 2002-2006).

4.4. Ecosystems resulting from the terracing

Terraces of Aspindskii District in South Georgia. The typical for Georgia terraces located on slopes of Djavahketi Plateau were created during many centuries to cultivate vineyards and fruit orchards, but today are practically uncultivated and covered by wild vegetation. Wet moderate microclimate, formed by the Kura River is characteristic for slopes with terraces unlike to other part of the Plateau, where local climate is dry-continental, **Factors of threat:** overgrazing and attempts of intensive agriculture.

4.5. Mighty ravine systems and slope territories

Sengileevskie and Podvalskie ravines (steep banks) of Ulianovsk oblast in Russian Federation. About 5,000 ha. Genetically typical for the region of Privoljskaia Height type of relief with the spacious manifestation of landslide processes is the unique in the country. Vegetation is mainly stony steppes and broadleaf forests with the domination of *Quercus robur*, *Tilia cordata*, *Acer platanoides*, *Ulmus laevis*, *U. glabra* and high concentration of rare, endangered and endemic plant species. Being attributed to the forest fund, woods are used widely for grazing and haying. The area is chosen as the core area of Saratov Oblast Ecological Network and estimated as the IBA of international importance. **Factors of threat:** overgrazing, illegal felling and chalk mining.

Mixed HNMF variant

Rostashinsko-Irgizskii Watershed of the Big Irgiz River and its Rostashi tributary in Samara oblast of Russian Federation. About 7,000 ha. This is a plateau-like watershed dissected by some wide dales (with the landslide relief forms) hollows and several tops with gentle slopes. About half of the site is ploughed up. Variants of dry and true motley-fescue-feather grass steppes, communities of automorphic solonetz and hollow forests, fragments of forest belts form the other part. Fauna includes most part of high level taxa, which are specific for a steppe biome, and almost all functional groups except the nomad ungulates extinct in Europe. That is one of rare places in the European part of Russia. One may trace here the natural communities of the dry-steppe subzone along catenae, from the valley thalweg to watershed and up to the valley thalweg after the opposite slope. Flora and fauna include a great number of species included in the Red Data Book of Russian Federation and IUCN Red List. Steppes Eagle, Demoiselle (*Anthropoides virgo*), Great (*Otis tarda*) and Little (*O. tetrax*) Bustards etc. are among animals and plants include *Fritillaria ruthenica*, *Iris pumila*, *Stipa zalesskii*, *Tulipa gesneriana*, *Eriosinaphe longifolia* etc. This area may be considered as a good example of LFA in Russia conditions. That was a reason to recognize it as the core area of the Ecological Network Of Samara Oblast. Historically, specific land use and landownership just determined conservation of the area mainly. As allotted lands of Bashkirs they avoided of ploughing up and mass settlement during colonization of Zavoljje. At the beginning of the last century population was structured by a net of small settlements and communities. Many of settlementants were left during last decades, a part of farmlands abandoned and steppe communities successfully self-restored. Natural and semi-natural ecosystems are used as outrun pastures in summer period. Livestock decreased two times approximately. **Factors of threat:** the development of oil-extraction and (potentially) slate production. Over decades the area is partly within the reserve with prohibited hunting. Some attempts are undertaken to create a complex landscape preserve since 1993 that was supported by landowners and local administration. However, the oblast authorities are not ready.

Lands where ecological features correspond to HNMF social-ecological classes

Apsarev Track in Taldom district of Moscow oblast. About 4800 ha. Cereal field (barley, oats, wheat) are among natural and semi-natural ecosystems. That is one of the biggest in European Russia sites of pre-migration aggregations of Gray Cranes *Grus grus* and stopover of other birds as Bean Goose *Anser fabialis* (up to 7000 specimens) and Lesser White-fronted Goose *Anser albifrons* during migration. Brown bear *Ursus arctos* uses that place seeking a feed. A part of the track is preserved under regional-level «Crane Homeland Reserve». IBA since 2000. **Factors of threat:** stop of grain sowing, use of agrochemistry, spring hunting and poaching, factor of disturbance. (Sviridova, 2000)

3.3. HNMF diversity and condition in the subregion counties

As known, EECCA countries are significantly different by their sizes and average population density. At the same time proportion of farmlands varies without any visible regularity. Proceeding from this fact, the countries can be subdivided into three categories. Russia (about 23%), Kazakhstan, Georgia and Belarus (43%) are in the category with the least proportion of such lands; Uzbekistan (61%), Ukraine (71%) and Moldova (74,7%) are in the group with the maximal proportion. First of all, it signifies the different content of the 'farmland' notion in different countries. So, in Uzbekistan pastures and hayfields amount 50,5% of the territory. In Moldova those take 12% only and relate to so named 'reserve fund' that is not accounted as farmlands being mainly located at slopes where national rules forbid an arable use. In Ukraine almost 27% of forests are under the agricultural state authorities. Expert estimation of the farmlands/HNMF ratio is shown in Fig.1. However, HNMFs include also lands that are not attributed to the agricultural ones.

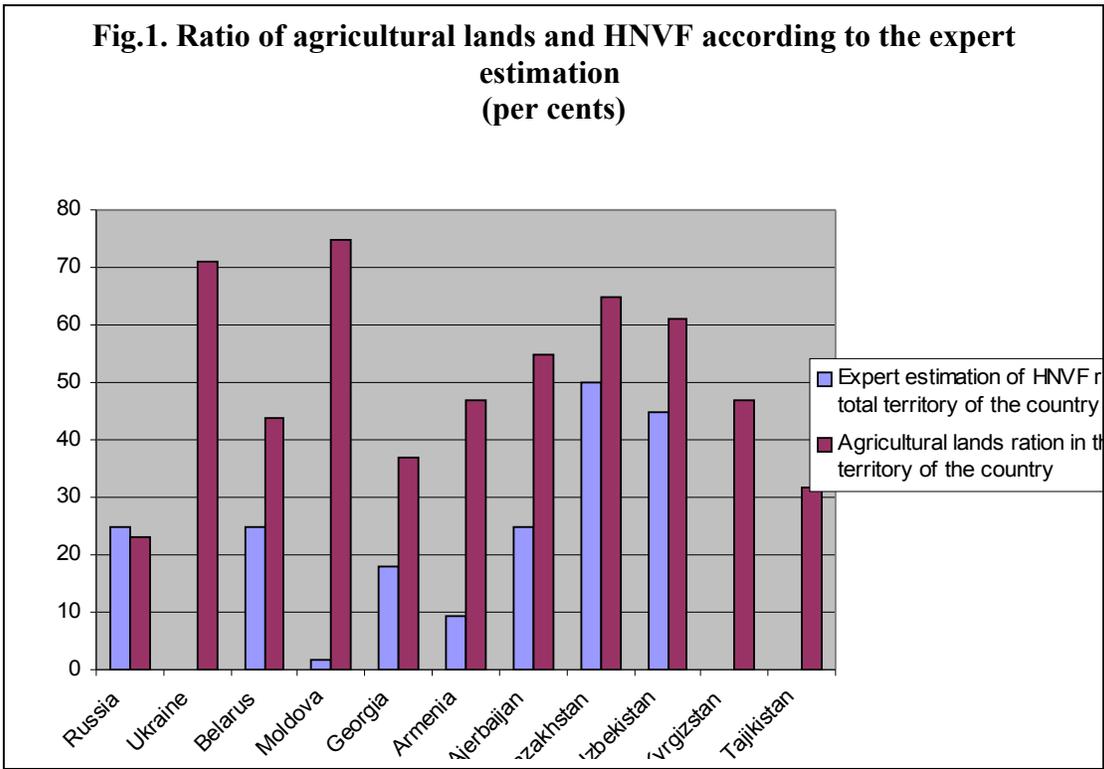
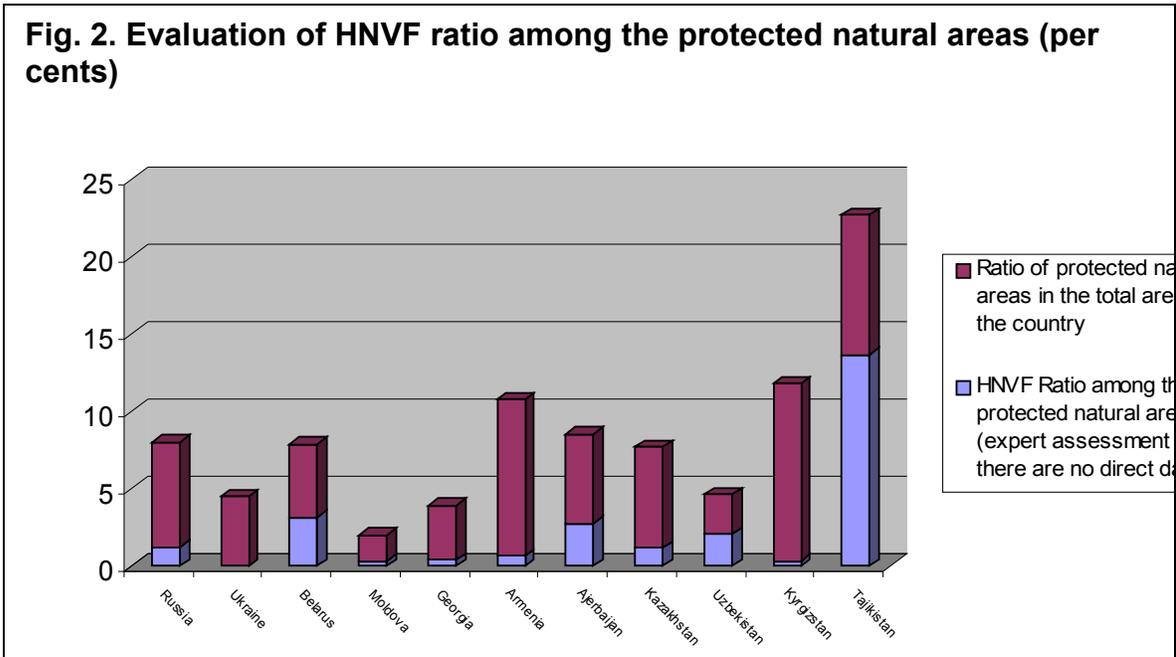


Fig. 2 shows HNPF protection estimated via their proportion versus natural areas attributed to PAs. The picture is rather motley: from the negligibly small figures for Moldova to 50-60% in Tajikistan. This maximal value is connected with prevalence of savanna-type lands among natural territories. Their significant part is under the forest department management, but is mainly used for grazing. Besides this country, from a formal viewpoint, HNPFs are the most protected in Azerbaijan, Uzbekistan and Belarus. Another aspect is PA protection quality. Seemingly, the protected areas regime is kept better in Georgia, Kazakhstan, Russian and Uzbekistan. However, absence of management plans as well as of personnel (or its deficit) is typical for most PAs for the entire region almost (except Georgia where national parks are provided with management planning).



Different variants of steppes and flood-land forests are the most spread kinds of supporting HNVF natural biotopes in EECCA. In total, steppes also occupy probably the biggest area (Table 1). The second place belongs to deserts and semi-deserts (Central Asia and Caucasus) *regarding area*, although proceeding from *presence* in the counties – to alpine meadows and mountain forests. True plain meadows are in Belarus, Russia, Ukraine and Moldova only; in Kazakhstan they are destroyed almost completely, and the variants close to communities of saline soils are present mainly. Fruit and nut forests are in the CA and Caucasus countries; the natural bogs are absent in CA. The rarest biotope subtype related to the HNV farmlands are kiarizes – the ancient by their origin hydrological systems for withdrawal of underground waters in piedmonts and irrigation. Such installation are abandoned in Uzbekistan and escaped practically; such HNV farmlands are conserved in Azerbaijan.

Although data for assessment are not available in all positions (Fig. 3), results are quite evident. Situation seems the most dismally considering steppes and semi-deserts – the most spacious HNVF kinds. Overall, state of all subtypes of natural grassland ecosystems is safer in Belarus, Russia and Ukraine. Wetland ecosystems, which had been formed due to land-improvement activities, are the safest HNVF type. This is especially relates to the secondary bogged sites that are formed because of lands abandonment in a certain degree. Subnatural ecosystems appeared due to constructing and functioning of hydrotechnical systems are safe mainly. On the whole, state of natural wood-bush vegetation enclaves is mediocre excluding the arid countries (CA and partly Caucasus) or poor (Moldova) with such HNVFs, where their state is not well due to different causes. In the fourth type of biotopes originated in the connection with human rural activities, conditions of fruit and nut forests in Central Asia Mountains that give additional recourses for local population and are the depository of valuable gene fund for agriculture causes anxiety.

Table 3. HNMF state assessment in EECCA region

1. Enclaves, spacious areas, or their parts, of the ecosystems of natural and semi-natural herbaceous vegetation:

Country	Steps and stony steps	Plain meadows	Alpine meadows	Deserts and semi-deserts	Native bogs	Particularly valuable and reference soil plots	Digressive, or specific pioneer ecosystems
Russia						?	?
Ukraine						?	?
Belarus							
Moldova							
Georgia							
Armenia							
Azerbaijan							
Kazakhstan							
Uzbekistan							
Kyrgyzstan							
Tajikistan							

-very bad ; - bad; - satisfactory; - good; - very good; ? – no data

2. Wetland ecosystems formed by land-improvement activities due to natural parameters of the territory:

Country	waterlogged places	kiarizes	mill-ponds	sub-natural ecosystems that are formed as result of creating and functioning the hydro-technical systems
Russia	?		?	
Ukraine	?			?
Belarus				
Moldova				
Georgia				?
Armenia				
Azerbaijan				
Kazakhstan				
Uzbekistan				
Kyrgyzstan				
Tajikistan				?

-very bad ; - bad; - satisfactory; - good; - very good; ? – no data

3. Enclaves of natural and semi-natural tree and shrubby vegetation

Country	Plain forests	Mountain forest	Hollow forests	Flood-land forests	Particular forms of tree-shrubby vegetation
Russia					
Ukraine					
Belarus			?		
Moldova					
Georgia					
Armenia					
Azerbaijan					
Kazakhstan					
Uzbekistan					
Kyrgyzstan					
Tajikistan					

-very bad ; - bad; - satisfactory; - good; - very good; ? – no data

4. Biotopes, which origin is bound up with rural activities (sometimes ancient or special)

Country	Fruit and nut forests	Ancient and very old orchards	Local systems of forest belts	Ecosystems formed as a result of terracing	Vigorous ravines systems
Russia		?			
Ukraine		?			
Belarus					
Moldova		?			
Georgia					
Armenia					
Azerbaijan					
Kazakhstan					
Uzbekistan	?				?
Kyrgyzstan					
Tajikistan		?	?		?

-very bad ; - bad; - satisfactory; - good; - very good; ? – no data

Table 4. HNMF state trends assessment in EECCA region

1. Enclaves, spacious areas, or their parts, of the ecosystems of natural and semi-natural herbaceous vegetation:

Country	Steps and stony steps	Plain meadows	Alpine meadows	Deserts and semi-deserts	Native bogs	Particularly valuable and reference soil plots	Digressive, or specific pioneer ecosystems
Russia							
Ukraine						?	?
Belarus							
Moldova							
Georgia							
Armenia							
Azerbaijan					?	?	
Kazakhstan		?					
Uzbekistan							
Kyrgyzstan							
Tajikistan							

-very bad ; - bad; - satisfactory; - good; - very good; ? – no data

2. Wetland ecosystems formed by land-improvement activities due to natural parameters of the territory:

Country	waterlogged places	kiarizes	mill-ponds	sub-natural ecosystems that are formed as result of creating and functioning the hydro-technical systems
Russia	?		?	
Ukraine	?			
Belarus				?
Moldova				
Georgia				
Armenia				
Azerbaijan				
Kazakhstan				
Uzbekistan				
Kyrgyzstan				
Tajikistan				

-very bad ; - bad; - satisfactory; - good; - very good; ? – no data

3. Enclaves of natural and semi-natural tree and shrubby vegetation

Country	Plain forests	Mountain forest	Hollow forests	Flood-land forests	Particular forms of tree-shrubby vegetation
Russia	😞	😄	😞	😞	
Ukraine	😞	?	😞	😞	
Belarus	😄		?	😄	😊
Moldova	😞			🔥	
Georgia	😞	😞		😞	
Armenia		😄			😊
Azerbaijan		🔥	🔥	🔥	?
Kazakhstan	😞	😄		🔥	
Uzbekistan	😞	😞	😞	😞	
Kyrgyzstan		😞	😞	😞	
Tajikistan		🔥		🔥	

🔥 - very bad ; 😞 - bad ; 😄 - satisfactory ; 😊 - good ; 🌱 - very good ; ? – no data

4. Biotopes, which origin is bound up with rural activities (sometimes ancient or special)

Country	Fruit and nut forests	Ancient and very old orchards	Local systems of forest belts	Ecosystems formed as a result of terracing	Vigorous ravines systems
Russia		?	😞		😄
Ukraine		?	😞		😄
Belarus					
Moldova		?	😞		🔥
Georgia	😞	😞		😄	
Armenia				😊	
Azerbaijan	😄	?	?	😄	🌱
Kazakhstan	😞	😞			
Uzbekistan	?		😞	😞	?
Kyrgyzstan	😞	😞			
Tajikistan	🔥	🔥	😞		?

🔥 - very bad ; 😞 - bad ; 😄 - satisfactory ; 😊 - good ; 🌱 - very good ; ? – no data

Table 5. Assessment of HNMF area modification trends in EECCA region

1. Enclaves, spacious areas, or their parts, of the ecosystems of natural and semi-natural herbaceous vegetation:

Country	Steps and stony steps	Plain meadows	Alpine meadows	Deserts and semi-deserts	Native bogs	Particularly valuable and reference soil plots	Digressive, or specific pioneer ecosystems
Russia	😊	😊	😊	😊	😊	😞	😞
Ukraine	😞	😊	😊		😊	?	?
Belarus	😊	😊			😊	😊	
Moldova	😞	😊			😊	😞	
Georgia	😊		😊	😊	😊		
Armenia	😡		😡	😞	😊		
Azerbaijan			😞	😡	?	?	
Kazakhstan	😡	?	😞	😞			
Uzbekistan	😞		😞	😊			😞
Kyrgyzstan	😡		😞	😊			
Tajikistan	😊		😡	😡			

😡 - very bad ; 😞 - bad; 😊 - satisfactory; 😞 - good; 🍏 - very good; ? – no data

2. Wetland ecosystems formed by land-improvement activities due to natural parameters of the territory:

Country	waterlogged places	kjarizes	mill-ponds	sub-natural ecosystems that are formed as result of creating and functioning the hydro-technical systems
Russia	?		?	😞
Ukraine	?			😊
Belarus	😊		😊	😊
Moldova	😞			😡
Georgia	😊			😊
Armenia				😊
Azerbaijan	🍏	😞		😞
Kazakhstan				
Uzbekistan		😞		😊
Kyrgyzstan				😞
Tajikistan				😞

😡 - very bad ; 😞 - bad; 😊 - satisfactory; 😞 - good; 🍏 - very good; ? – no data

3. Enclaves of natural and semi-natural tree and shrubby vegetation

Country	Plain forests	Mountain forest	Hollow forests	Flood-land forests	Particular forms of tree-shrubby vegetation
Russia	☹️	☹️	😞	😞	
Ukraine	😞	?	😞	😞	
Belarus	😊		?	😊	?
Moldova	🤬			🤬	
Georgia	☹️	☹️		☹️	
Armenia		☹️			☹️
Azerbaijan		🤬	🤬	🤬	?
Kazakhstan	🤬	😞		🤬	
Uzbekistan	😞	😞	😞	😞	
Kyrgyzstan		😞	😞	😞	
Tajikistan		🤬		🤬	

🤬 - very bad ; 😞 - bad; ☹️ - satisfactory; 😊 - good; 🍏 - very good; ? – no data

4. Biotopes, which origin is bound up with rural activities (sometimes ancient or special)

Country	Fruit and nut forests	Ancient and very old orchards	Local systems of forest belts	Ecosystems formed as a result of terracing	Vigorous ravines systems
Russia		?	😞		☹️
Ukraine		?	😞		☹️
Belarus					
Moldova		?	?		?
Georgia	☹️	☹️		☹️	
Armenia				😊	
Azerbaijan	☹️	?	?	☹️	😊
Kazakhstan	☹️	😞			
Uzbekistan	?		😞	😞	?
Kyrgyzstan	😞	😞			
Tajikistan	🤬	🤬	😞		?

🤬 - very bad ; 😞 - bad; ☹️ - satisfactory; 😊 - good; 🍏 - very good; ? – no data

In total, the situation is more favorable in the countries with higher economic potential: Belarus, Kazakhstan, Russia and Ukraine).

Results of case study in Moldova.

Main goals of the study included:

- testing of available assessment methods (Chapter 2.4);
- receiving the accurate as possible materials about existence and state of HNV farmlands in the country with especially changed nature;
- identifying of concrete areas, those are in need of protection.

As a main object, the open grassland biotopes corresponding to classification subtypes 1.1 and 1.2 were selected. Since the land-use documents do not allow separating of meadow and steppe lands, they are not divided in the assessment. One can only note the steppe ecosystems prevail strongly, being substituted by meadows along hollow bottoms and in small flood-lands. Meadows of the large lowlands are conserved poorly, mainly along anti-flood embankments. A sample, composed from data of experts of the BIOTICA Ecological Society, includes 184 places. Area of those assessed as the HNVFs applying the LEN criteria amounts 5.5%. They all, as the integral land-use category, are pastures and hay lands (a very negligible part) covering about 11.4% of Moldova territory. Thus, only 20,729 ha or 0.61% of the country area could be considered as the HNVF of steppe and meadow subtypes. PA fund numbers 1,220 ha of reserves that correspond to the criteria. Thus, it is admissible to conclude that 5.56% of HNV farmlands as legislatively protected. Among 17 PAs assessed, the state is recognized as very good in the single site only, as good – in 5 areas, satisfactory – in 6, bad – in 1 place, the critical one – in 4 reserves. The average rating in a five-ball gradation is 2.9 only.

Forest enclaves corresponding to criteria are the next important category. Total area is estimated as 36,549 ha. Earlier some such enclaves had been estimated as the core areas conform to criteria proposed for the NEN of Moldova. Besides, approximately 500 ha of some parcels of hynets – a specific ecosystems from oak curtains and steppe vegetation – correspond also to NEN criteria. Thus, forest NHVFs take 1,09% of the country territory. Following to law, 26.6% (9,717 ha) of these areas are in the PAs Fund, but figure in forest organization documents is lesser – 25.2%. Nevertheless, the regime of protected area is little kept here.

Area of 2095.5 ha are attributed to the biologically valuable forest belts, including 207.7 ha (9.91%) of two systems included into the PAs fund as prominent examples of a protective afforestation in steppe conditions.

The area of large ravine systems and slope territories that can be attributed to HNV farmlands, is estimated as 2,622 ha; 218 ha (8.3%) are registered in the PAs Fund.

Moldova is a country where true bogs are almost absent. Natural ecosystems with flora and fauna of bogs were spread mainly in flood-lands of main rivers that are practically completely transformed for arable farming. In all, the experts know on four natural bogs with not less than 20 ha (130 ha in total). Two of them are estimated as the NEN core areas and HNVFs (80 ha, or 61.54%); both are in the PAs fund. There are many small secondary water-logged places plots in the country, but the only noteworthy area can be reliably attributed to HNV farmlands. It was described in chapter 3.2 and has been formed (63 ha) due impossibility to support drainage system in a flood-land.

Ecosystems, connected with hydrotechnical structures, are widespread in the country; many of them are the pond ones. Unfortunately geographical data necessary for criterial estimation and cosmic images are not available. Total area of such HNMFs known for experts numbers 990 ha; about half of one territory (130 ra) is included in the Fund of PAs.

From 520 ha of 13 recourse preserves of especially value soil plots, included into Moldova's PA fund, only the four (348 ha) can be recognized as HNV farmlands. The lands where tillage took place contrary to law and typical statute were excluded. Mainly, they are privatized plots or those under State forest management. Humus content in some of these plots has decreased by 60%. Thus, the low protection is rather nominal.

Among other HNMF subtypes old gardens that were found mainly before spreading of compacted planting schemes are in the country. They conserved in the most distant from village places being protected from a felling by rural population thanks to neighborhood with forests. Such places are very scanty in Moldova's conditions, small and very difficult for accounting.

Thus, 1.88% of Moldova area can be recognized as HNV farmlands; 17.97% of these lands are in the Fund of PAs. When the total proportions of pasture (11.4%) and forest lands (11.7%) are comparable, namely the grazing lands are found on the second place by area, demonstrating extremely hard degradation of this category. Other HNMF groups carry a much less nominal load in biodiversity support. However, their relative weight increases, either due to especial significance in conserving the rarest and most vulnerable habitat types (e.g. bogs) in the country, or along with decrease of share of natural habitats in landscapes (forest belts).

Absence of special personnel is typical for Moldova's HNMFs within the Fund of PAs, except the plots included into the Codru and Jagorlic Scientific Reserves. Management plans are absent totally. Although Model regulations for other categories of Pas (2001) presuppose development of individual regulations but the latter are absent up to date. There is no supporting management; at best, a protection regime is observed.

Main tendencies in changes. HNMFs are conserved on the background of serious total degradation of farmlands of the analogous ecosystems. Electronic conference "*Pasture and land degradation in the NIS and Mongolia*", which the FAO Russian-language platform of LEAD held in 2005, demonstrated this very evidently. Following to estimations done by participants applying various indicators, moderate degradation embraces 40-70% of pastures, the strong one – 3-15% in countries of subregion. Besides socio-economical causes, deficit of the state legislative and standard regulation is the important factor in all these countries.

Undoubtedly, degradation caused by overgrazing touches upon HNV farmlands also. In experts' opinion, that influences in the most degree upon steppes and stony steppes, semi-deserts and deserts in Azerbaijan, Kazakhstan, Moldova, Tajikistan and Uzbekistan. One may observe stronger degradation in poorer regions within the large countries as Kazakhstan and Uzbekistan. Due to different causes, overgrazing presses lesser upon HNMF in the zone of alpine meadows; in some cases it is explained by intention of agricultural firms to produce ecological items of consumption (Kazakhstan). Relative improvements in socio-economic situation comparably with the 1990-s lead to partial normalization through recovering the livestock outrun and decreasing the grazing around settlements in other countries (Armenia, Kazakhstan, Uzbekistan). Degradation provoked by overgrazing undermines especially vitality of the savanna-type HNV farmlands, including those

formed by fruit and nut tree stands (for example, Kyrgyzstan and Tajikistan). However, it stops absolutely the normal seed reproduction in any enough light forests (for example, in Moldova).

Legal and illegal felling of the most valuable and ripe plots affected all types of natural wood, shrubby and savanna-like ecosystems, even flood-lands forests in water-protective zones (Azerbaijan, Armenia, Belarus, Russia, Kazakhstan, Moldova, Tajikistan, Uzbekistan). Situation became improving in Azerbaijan after 2003. The especially quick destruction of very valuable habitats takes place in Uzbekistan.

On the whole, tendencies in changing state does not evoke an optimism practically everywhere excluding Belarus and Russia, although with some reservations (Fig. 4).

Tendencies in change of HNMF number are not so pronounced, but total drifts in their area change are worse (Fig. 5).

Change of quality in the rural land use. A main aspect regarding the HNV farmlands is possibility to identify lands of social-ecological classes and the economic support. Determination of the category of low-favored lands with traditional management schemes is extremely problematic. Farming quality decreased significantly in most of countries. First of all, that concerns Caucasus and Moldova where privatization had finished to the beginning of millennium and landowners received practically full freedom, and such countries of CA as Tajikistan and Uzbekistan where a transition to individual farming was not accompanied by significant liberalization.

One may make some conclusions based on the whole totality of information and opinions:

- rural population had lost knowledge and skill of traditional farming in all countries during the soviet time;
- appropriate knowledge for modern farm-keeping is deficient in great majority of farmers;
- actors who have such knowledge (individual farmers or more or less large landowners) are inclined either to intensification or to ecological production in case of their individual capability to come to markets of relevant production;
- some exception is so-called ‘dachas’ (summer residencies with a land for very small farming) whose owners have no official status of rural dwellers;
- on the whole, a sphere for identification LFA category is quite narrow since patterns of traditional sustainable little-profit extensive farming are little-spread (Russia) or practically absent (other part of EECCA subregion);
- most powerful farmers and large farms prevail among producers of the ecologically pure production that makes the potential support for lands with LFA as the socially-conflicting in conditions of widespread poverty.

However, these conclusions are preliminary, and the issue deserves special research.

Social-ecological classes of HNV farmlands

It is difficult to estimate the weight of HNV farmlands in the subregion countries without special studies. So, low beneficial lands take important part in Moldova, but this signifies neither they are in traditional farming, supporting a significant biodiversity, nor they are a sphere of especial support on behalf of state. All regions of Russia and Kazakhstan where agriculture felt into decay because of unprofitability could be attributed to LFA. Many settlements are abandoned; huge fallow lands

instead the arable land, and low-used pastures are widespread here (fallow lands are not liable to self-forestation the steppe zone and are used as pastures for domestic cattle, supporting subsistence farming. Many such territories correspond entirely to the HNV farmland concept. However, it is difficult to forecast their fate in case of any support appeared and market development.

Mostly homestead lands and dacha plots can be likely considered as the LAS category in some countries (Belarus, Tajikistan). In Moldova, these are very limited lands where special projects are carried out aiming at the development of ecological agriculture. The newly-developed mountain lands can be probably attributed to the LAES in Kyrgyzstan.

Problems of abandonment and intensification in the sub-regional context

Abandonment of grassland ecosystems that are in relatively good conditions influences negatively always, leading to decrease of floral and faunal diversity and increase of fire dangers (Belarus, Kazakhstan, Uzbekistan, Ukraine, some Russia regions and some reserves in Moldova). This troubles the alpine meadows in less degree. There are another consequences in two diametrically opposite cases. The first one is when wild hoofed animals are – state of their populations is improving and ecosystem ability to natural regulation increasing (for example, semi-desert of Kazakhstan and Uzbekistan, and savanna-like mountain ecosystems of Tajikistan and Kyrgyzstan). The second is the case of the highly degraded ecosystems where an decrease in anthropogenic pressures triggers restoration processes. Therefore, abandonment is not a problem for Moldova and some areas in Caucasus countries, Russia and Ukraine. Overall, abandonment *is limitedly important for the region* excluding Belarus where meadow and bog areas are much spread, and their structural degradation and diminution of relative species diversity take place without haymaking (Kazulin et al., 2005).

At the same time abandonment of farmlands within agrolandscape often does not lead to rehabilitation of value of natural ecosystems (Moldova) or their quick recovering (some regions of Kazakhstan, Russian and Ukraine) as because of difficulties for penetration of rare, recourse and ecosystem-forming species well as because of the habitat's degraded physical and chemical parameters. Nevertheless, an opportunity to carry out ecological reconstruction is created.

Lands privatization and the destruction of collective agriculture had resulted in abandonment of many land-improvement systems during the last 15-years. Their overgrowing provided forming the biotopes of significant biological value, including habitats of rare and endangered species (Azerbaijan, Moldova, and Ukraine). Abandonment of these systems influences negatively HNV farmlands when it leads to additional water discharge for irrigation or to disappearance of reservoirs.

We don not consider relaxation of use of the most forest HNVF subtypes as abandonment, but this favorable probability is low in all countries. On the contrary, full abandonment causes destruction of secular and old fruit orchards, especially in the arid conditions (Kazakhstan, Tajikistan) or the loss of protection for nut and fruits forest from poach felling and overgrazing.

Indirect consequences of land abandonment resulted from military conflicts and radionuclide pollution (Belarus) is another aspect since that increases pressure in the areas where population comes and hazards for HNVF, which are not under effective protection.

Abandonment problem: impacts on key species

Tulip Great (*Tulipa ingens*). A species with low competitive ability that feels itself well in pioneer communities. A pasture decrease reduces its living space.

Regeli's, Shrenk's and other tulips (*Tulipa regeli*, *T. gesneriana*, *Tulipa spp.*). Land abandonment increases potential sites for growth. However the increase of grazing and areas with other disturbed plant cover leads to decreasing aptitude of habitats.

Fig-tree, Pomegranate, Vavilov's Almond, Pistachio, Walnut, Pear-kaion (*Pyrus cajon*), Black Cumin, Sage (*Salvia baldshuanica*), Great Fennel-sumbul (*Ferula sumbul*). These plants form communities in mountain arid habitats where wild ungulates remain. Lands abandonment takes away overgrazing, recovers the normal parameters of soil structure and moisture as well as possibilities for seed reproduction in wood species.

Alpine, Morimus, and Cerambyx Longicorns (beetles) as well as other rare species need with large-sized wood remainders; abandonment and poorly looked forest plots create opportunities for their survival even in small HNVFs.

Predatory Bush Cricket, mantids, ground-beetles and many rare species of butterflies, wasps, bumblebees and other hymenopterans feeding on flowers and depending on motley grass. The main consequence of pasture abandonment is recovering of trophic and structural qualities of a habitat. Plant succession in left arable lands extends space for live. Full stoppage in usage of meadows and steppes worsen habitats for some species (a part of Blue species of butterflies) and groups, sometimes critically (earth-boring dung beetles). However on the whole, such lands are always more favorable than arable or grassy ones on the stages of strong and even moderate digression.

Asian Cobra, Lebetine Vipera, Steppe and Common Adders, different grass-snakes and the Western Desert Monitor. Abandonment lowers different risks in all biotope types besides steppes without wild ungulates where fire dangers increase.

Mountain Goose (*Anser indicus*). Abandonment improves conditions for stealthy nesting and lowers the hazard of egg laying extermination.

Greater Spotted Eagle. In a part of subregion it nests in swamped small-leaved forests of difficult success, in other words in the places with preserved natural regime. In landscapes with deficit of such areas the eagle uses the secondary swamped earlier drained and flood lands. Abandonment is favorable if it does not lead the massive forest advance.

Steppes Eagle. In all the species reacts rather positively on the land use for grazing; if places for nesting are available and use of pesticides moderate it is insensible also to tillage.

Black Grouse. Unlike to Great Britain, abandonment doesn't matter for this species.

Corncrake benefits from abandonment on the whole, although it can lead to reduction of habitats because of meadow overgrowing and disappearance of perennial legume fields.

Aquatic Warbler. On the whole, it rather loses due to abandonment, because it can result in habitats decrease due bushing of meadows and low-laying swamps.

European Roller (*Coracias garrulus*), all bats. They benefit from stoppage of felling that destroys old trees.

Great Bustard profits from removing the overgrazing in the conditions of steppes and mountain savannas, as well as from reducing the risks to be poisoned by pesticides and granulated fertilizers on tillage. However, full abandonment grades benefits because other risks increase and forage resources lowers.

Little bustard. Although the balance of different factors is close to that for the Great Bustard, the species benefits evidently from land abandonment. Current number increase and wider distribution prove that.

Sociable Lapwing. Pasture abandonment has unambiguously negative significance for species due to deficit of sites for nesting. In contrast, arable land abandonment widens nesting possibilities.

Black-winged Pratincole (*Glareola nordmanni*). The full pasture and arable land abandonment is likely negative. Weeds overgrowth shortens suitable places for nesting after one-three years.

Ground Squirrels (*Spermophilus pygmeus*, *S. citellus*, *S. erythrogenys*, *S. suslicus*). Abandonment is unambiguously favourable for survival in landscapes with practical absence of near-natural biotopes. Pasture abandonment is probably harmful in other conditions. Already, it has led to the more dimensioned decrease in number and distribution of these species in comparison with time of special extermination of them as the pests.

Snow Leopard. A balance of factors is rather complex, but human leaving of territories favours widening of their space of live.

Saiga. Tillage abandonment is undoubtedly positive factor. Pasture abandonment has different effects: in semi-deserts of Russia and Kazakhstan it rather lowers suitability and usefulness and availability of habitats and increases indirectly poaching pressure; in dryer landscapes it may effect positively.

Argali, Markhor, Urial, Sand Gazelles and other wild ungulates as well as Menzbier's Marmot are the animals contributing to formation of habitats and benefit unambiguously from abandonment and removal of loading upon pasture.

Brown bear. This species is rare within the south mountain arc of the region's countries, where land abandonment does not diminish high diversity of biotopes, but widen the area for life (Kyrgyzia). On contrary, it is known that rural activity improves landscapes structure and resources for this beast in homogenous forest regions of northern Russia.

Lands abandonment has negative consequences in the following cases:

- a) it leads to concentration of grazing load on other lands;
- b) HNV farmland ecosystems had been disturbed on the whole (meadows and swamps) as the result of former activities, and their replacement by less valuable usual ecosystems (dry shrub and wood formations) takes place;
- c) it decreases diversity and habitats availability for a number specific species;
- d) there is no management of HNV farmlands absolutely, including in PAs.

Abandonment improves state and widens HNVF areas:

- 1) when wild ungulates of open biotopes remain, and elimination of mass or usual poaching will result in natural resources stabilization;
- 2) when space is released for valuable species that form own ecosystems (Pistachio, Pomegranate, Black Cumin);
- 3) almost always for species, rendering a forming influence on an ecosystem (big ungulates and some rodents), although result is ambiguous for some species;
- 4) almost always in the case of forest ecosystems composed by indigenous species.

Thus, though the situation is not certain always, the lands abandonment leads to improving the circumstances for most species and to HNVF widening. On the whole, in experts' vision, abandonment is not a problem of current importance for HNVF of the subregion, except the wet open biotopes in Belarus and partially in Ukraine.

Intensification. There is a reason to separate from the notion "intensification" (i) exhausting use of main natural recourses of agriculture that is typical for all EECCA countries and (ii) removal of HNV farmlands *for or owing to using the geological resources and transport systems* (Moldova, Russia, Ukraine), or for recreation disturbing the ecological rules and, frequently, legislation (Belarus, Russia). These phenomena are destructive for HNV farmlands and sometimes create danger of extinction of a species at national level. So, populations of *Cenolophium denudatum* in Belarus are

concentrated exceptionally in the Neman flood-lands, where building of a hydroelectric power station is planned.

At present, experts consider technological intensification namely from the viewpoint of rather potential hazards for HNV farmlands due to weakness of agricultural economics. For example, danger from pesticides or granulated fertilizers drift on surrounding fields is enough limited now for HNVFs and their inhabitants. Assessment of their influence can be also ambiguous. In particular, study of wild bees and bumble-bees populations in very large orchards of Moldova, which had subjected to a multiple pesticide treatment, showed that these insects are present if their trophic resources – available grass vegetation is kept over entire season. Sometimes, the intensification tools encourage HNVF forming. In dry conditions creating the irrigation systems and ponds is favorable for flora and fauna richness (Kyrgyzstan) if these development does not bring hazards (for example, salinization or destruction of wet biotopes).

Overall, today *intensification as the direction of agricultural development* is not considered as a serious problem for the region.

3.4. Factors and causes of current tendencies

Political factors

Legislative regulation of pasture-use is absent that provokes overgrazing. This problem is typical for Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tadjikistan, Ukraine; sometimes it evinces in Belarus. LEAD electronic conference in 2005 shown the problem is typical for all countries of the subregion, while the necessity of legislative introducing the economical mechanisms providing the conservation of steppe areas is simply unknown. Imperfection and sometimes anti-ecological character of a legislative base influences negatively upon all-type forest HNV farmlands in Moldova, Kyrgyzstan, Russian and Ukraine. Conservational component is weak in policy documents determining the agriculture functioning and therefore little efficient in agrarian and land legislation.

Tajikistan is the only country where high authorities connect possibilities for population life improvement with natural recourses protection and rational use. There is a political will to develop system of PAs in some countries (Armenia, Georgia). Inadequacy of legislative provision for PAs, the low level of existing PA protection and the weakness of the state control influences negatively upon HNV farmlands in Moldova, Tajikistan and Ukraine. Weak development of a PAs network and low steppe representation among them are evident problems for Moldova and Ukraine. In some countries (e.g. Armenia) concept of the ecological network is not recognized even on a documental level. The idea of HNV farmlands is absent absolutely in the sub-region's countries. No country has taken significant or special steps in order to implement anything in this direction of the Kyiv resolution on biodiversity.

Absence of necessary interaction between the environmental and agricultural central bodies is typical for the entire subregion as the insufficient attention of agricultural ministries to nature protection. Correspondingly, national programs on recovering the steppes and grasslands are absent.

Countries of subregion are at different stages of transition to private property in the agricultural sphere. In Belarus the state possesses lands and gives them to the eternal rent of collective farms or the long-term one for not numerous farmers. All lands are in national property in Tajikistan and Uzbekistan. Today's state policy of Uzbekistan is directed for lands transferring to private farmers as

the long-term rent with a right of demise. However, the transferred lands are under state strong control that determines set of crops and even the terms of sowing/planting and harvesting; farmer stock-farms are very small to allow maneuvering with pastures. In Tajikistan lands have transferred mainly to the long-term rent. Privatization is in 'transitional state' in Kyrgyzstan, Russia and Ukraine. Armenia had finished land reform in 1991, Moldova – in 2001, Azerbaijan – in 2003, Georgia – mainly in 2004-2005.

Experts of most countries assess the privatization as unreasoned and anti-ecological by style. As a rule, it has resulted in appearance of very small farms (much less or a little larger than one ha) where correct crop rotations are impossible, and almost natural farming leads to the land worsening and additional load upon HNV farmlands. Even in Russia, where land lots are greater, a small-scale production influences negatively the forming of local markets. The negative impacts of privatization are linked to poor provision with a normative-legislative mechanism of land use. Especially that touches on the public lands while the state ecological control is lost in a significant degree. Prospects of positive influence of local communities either require an examination (Armenia), or had not been proved by the reality (Moldova). Anxiety that privatization and wrong selective work will result in the loss of many sorts is in Kyrgyzstan and Russian Federation.

In general a conclusion may be made: the ecological lessons of privatization in the former socialist space were not used as a rule, and the privatization was not put into practice as a pure political instrument.

Political activity is directly displayed mainly in two variants. All-levels authorities use distribution of rights and facilities for using the natural resources as an instrument of political use; applying of such instrument does not make a sense without presence of «privileged» and «punished» groups that strengthens an unevenness in natural resources use. Due to electoral considerations authorities, first of all at the local level, are not interested to apply restrictive measures and effective punishment of the violators of nature-protective law both in relation to poor population layers and influential persons.

Sometimes, as in Azerbaijan and some remote territories of the Russian Federation, the unregistered economic activity of high-level officials impacts negatively state of HNVPs; such persons receive rights for grazing of many thousands herds on social pastures and state land fund through registering this livestock fictitiously as herds of villagers.

In some cases, e.g. in Kyrgyzstan, policy to develop irrigation systems widens possibility of forming the HNV farmlands; in others, as in Moldova, it may result in retardation of attempts to use irrigation where it has no perspectives.

Connivance, on behalf of politic authorities, of elite hunting and mass poaching, connected with international trade, plays especial role in south-Asian part of subregion; state of populations of Saiga and Saker Falcon (*Falco cherrug*) is a glaring example.

Economic factors

Economic crises and followed privatization of lands and other collective property in rural area had led to situation when new owners were found without productive and operational financial means as well as to deficit of skilled specialists and the inability of many small owners to pay for services.

Financial deficit in all countries (countries, have joining to WTO, are unable to fill the «green basket») and absence of distinct agricultural policies accentuates disparity of prices that is typical for economics and creates an increased pressure upon the rural development. That is disparity between, on the one hand, prices for combustive-lubricating materials and manufactured products, on the other hand – for agricultural products.

Altogether, that has led to sharp decrease in quality and level of production, to maximal relocating the loads on natural ecosystems (Azerbaijan, Georgia, Moldova, some Russia oblasts, Tadjikistan), and to decline of economic activity (a part of Ukraine and Belarus).

Economic weakness prevents states to take sufficient care for fight against erosion, maintenance of large irrigation and land-melioration systems, conservation and development of forest belt systems, as well as to control soil quality and use of agro-chemicals and fertilizers (Moldova, Ukraine, countries of Caucasus and CA). Undertaken attempts to put these expenses on shoulders of the newly appeared farmers, e.g. on associations of water users, have no remarkable success due to weakness of this stakeholder group, imperfection of legislation and failure to observe it.

In conditions when national markets are underdeveloped, local markets and marketing are properly absent, shadow structures substitute suitable place creating a system of intermediaries and keeping the low primary prices. Therefore, despite of high final prices, the stabling is not developing, and a crop rotation including the perennial legumes decreased catastrophically. That intensifies the fall of soil fertility and causes overgrazing of almost toll-free public and state pastures (Kazakhstan, Moldova, Tajikistan and other).

Poverty of population and limited sources of income (Belarus, Kazakhstan, Moldova) force to keep livestock or even to enlarge its number on practically fee-free pastures that also forms over-grazing (Tajikistan).

Strong stratification of population has resulted in distrust to banks on behalf of rural people of the subregion. High interest rates of banks hamper the joining of free and borrowed assets and their investment into developmental directions of activities. That leads to inadequate investments (for example, livestock purchase), and a paradox situation arises when measures undertaken to cope with poverty, result in strengthening the load upon natural ecosystems (Moldova, Uzbekistan), contrary to existing international theories.

On the contrary, some improvement of economic situation in the country promotes expansion of cattle outrun due to production export; this lowered overgrazing in Armenia, Azerbaijan and Kazakhstan. Improvement of economic situation in Tajikistan allowed more attending the government to nature protection.

Concentration of lands in private hands and private investment encourages sometimes the increase in production, land-use improvement and production of elite pure products, but lead sometimes to land degradation and poverty escalation.

Management based on short-term plans prevails because of general instability in agricultural economy, while neglecting of the long-term planning became traditional, and ecologically sensitive agriculture markets are undeveloped.

Noncompetitiveness of traditional cattle-breeding and other agriculture branches in comparison with extractive industry drives neglecting the measures of ecological security, HNV farmlands destruction and decrease of biodiversity.

Shadow forest exploitation linked with corruption affects significantly upon HNV farmlands in Armenia, Kyrgyzstan, Moldova and Russia, destroying remainder of the old-growth forests and large-sized trees, with those many rare species are concerned.

Many rare and other species living in HNV farmlands suffer losses because of poaching (by form or content) and frequently super-profitable elite hunting and fowling (for example, hunting birds). This relates especially to CA countries and is driven often by activities of international agencies such as Association with limited liability "Inter-Ochota" as well as with the state direct support (Kazakhstan, Tajikistan).

Socio-economic causes

Possibly in many countries (for example, in Kazakhstan, Moldova and Tadjikistan) poverty of population provokes authorities to ignore necessity of legislative regulation of pasture-use that connives at overgrazing.

Likely, in many countries of the region the absence of effective demand on many foods (dairy and meat, first of all) in rural areas hampers their offers for sale. Therefore, peoples are forced to grow/receive such products independently on their own farmstead. Being coupled with political and social causes that leads sometimes to overgrazing and pasture degradation, and also to soil exhaustion under the most convenient crops.

There is shortage of ecological education and knowledge of agrarians in all countries. In the same time a part of population possessing «free finances» purchases the land lots becoming farmers without real experience in rural works. That affects adversely grounds in some countries (Uzbekistan).

Social factors, including traditions

After privatization and destroying the old system of commodity circulation, cooperation and sale systems are absent for many products in rural areas. Therefore many families keep cattle at a loss to have dairy products (first of all, milk for children), thus supporting the overgrazing (Kazakhstan, Moldova, Tajikistan).

There is a huge dependence of rural population on the local authorities (most countries) or kolkhoz/sovkhoz leaders (Belarus), which assign or do not assign territories under pasturages for cattle of local population, ignoring necessity to have grazing systems and supporting the overload of certain areas.

The extremely low rural living standards lead to a mass felling of various forests, forest belts and other vegetation suitable for fuel in many countries (Russia, Ukraine, countries of the Caucasus and CA), or to masking the large shadow forest exploitation as poaching of population (Moldova).

The unregulated use of natural resources in HNV farmlands becomes more intense in the countries with historically high birthrates, on the background of rural effused poverty and literacy decrease. Return of population resettled in soviet time on territories with intensive agrarian development to historical residences (Tajikistani) also strengthens press on HNVFs.

In majority of countries of the sub-region (Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan) there is tradition is of cattle domestic milking. Therefore driving of cattle from (to) a village, sometimes distantly, intensifies pressures on pasturages and drove paths, and decrease animals effectiveness increasing the overgrazing.

Although the traditional skills are mainly lost or ignored, relation to different types of natural objects also influences state of HNVF and biodiversity. Thus the relation is rather negative to swamps and steppes (Russia) and evidently negative to snakes (Moldova, Russia, and Ukraine). Other objects and species correspond to ideas of beauty or concern with positive traditions (for example, stork). Nowadays tradition to sow «the Crane Field» to support foraging of the autumn pre-migration aggregations of Gray Cranes is reappears. In Uzbekistan, a system of use of nut-fruit forests is based on the ancestor distribution of plots that are controlled relevant family or kin. Solicitous attitude to nature is in the tradition of Tajikistan people, and in the expert opinion many citizens became to think about the fate of nature, although this tradition is less distributed among the youth.

Other factors and causes

It is likely that *climate change* already or will influence seriously a number of countries in the immediate future. Thus the redistribution of different grass ecosystems is forecasted in Armenia. The pond and saline-land HNVFs are Under danger; climate change can result in extinction of the most part of *Vipera darevskii* populations due to habitats loss. Such natural disasters as unusual floods, landslides and desertification are considered in Georgia as the result of this phenomenon. Kyrgyzstan and Tajikistan expect during immediate years a decrease in water supply of mountain areas where many HNVFs are that is caused by decrease of precipitation and surface runoff, stronger and more frequent unfavorable weather events; a decrease in number of water springs and seasonal rivers drying is likely. In Moldova, climate change also leads to increase of extreme events, intensification of summer droughts and decrease of main rivers runoff, influencing the most vulnerable HNVFs. Some illusion about ‘usefulness’ of global warming for the country exist somewhere in Russia, what affects adversely the attitude to this problem.

Problem of irrigation and draining that is destructive on macroecological level is most known on example of the countries within the Aral Sea Basin. Thus in spite of irrigated lands take 10% of the country territory only they make the great influences upon environment of Uzbekistan and adjacent countries. That became apparent in the full destruction of some ecosystems and strong decrease of other ones. Uncovering of the Aral Sea bottom and decrease of surfaces under the natural vegetative cover have caused important changes in the local climate that became more arid and continental. Wind speeds increased and desertification reinforced. Problems connected with draining of valleys of plain rivers of the Eastern Europe are enough known. The main interventions were done during the time of Soviet Union and predetermined by non-market prices for energy carriers probably. Recently

attempts to «revive» draining or irrigation causes a trouble, being connected with the old stereotypes, or intensions to make the rapid profit despite of the long-term negative consequences.

Moldova and Ukraine have a disbalance between pastures and arable lands. It is maintained by low productivity and fixed as the consequence of antiecolological privatization.

Use of insecticides in forestry affects certainly a part of HNV farmlands, and the level of their use validity is under question as in the past. So, this is a main negative factor for Apollo butterfly (Armenia).

4. Recommendations for the EECCA region

4.1. Introduction

Nowadays it is already obvious that National Strategies and Action Plans for protection and sustainable use of biological diversity (BDAP) are poorly or badly implemented in the countries of subregion in with respect to practical actions in the agobiodiversity area. It could be discussed, however, it is absolutely clear that there are no countries that have fulfilled their obligations in relation to Kiev Resolution on Biodiversity stipulated for 2006. Anti-desertification programmes also remain only a wish on the paper or are carried out very inefficient. Unfortunately, the aims and priorities written down in those documents are not practically reflected in the tasks and actions of state programmes on rural and agriculture development. Sometimes the actual change of priorities is already seen. For example, the National Strategy and Action Plan for protection and sustainable use of biological diversity in the Republic of Belarus (1997) defines the support of “agroecological areas that are unique and large enough territories with traditional agriculture system and with other forms of management, with established biotic complex...”, and also of other ecosystems listed down as priority for biodiversity protection. According to criteria they all refer to HNVF (the listing see below). However, unfortunately, all of that is practically not reflected in the tasks and actions of “State Programme on Restoration and Development of Rural Areas for Years 2005-2010”. Similar situation is in Russia: ignoring the Ecological Doctrine and National Biodiversity Strategy of the Russian Federation the prioritized project “Development of Agroindustrial Complex” does not include nature protection targets or requirements.

It seems possible to suggest that agrobiodiversity is left out of the real focus of decision-makers in politics and economics in the countries of subregion in spite of the fact that countries joined CBD and other nature protection agreements. This is difficult to understand from long term interests of states. In the countries, where HNVF form large spaces, they play direct important role for food and economic security. And in those countries, where HNVF present as the remains of wildlife, they have the key significance for artificial agrosystems stabilization and degraded lands’ restoration.

It is important to go back to the HNVF significance for biodiversity protection that is a basis for the long term ecosystems’ existence and is a part of natural, historical and cultural heritage for future generations. At man-made landscape those territories allow conservation of majority of plant and animal species including the increasing number of endangered species on the national, Pan-European and global scale. For example, there is about 30% of animal species included in the Red Book of the Republic of Belarus that does not avoid man changed habitats (Red Book..., 2004), and more than a half of them prefers or in general is met only on such territories. Above mentioned chapters of the present document contain numerous evidences of that importance. It seems that even bigger significance HNVF have for survival of numerous invertebrate species that are not or partly included in Red Data Lists”, but endangered also.

It is easy to understand that state of HNVF could serve a clear indicator of capacity and willingness of Governments and leading political forces to finish transitional period (based on short-term goals) of post-soviet economics and social development regardless of governance methods chosen by state.

4.2. Significance of HNMF for Sustainable Rural Development

In all subregion's countries HNMFs present either main territories used for prevailing in subregion free or semi-free maintenances of agricultural animals or are the most sustainable and productive ecosystems remainders, used for grazing and haying, among degraded areas.

There are the most efficient components of landscapes on the large, especially south, part of subregion that hold back soil erosion development and fertility decrease, surface washing and irretrievable losses from transfer of organic soil matter into first order streams and seas.

In areas of concentration of arable lands HNMFs are the main places for survival, reproduction and spreading in agricultural ecosystems of:

- a) numerous species of entomophags and microorganisms that make possible to control pests and diseases of agricultural plants without intensive application of pesticides;
- b) different groups of insects-pollinators (necessary for sexual reproduction) of agricultural and many other plants; among them a relatively small group of species-pollinators is the key for production of seeds of perennial legumes that are the main component of crop rotation from the point of view of soil organics accumulation;
- c) soil invertebrate animals, microscopic plants and other organisms that are necessary for soil formation but that constantly die during as chemic so mechanic land cultivation.

HNMF are one of the main places for existence of wild forms of medicine plants used by rural people and partly transferred in crops for agroproduction on industry scale.

HNMF are the main areas where there is kept genetic material necessary for selection of:

- i) wild form of plants introduced in culture;
- ii) old local varieties of different crops, especially fruits;
- iii) old local breeds of animals often lost in other places.

In conditions of weak and uneven economical development HNMF provide poor people with the most significant life resources. In case of correct legal and economic management their use could be inexhaustible, efficient and reducing social tensions. Those resources include:

- 1) almost all types of food including such deficient ones as proteins and vitamins' products;
- 2) hygienically valuable raw materials for shoes and clothes production and also raw materials for traditional rural goods and customs;
- 3) fuel for household;
- 4) possibility for trade by genetic resources – corresponding to CBD.

HNMF create favorable background for businesses connected with production of environmentally friendly elite products and consumption by well-off people.

4.3. Significance of HNMF for linked activities (economic assessment of agricultural lands, social culture, tourism)

HNMF will have increasing significance for rising price on lands for agricultural needs in the course of creation of agricultural lands' market. As from successful rural business management point of view so for recreation development this influence will be stronger in conditions of significantly transformed landscapes. Amid unbalanced correlation of main component part price in the economic

structure of agricultural production (created by industry means of production, power carriers, biological resources and rural work) this significance of HNVP has stabilizing sense (although it is not obvious).

Rural area is a keeper of national traditions, language, folklore, folk arts. HNVP are the most important component among the conditions, supporting cultural and spiritual development. Many HNVPs represent itself widely recognized aesthetic values and play important part in ecological awareness raising and education. It is the state task to keep and develop this source.

A certain development of agro and ecotourism, that has recently taken place in Belarus, Moldova, Ukraine, Russia and some other countries, first of all was linked with already famous objects of high natural and cultural value among which the significant part of areas could be referred to HNVP. It could be positively suggested that development of this economic sector will remain insignificant and uneven without adequate assessment of HNVP importance.

4.4. Threats for HNVPs in subregion's countries and predictive estimate

better kept still large natural biotopes of open and closed types (with prevailing grass cover) prevail among HNVP by size in EECCA subregion. And there, where HNVP are presented by small remains of wildlife, their significance is especially big for its protection. That is why significance of threats to those areas could not be overestimated as for some countries so for pan Europe as a whole.

In general overview threats for HNVP of subregion could be narrowed down to six variants:

- Continuation of degradation of pastures in all subregion's countries and loss of HNVP at the expense of lands that lost their high biological value;
- Reduce of open subnatural biotopes in sectors of lowlands and low-laying bogs as the result of significant diminution of traditional hay-making and/or grazing, and connected bushing;
- Decrease in numbers and size due to transfer of lands for arable use (Armenia, Kazakhstan, Kyrgyzstan, Russia, Ukraine, Uzbekistan), or for industry including highways (Kazakhstan, Kyrgyzstan, Russia, Uzbekistan, Ukraine etc) and mining;
- Significant decrease of old-growth forest enclaves (Belarus, Moldova) and inundated forests in general (Uzbekistan and other countries of CA);
- Destruction of HNVP as a result of transformation of flood-lands and draining of bogs (Belarus), irrigation for enlargement of irrigated lands (Uzbekistan, Kyrgyzstan) and intensification of production on them (Azerbaijan) or attempts to restore hydromeliorative systems (Moldova) despite the high risk of salinity and degradation of those lands;
- Disintegration and direct losses of valuable areas due to cottages' constructions and uncontrolled development of recreational infrastructure (Belarus, Russia);
- Contamination of large areas due to development of chemical and reprocessing industries neglecting measures for preventing of dangerous emissions.

One may note also increasing pressure on subregion countries on behalf of GMO producers, in particular penetration of various sorts with heightened resistance to high doses of pesticides and probability to escape in nature.

In its turn, those processes threaten to reduce:

- Main resources for pastoral livestock farming in the countries of Caucasus, CA and an important part of Russia and Ukraine;

- Natural resources for development of ecological and agrotourism (Moldova, densely populated parts of Belarus, Ukraine, Russia);
- Life areas of wild flora and fauna intensifying not only the risks for a range of endangered on national or international scale species but also further increase of actually vulnerable species' number in all countries except Russia probably; or
- Complete degradation of genetic resources, which could be used for future restoration of damaged lands and for domestication (Moldova, Caucasus and CA).

Direct threats for HNPF could be supplemented with change of hydrological conditions in consequence of factors acting in limits of some catchments and basins, pollution from outside of HNPF, and extermination of some species because of different forms of poaching.

Experts from some countries (Kazakhstan, Moldova) but sometimes and large circles of civil society (Russia) consider forest privatization and taking out of the animal and the plant kingdoms from the category of national (public) ownership as a primary threat. It is important to outline that the question itself about the influence of ownership form does not have decisive significance. Nevertheless there is well-grounded apprehension that natural values, both from the standpoint of biodiversity conservation and economics, being established during dozens of years could be dissipated for prompt profit. State control limits this undesirable process to a certain extent.

Forests transfers into the private ownership, among other, is an assignment to take own decisions. For sustainable forestry a critical importance have the following issues:

- On which conditions the state transfers that right, and main public hopes are linked with the content of those conditions;
- How efficiently the state and the public are going to control the respect of those conditions – and this is the weakest link, taking into consideration stability and influence power of corruption that has been demonstrated by all assessment throughout last 10-12 years.

From general environment prospective the most severe consequences could be particularly for HNPFs – forest enclaves in agrolandscapes, and also for species-targets of elite hunting.

It is obvious that resulting threats include speeding up the desertification and aggravation of local tendencies of climate change together with intensification of soil erosion. This would be reflected for sure on the conditions of agriculture management at the large area of Pan-European region. Consequences are going to be the most severe in these parts of the area and in that agriculture sphere where the transition period reminds too much stagnation on the level of economic efficiency of last mid century.

In general, threat for region's biodiversity is that vast areas could significantly reduce the importance of reservoir of populations and species, many of which, probably are not even described (in Caucasus, and in CA). This reservoir stopped to be inexhaustible for a long time ago.

All these threats are obvious and to a large extent are linked with absence in general or weak state policy in relation to agriculture and rural development. There are different political and economic reasons that underlie those threats and they also are known. Less obvious is the fact that all of this is an ordinary reality. This put off public and authorities guard who stop perceiving the danger although it only increases with time.

However, the threats could appear and intensify from new mis-considered actions including those directed to situation improvement. It is absolutely clear that further development in prevailing

direction would be even bigger degradation. That is why new actions are needed together with following the existing in Europe experience of economic motivation for protection of HNPF that relates to social and economic groups, and to PAs. In connection with this the opposite action of support means, motivation and compensation to already agreed ones would be the main threat. Examples to latter are brought in the section “Economic factors”.

Specification of DISASTER. One of the main lesson learnt from mankind development is that:

- Environment degradation goes till a moment slowly (slower than career development and even shift of generations) but steady;
- Bureaucracy / management ignore alarm forecasts of scientists because they are not interested in transferring of negative information;
- Information for people responsible for decision making is filtered depending on interests, and it loses its point;
- Finally, environment disaster happens and afterwards there is humanitarian or economic crises.

This happened before famous tsunami at the end of the year 2004. The manuals of last mid century contain the need for mangroves and coral reefs preservation but all these years there has been seen their extermination. And only there, where they are preserved, disaster did not happen. It is possible that the same things existed in the Middle East where about 6000 years ago there was widespread tall grass savanna, but overgrazing changed them into deserts deprived of fertile soil. What has changed for thousands years?

It is possible to suggest that one of the main informational problems is to measure the threat. We will try to do it by taking an example of grassland HNPFs of Moldova despite the acute shortage of scientific data.

About one hundred years ago a famous researcher Pachoskoy wrote (1912) that there were almost no steppes as biome in Moldova and prevailed the communities changed by grazing; as judged by floristic composition they were mainly capable for self-restoration.

About 50 years ago there were still significant (until 300-500 ha) areas of steppe view but secondary communities able to self-restoration took already not more than 50-55%.

Currently only some small areas (from 5 till 50 ha) have steppe view, able of self-recovery communities cover 35-40% but for the last 15 years the load (and the speed of depletion) on them increased not less than twice.

Is a situation, when the rate of communities capable of restoration without direct man’s interventions is reduced till 1/3 and load on them increased, the beginning of environment disaster? Should we wait when – in 10-15 years they would almost disappear? CBD recognized the Precaution Principle that enforces us to put these questions at face of governing of all countries.

4. 5. Directions and obstacles of management for conservation and sustainable use of HNPF

The main directions of activities for neutralization of factors defining the threats in relation to HNPF, to large extent coincide with what is necessary for agricultural sector development in general:

- Filling in legislation gaps that regulate natural management (first of all, of pastures) and nature protection;
- Creation of implementation mechanisms including economic ones;
- Fighting against shadow markets of primary agricultural products;

- Elaboration of agricultural policies, oriented to long-term interests and technically justified use of HNVP;
- Development of national concept: inheritance for future generation instead of political games;
- Purposeful activities of governments in assessment and preparation to possible contemporary challenges that affect environment including economical evaluation of ecosystem services and inclusion those in budgetary calculations;
- Elaboration and implementation of methodology and monitoring system of land management for decision making in this field;
- Identification of HNVP, determination of their meaning, means of conservation and use;
- Knowledge development of stakeholders, especially in rural areas.

Obstacles and difficulties for movement in these directions are partly the same as those that thwarted the implementation of BDAP throughout the whole subregion.

1. Despite of the relatively developed nature protection legislation and participation in many international conventions on environment protection (all countries of subregion) the government's attitude to nature protection is rather declaratory than active. The absence of evident progress in realization of BDAP and Kyiv Resolution proves it for the subregion in general. A good indicator is the programmes of leading political parties of those countries where there are practically no environmental blocks.
2. Lack of environmental knowledge, poor awareness and interest of top responsible people lead to no motivation for State machinery. The obstacles connected with insufficient environment knowledge of state servants especially in agricultural sphere. Weakness of central environmental bodies (CEB) in State management field does not allow for compensation of those problems.
3. Central agricultural bodies are poorly prepared to perceive new for them problem of HNVP. There is practically no influence of CEB on agricultural ministries on the background of neglecting the nature protection rules (Moldova, Russia, Uzbekistan, Ukraine).
4. Experts outline that unfinished process of institutional reforms and legal instability (Georgia, Russia, Ukraine) lead to management and land resources protection problems. For example, transitional stage of land relations creates significant difficulties in Ukraine. On the contrary, in Moldova land privatization has completed and in accordance with liberal management concept, the ministries only define the policies in their own field. Nevertheless, the problems remain the same.
5. Difficult economic situation prevents the allocation of adequate financial and technical resources. It is relevant for Armenia, Georgia, Kyrgyzstan, Moldova, Tajikistan and Uzbekistan. In particular, in Armenia it complicates introduction of incentive taxes decrease. On the contrary, the government of Russia shows the willingness to support rural development but it weakened CEB.
6. However, it is impossible to define the policy (majority of countries) or carry out direct management (for example, Belarus and Uzbekistan) without having adequate feedback. The more so it is impossible with poor financial resources. The absence of monitoring of existing legal acts' in the field of biodiversity protection implementation and control of the agricultural lands' conditions is typical for the subregion in general and presents one of the main obstacles.
7. The absence of efficient systems of management structures' responsibility for the state of environment in front of (i) leadership of the country, and (ii) public, and also the absence of traditions of law application in the field of protection of human rights on the favorable environment also worsen the management efficiency (Moldova, Russia).

To the number of obstacles that would contribute to continuation of stagnation in economic and social sphere in rural areas in future including the worsening of HNMF conditions are related:

- a) shortage in development of infrastructure in rural areas that corresponds to time and population needs;
- b) absence of transparent real market and in particular, of lands in rural areas in some countries;
- c) low level of special instruction of many agricultural producers;
- d) worsening of rural population structure, including its aging and drain of most active and goal-oriented part.

Specific serious obstacles that need a special assessment and special actions include:

- 1) absence in the countries' political and economic vocabulary of such notions as "services of ecosystem" and their economic assessment, general lack of information in this field, in particular, in international experience;
- 2) absence and (or) weak contact with strong economic agencies / actors directly interested in conservation of HNMF;
- 3) absence of specific taxation schemes, servitude systems (less-known notion in the countries in "transitional period") and property rights transfer;
- 4) lack of EU positive influence in relation to:
 - adherence of subregion countries to more environmentally friendly standards;
 - more ponderable positions in the field of commerce of agricultural products and for agriculture within the frames of Pan Europe;
 - environmental consequences of unequal starting conditions for joining of subregion countries to World Trade Organisation.

At the same time, experts do not consider as a big obstacle the absence nowadays of the knowledge of HNMF concept. This could be overcome.

International experience of support and HNMF management. 15 EU and Western Europe countries have enough long experience in application of economic incentives and programmes in the sphere of support for HNMF and PAs, and also their legal accompanying. New EU countries also got a certain experience during the joining process. This experience includes the achievements and failures that could be taken into consideration by subregion countries. Unfortunately, in those countries this information is almost unknown because it had been addressed to another circle of countries, also because it had been perceived as something "from another planet" and due to language difference. More than that, inclination to generalization of "best practices" and informational gaps in relation to mistakes would lead to recurrence of namely mistakes.

In particular, the most important questions in the implementation are:

- Necessary conditions in order direct economic support of rural areas would not turn out as (1) pressure intensification on natural resources and HNMF, (2) support for stagnation or (3) economic parasitism;
- Corruption prevention in the conditions of such support and its use only for political aims;
- Conscience attitude to ownership rights instead of widespread slogans like "public, or on the contrary, private ownership is sacred".

Experience of support and management of valuable sites, including HNMF farmlands, in the EECCA countries. Of course, such experience is limited. Nevertheless one may distinguish five

variants of options that are vitally important in conditions of underdeveloped state systems for support of biodiversity and properly HNV farmlands; sometimes NGOs or state projects financed by international donors, but sometimes representatives of cultural or business elite initiate these opportunities.

Explanation of important natural heritage and seeking the support from leaders of local communities. Patronage for nature conservations is more effective in regions where tradition of respect for such leaders is strong, e.g. in Uzbekistan (Navoi oblast); in that case conservation of subjects of conservation and wise use of natural resources may become a tradition also.

Revitalization of old environment-friendly tradition as the sowing of the Crane Field in Russia that is a specially created of remained partly unharvested grain crop in sites where big Crane flocks stop during migrations. A tradition could be other, but it requires some expenses therefore position of local leaders is very important also.

Provision of somewhat local privileges of land use to families and groups of families simultaneously with their commitment to protect a natural place. Implementation of such measures depends on local administration and could be confirmed though a contract.

Attaching of parcels of state or communal (public) land to certain families for harvesting (of fruits, nuts, medicinal or spicy plants), limited grazing, haying and / or collecting of firewood that is accompanied by obligation to observe rules and provide protection of natural objects within the attached parcels. Implementation of such measures also requires activities of local authorities and could be confirmed though a contract.

Rent or other payable use of valuable natural areas that is made by tourist entities in order to show the nature and local traditions etc, when the local community receives direct profits from appropriate state of these areas.

4.6. Strategic and tactical tasks, recommendations and practical suggestions for conservation and sustainable use of HNVF

The common issue for all countries is that the concept of HNVF is practically unknown, there is lack of data on many points and, accordingly, no interested public. Stakeholders do not generally recognize principles and methods for HNVF's identification and conservation. Aims and tasks for HNVF's identification and management mechanisms in the frame of contemporary and future stages of social and economic development are not laid down-including with the participation of CEB and agricultural bodies.

It is important to outline that *strategic aims and tasks* laid down by experts are essentially coincide with those of the First European Session of Global Biodiversity Forum (EGBF) (http://www.gbf.ch/present_session_old.asp), Chisinau, 2003.

For purposes of realization of Pan-European Biological and Landscape Diversity Strategy and considering the key problem of the integration of biodiversity conservation into policies of financial and private sectors as well as into the general social and economic context, EGBF session has recommended⁹:

- i. To include issues of biodiversity conservation and its indicators in the state programmes on social and economic development;

⁹ The interesting fact is that those recommendations were mainly ignored even in the frame of Environment Strategy of EECCA; the issues of biodiversity conservation and its indicators were included in the the Economic Growth and Poverty Reduction Strategy adopted in Moldova for years 2004-2006 but later forgotten by the Government

- ii. To develop and introduce in the land use system institutional, legal and economic mechanisms for the forming of an institute of environmental servitude;
- iii. To use in macro and micro economic development assessment indicators the conditionally renewable nature capital as an important measure for conservation of regional, national, subnational and local richness;
- iv. To develop and practically apply an ecological and economic assessment of biodiversity in the calculation of compensatory payments for damage caused to wild nature by economic agents in different sections including agriculture applying “polluter pays principle”;
- v. To use with a view to wild nature conservation the mechanism of external debts restructuring in the recipient-countries following the pattern “debts in exchange for nature”, connected with real efforts of State implementing this aim.
- vi. To introduce the special register of high nature value lands in cadastral, urban development charts and sectoral documents applied in territorial planning; to restore and strengthen the monitoring system of agrolandscapes as a basis for rural planning;
- vii. To aspire for unique systematic approaches’ and procedures’ application in biodiversity inventory and assessment including those on the basis of standardized indicatory sets and endemism assessment;
- viii. To strengthen the role of local people in agrolandscapes biodiversity protection, publication of information materials and manuals.

Experts from subregion countries, taking part in the project, consider that it is necessary:

- To recognize politically and stipulate legally the concept of agricultural lands’ multifunction, to remove from the legislation the provisions that provide for arable land priority before other lands;
- To develop the registration system of agricultural lands that takes into consideration their multifunction significance, development and introduction into practice of record and reporting forms that allow for identification of HN VF among them, and the conditions of natural and sim-natural ecosystems;
- To hold the concrete responsibility for the land-users for the quality of use including for the HN VF conservation, and to limit the use within HN VF together with tax incentives;
- To inform about national and international significance of HN VF and ecological networks in general for the biodiversity conservation as well as about biodiversity significance for sustainable development – that should be directed to decision making (responsible) people and public;

As priority tasks, the project participants recommend:

- i. To recognize identification, protection and sustainable use of HN VF as priority, to speed up the creation of relevant SPNA and ecological networks, first of all for such ecosystems as savannas, steppes and (semi-)deserts using management plans as the management basis;
- ii. To introduce the notion of HN VF and provisions of extrinsic value of the most important of them in the laws on PAs, Land, Forest and Water Codes of subregions’ countries and to include the HN VF in the number of objects taken into consideration during territorial planning and environment impact assessment;
- iii. To elaborate urgently and launch management plans for HN VF that are already a part of PAs Funds;
- iv. To establish management section or authorized people responsible for HN VF conservation and management within the CEB or central agricultural bodies in subregion’s countries;

- v. To introduce the sections on HNMF in the state programmes on agricultural development and national action plans for biodiversity conservation, fight against desertification and land degradation with established financing for concrete projects;
- vi. To elaborate the common for region's countries methodical basis and to fulfill programs on identification of HNMF in each subregion's country;
- vii. To study possibilities and methods of record for **lands under agrienvironmental schemes** and **less favored lands** with HNMF's quality and also the mechanisms of economic motivation;
- viii. To elaborate the requirements for investment policy in agriculture with the links to agrobiodiversity conditions as a basis for agriculture sustainable development and including biodiversity support as one of the main criteria for selection of investment object;
- ix. To elaborate and to introduce in present legislation the provisions on grazing lands' norms and concrete obligations for biodiversity conservation on agricultural lands that are in ownership, use or possession;
- x. To introduce those provisions, as a rule, through legislative acts taking into consideration the interrelation of different ownership forms (for example, grazing of private livestock on state lands) and also using step by step introduction and tightening of sanction for breaches;
- xi. To pay special attention on the development of scientific basics for restoration of biodiversity components and damaged ecosystems introducing this direction in the financial programmes that are done on account of CEB and argo-ministries;
- xii. To define clear tasks and terms for tax and rent policy development for biological resources use and conservation;
- xiii. To control the procedure or the results of agricultural lands privatization –depending on the stage – by the court system regarding the lands that are under nature protection legislation and to take measures for its respect.

Expressing deep gratitude to the Government of Norway that has supported the project that became pilot project for EECCA countries, the participants propose:

1. to pay special attention of countries and donor-organisations on realization of Kyiv resolution on biodiversity, in particular in relation to agrobiodiversity;
2. in particular, to support the development of common identification procedure for HNMF in collaboration with UNEP, UNDP, FAO, ECO-Forum and IUCN and also pilot projects for assessment, management plans elaboration and measures protection implementation, on sustainable development and ecological restoration of HNMF;
3. To evaluate the activities of participant countries in implementation of Kyiv resolution and PEBLDS actions plans during the Belgrade ministerial conference "Environment for Europe";
4. To introduce a special section in Environment Strategy EECCA dedicated to the support of HNMF and development of ecological networks;
5. To assess together with the EU the impact of agricultural policy on conditions of agriculture sustainable development and HNMF conservation on Pan-European space;
6. to introduce preferences for the projects that support HNMF by the main international organizations supporting agricultural development in the countries-recepients (World Bank, International Development Association etc.).

Project participants call subregion's countries to provide measures on implementation of practical monitoring of agricultural environment state including biodiversity and on creation of relevant data base systems as it was provided in the Republic of Belarus for the years 2006-2010.

BIG of ECO-Forum call non-governmental organizations to take part in:

- lobbying of legislation development in relation to HNMF and public control over implementation;
- organization and elaboration of independent awareness campaigns and support for state bodies in that direction;
- implementation of the projects for HNMF inventory and development of their system and also the monitoring of HNMF especially on the local level;
- carrying out of special projects aimed to protect biodiversity on agrolandscapes through changes in agricultural practices;
- stimulation of more active position of CEB in relation to protection of biodiversity in agrolandscapes and also for close cooperation with agricultural bodies;
- to apply the IUCN initiative «Countdown-2010» in these directions, in particular by members of IUCN.

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