

ECOSYSTEM SERVICES AT GYULA SITE AS PERCEIVED BY LOCAL PEOPLE

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Project objectives

The objectives of the study discussed in this paper was the same as in previous paper about „Ecosystem services at Magyaresanád site as perceived by local people”: assesing how local stakeholders value the natural environment they live in, what is their relationship to it and what they find important for their well-being and life. As already mentioned in the previous paper, the theoretical background of this research was the concept of ecosystem services. We defined ecosystem services as follows: *ecosystem services are the benefits human populations derive, directly or indirectly, from natural and human-modified ecosystems* (MEA 2003). So this definition from the Millenium Ecosystem Assesment describes our goal in this research as already mentioned earlier.

The area of the research

Geographical site description

Two study sites were chosen for developing a habitat evaluation system and assessment of ecosystem goods and services in HURO/0801 program. One of these sites is located near Magyaresanád, at the River Maros (described in the previous paper in this book). The second study site is located between Gyula and Elek settlements. The area is the central and northern part of the alluvial fan of the River Maros. The plain slightly slopes to the floodplain of the River Fehér-Körös. The potential vegetation is a loess steppe matrix on chernozemic soil, containing several islands of alkaline steppe and wetlands as well. The good quality, black, chernozemic soil areas are used for agriculture (arable lands), but the natural grasslands and meadows remained where the salt content of the soil is high, and temporally too wet. Mean annual temperature in Gyula is 10.2 °C, mean annual precipitation is 581.3 mm (Ambrózy and Kozma 1990).

Ecological description

Two neighboring near-natural alkaline grasslands were chosen for detailed botanical investigations. They are separated by the Hungarian-Rumanian state border. The grasslands are between Gyula and Elek on the Hungarian side and

southwest of Várşand (Gyulavarsánd) on the Rumanian side. Distance between the two grasslands is approximately 1.5 km, and abiotic parameters are nearly identical (Erdős et al. 2011a,b).

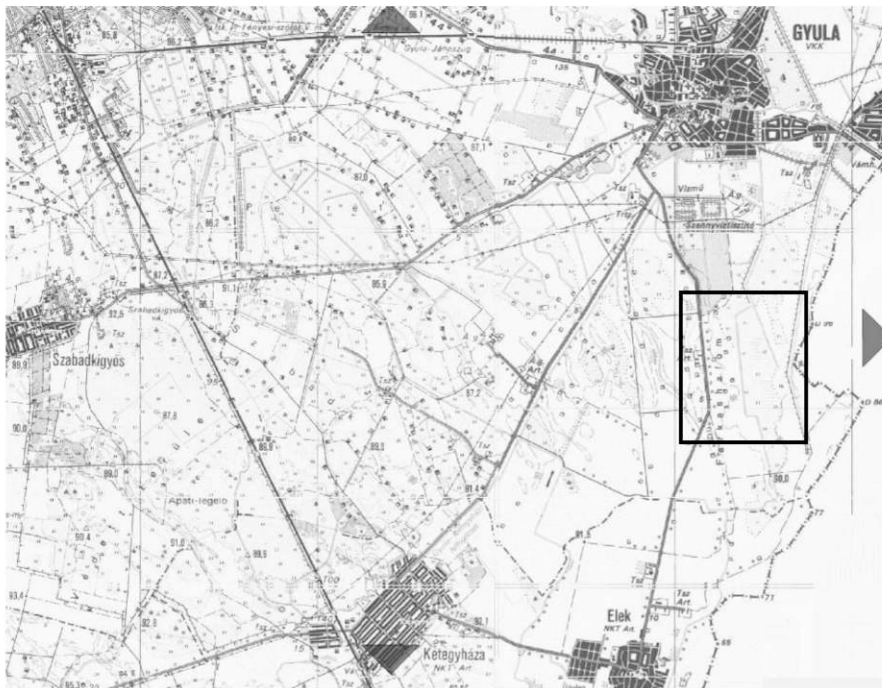


Fig. 1. Present map of the studied area between Gyula and Elek settlements (only the Hungarian part). The border of Hungary and Romania runs on the eastern side of the map. The rectangle shows the location of detailed vegetation survey (Erdős et al., 2011). (www.mepar.hu)

The habitat map of a sample site, representing the whole landscape, can be seen at the page 99 of this book (Fig. 1.; Erdős et al. 2011b). Table 1 summarizes the habitats investigated.

The dominant habitat type is salt meadow (F2) It is a tall grass meadow that have seasonal water cover at the beginning of the vegetation period and developed on solonetz or solontsak meadow soils. Characteristic grass species: *Agrostis stolonifera*, *Alopecurus pratensis*, *Beckmannia eruciformis*. Dry grassland patches and salt marshes forms island in the salt meadow matrix. Dense and tall *Puccinellia* sward patches develops on the especially wet and salty areas. Farmhouses forms line between the road and the grassland.

The botanical study indicates that this grassland is important and valuable from a nature conservation perspective. Because of the extent of the natural and

near-natural patches, the occurrence of valuable plant communities and some rare animal species (e.g. *Acrida hungarica*, *Asio flammeus*), it would be reasonable to protect the studied grasslands on a higher level.

Table 1. The codes and names of the habitat categories found in the sample area in the Hungarian side.

Code	Name
B6, BA	Salt marshes and fine scale mosaic or zonation of marsh communities of channels, ditches and artificial lakes
F1a	<i>Artemisia</i> salt steppes
F1b, H5a, OC	Mixed dry grassland with the plant species of loess and <i>Artemisia</i> steppes, and other indifferent species.
F2	Salt meadows
F4	Dense and tall <i>Puccinellia</i> swards
P2b, S1, S2, S3, S7	Tree plantations and spontaneous shrublands.
T1, T10	Arable lands
U3, U4, U10, U11	Antropogen areas (settlements, dumps, farms)
U9	Lakes

The history of land use

In the pre historical time this area probable was a large steppe with some forest and wetland patches. Large body ungulates grazed here, and the domestic animals of *Homo sapiens* replaced them later. Animal husbandry and pasturing was present in the middle ages near the town Gyula, and this remained the main land use type until the middle of the 19th century (Scherer 1938).

The map of the First Military Survey in 1784 shows grasslands (puszta) near Gyula, but there are large arable lands on the south of it. Wetlands are very typical in the pusztas. (cf. Fig. 1. p 11. Cseh et al.)

Eighty years later the map of the Second Military Survey in 1864 shows a mosaic of wet meadows and arable lands. The landscape pattern in the area of detailed vegetation survey almost has not changed from this time: the contour of the meadow is nearly the same. The name of the area is Farkas halom vagy Kis Pili Dűlő. The row of farm houses can be found along the road between Gyula and Elek even in this time. The suitable areas were ploughed, and the wet and/or salty areas were used for grazing or mowing. The control of the River Fehér-Körös started, it runs in a straight channel near Gyula. There are some salt lakes between Gyulavarsánd and Nagypél, on the present Rumanian side. (cf. Fig. 3. p 15. Cseh et al. 2011)

The so called “szilaj” husbandry was very typical in the Hungarian puszta for centuries. The animals (mainly gray cattle) and the shepherds lived out, on the pasture whole year. In the late 19th century the stalling husbandry developed instead of szilaj husbandry. The farmers bought new breeds instead of the old, stout and unpretending breeds, but they have to produce fodder for winter feeding the animals. At the beginning of the 20th century mainly cattles and horses grazed in the pastures around Gyula, the importance of sheeps decreased (Dóka 2006).

During the socialist period (between 1945 and 1990) the agricultural land use were organized by a collective farm and a state farm on the fields between Gyula and Elek. The alkali grasslands were grazed intensively. The collective farm has about 200 beef cattle, the state farm has 400 ones, and 50-60 sheeps as well. The state farm was ended in 1985, and the collective farm in 1990.

Present land use and nature protection status

After 1990 most of the fields were privatized. For example, 266,5 ha of the botanically investigated grassland are in private ownership, 24 ha in common (several private owner), and 5,5 ha in state ownership.

The soil quality is good, and the main crops on the ploughlands are wheat, maize, sunflower and rape. Intensive agriculture (using large machines and chemicals) is common. Most of the alkali grasslands are not used, because the animal husbandry became rather uneconomic after 1990. The land owners can get agricultural subsidy, more on the arable land, and less on the grassland.



Fig 5. Nature protected areas. Dense grid: national park, cross-hatch: Natura 2000 area.

The Kígyósi-puszta belongs to the Körös-Maros National Park, it is more than 10 km to south-west direction from Gyula, so it is outside our study area. Between Gyula and Elek there is no nationally nature protected area, but almost all of the remained alkali grasslands are designated as Natura 2000 area, as “Pannonic salt steppes and salt marshes” habitats.

There is no conservation management on the studied area, but the Natura 2000 rules and subsidies try to drive farmers and land owners to maintain the natural values by moderate grazing and mowing. Several land owner does not like very much these rules.

Evaluation method

There are several methods in use currently to measure nature in general and the role of ecosystem services also. We decided to use qualitative method instead of quantitative one. We rejected quantitative methods for example cost-benefit analysis although it is regarded one of the most popular technique in environmental economics (Hanley and Spash 1993). Our reasons in this decision were already mentioned in detail in the previous paper about Magyarcsanak site. But the main reason was that qualitative methods better fits to our aims in this research, because they provide an in-depth explanation of valuing the nature by local people (Babbie 2008).

The research took place during the summer of 2010 and January 2011 altogether 28 in-depth semi-structured interviews were conducted with local residents and land users about the ecosystem services they perceive. As already mentioned in the Magyarcsanak site students of University of Szeged were taking part of this project. Our main topics was: (1) life and work of the subject (2) local life options, farming possibilities, (3) natural values of the area, and (4) changes of the natural environment.⁶ As already referred and reasoned in the previous paper we paid special attention to formulate questions that do not remind our subjects directly of the field of environmental protection and nature conservation. We were avoiding to mention the green aspect of the research because today environmental protection and nature conservation have become social expectations so what people tell in a survey may differ significantly from what people really think about certain subjects or how they would really act in certain situations (Babbie 2008).

We carried out our survey in Gyula site in two phases resulting in 16 interview summaries. The first round of the subjects was selected with the guidance of the national park service ranger and further subjects were chosen with the snowball sampling method. Compared to Magyarcsanak site, locals were more suspicious: a lot of people refused to give an interview or even if

⁶ For detailed interview scheme see appendix 1. in the Magyarcsanak site

participating they expressed themselves less openly, often sharing just a restrained opinion.

Out of the 16 interviews 10 were conducted with farmers (V1, V2, V6, V7, V8, V9, V13, V14, V15, V16) and 6 with locals with a different professional background: local politicians and water authority colleague, a national park service ranger and a member of a local hunting society (V3, V4, V5, V10, V11, V12) in short called non-farmers.

Results: inventory of the ecosystem services perceived by locals

The typology of ecosystem services used in the research was developed based on the Millennium Ecosystem Assessment (2005) as already discussed in the previous paper. MEA distinguishes four types of services: provisioning services (e.g. food, raw materials, fodder), regulating services (e.g. climate regulation, protection against floods, pollination), cultural services (e.g. education, recreation, artistic inspiration) and supporting services (MEA 2005) as you can see in Table 2. Our study follows this structure about the four types of services.

Provisioning services

Food production: crop production and animal husbandry

We found that the most significant provisioning service is food production around Gyula: crop production and animal husbandry as described by a local farmer and a member of the city council:

„Mainly wheat, maize and alfalfa are produced here, sometimes sunflower too. In the past they used to produce barley and oat as well.” V8 farmer

„Livestock production can be characterized by swine and cattle.” V11 local politician

However we observed a shift in traditional crop production and animal husbandry: a lot of our subjects agreed on that animal husbandry is not profitable anymore, even those who used to earn a living with it have rather switched to crop production:

„You can't make a living of animal husbandry anymore, so people have switched to crop production.” V1 farmer

„There used to be much more animals in the area. One easily made a living of animal husbandry, today it's not possible anymore because the value of milk and meat has fallen.” V1 farmer

„One can't make a living of livestock production anymore nowadays: everyone who keeps animals is stupid, me too. There is no money in it at all and I'm still doing it.” V6 sheep farmer

Table 2. Ecosystem services in functional alignment

Provisioning services	Food Fodder Energy source, fuel Timber or other raw materials Biochemicals, natural medicines and pharmaceuticals Genetic resources Ornamental resources
Regulating services	Air quality regulation Climate regulation Water regulation Flood protection Erosion regulation Regulating species reproduction Break down of pollutants Pollination Pest control and disease protection Storm protection Protection against noise and dust Biological nitrogen fixation Conservation of nature and biodiversity
Cultural services	Cultural, historical and spiritual heritage values Scientific and educational services Recreation and ecotourism Aesthetic values Other cultural or artistic information, inspiration „Sense of place”
Supporting services	Soil formation Nutrient cycling Primary production

Source: MEA 2005, Hein et al. 2006

„Cattle-breeding is more popular in this area. Pig keeping used to be typical but it isn't worth anymore. Those who keep animals today also produce the fodder themselves.” V6 sheep farmer

„Local livestock has dropped very much, most dairy shops have closed.” V8 farmer

„There is not much animal husbandry here” V3 national park service ranger

„Less and less people make a living of agriculture. Crop production dominates over animal husbandry” V5 non-farmer

„Last year the number of our bee colonies have fallen from 90 to 50. We have sold them because it is less and less worth it.” V13 bee keeper

As we can see from the above, our subjects still value the environment from the perspective of food production despite animal husbandry being less and less profitable. However the bitterness and disappointment of their comments on agricultural possibilities was striking. Despite the current situation there is still a lot of people who earn a living or produce an additional income by agriculture:

„It’s impossible to make a living of agriculture alone because the most necessary and basic market conditions aren’t given. So agriculture just provides a side money for most people.” V14 farmer

„It would be possible to practice agriculture, but farmers go bankrupt, smallholders are still trying but it’s hard.” V4 non-farmer

„Despite the falling prices there are still many people working in agriculture in the area.” V 14 farmer

„Most people have white collar jobs (for example clerk, civil servant), but on the outskirts many earn their living with agriculture,” V3 national park service ranger

„In the present circumstances future seems so hopeless that I wouldn’t recommend farming as a lifestyle to my children even if it was something they wanted to do. Within a few years, as soon as my smaller child grows up as well, I would like to move to Austria or Switzerland.” V15 farmer

„There were times when we weren’t able to sell the honey so we collected it in a barrel. It was almost a hundredweight.” V13 bee keeper

„I used to produce sugarbeet but I found myself in a trouble because the sugar-works in Sarkad closed (just like all the other sugar factories) so there was no market for it anymore.” V16 farmer

„Less and less people can make a living in agriculture or in the industrial sector lately.” V11 local politician

„They hardly get by.” V5 non-farmer

„We try to make a living as farmers but we hardly get by. It only works if we do certain things illegally, for example we employ black workers from time to time. I’m also a bricklayer but it’s hard to get a steady job in the area in this field, just a temporary black job. In winter I work for an Austrian land owner for a month or two.” V15 farmer

„There are no jobs in the region apart from agriculture and there are many people on a government aid.” V15 farmer

This attitude is only indirectly related to the perceived ecosystem services but being a determinant a determinant opinion it’s worth mentioning:

„Agricultural regulations are very hard on farmers. They make a fuss about the smallest details. I can’t keep fertilizers on the edge of my land, I have to move it after two months even if it’s just 10meters because they keep checkin by satellite.” V1 farmer

„It’s very hard to get a subsidy and it’s just the bigger properties that are supported.” V1 farmer

„The EU and the US have destroyed our agriculture (economy) on purpose. The aid is not distributed well, it doesn't reach the laymen. The system of the EU subsidies is not working either, it is worth bringing goods here from distant regions of the European Union and this destroys production in Hungary. Western corn rootworm got to Hungary with a reason, we have to buy American hybrid corn.” V1 farmer

„The area has also been hit by the flood of cheap products from abroad that push down the already low buying-in prices making local farmers non-competitive. The production cost of milk is moving around 70 HUF/l while the one and only purchaser offers 30HUF/l for the product, less than half of the production cost. The 300 HUF/kg buying-in price of pork is also 300 HUF less than the production cost. It's the same with eggs: foreign eggs are cheaper (18 HUF), local ones are more expensive (25 HUF). We manage to sell our sheep to Italians.” V14 farmer

„You can't ask the cow to wait while you are forming a queue for the papers” V1 farmer

„Sure, Budapest needs the new metro but we also need to get to Kecskemét and Szeged somehow.” V1 farmer

„You need more and more advertising to be able to sell.” V7 farmer

„It used to be possible to keep chicken in the city, today you can't because the crowing disturbs the neighbours.” V7 farmer

„The government doesn't support us. There is a lot of fraud.” V13 bee keeper

„Once several colonies were stolen. The damage was 300 thousand forints. We called the police but they said there was nothing they could do.” V13 bee keeper

„Good drugs have been withdrawn now we are forced to bring in from abroad... These regulations were invented by someone who has never seen a bee.” V13 bee keeper

„In my opinion it's just the ones with the good connections that get the subsidies. It's just requirements that come from 'up above', instead of purchasers or assistance.” V15 farmer

„The EU subsidies don't provide a solution to the problem because it's just a temporary help keeping the farms barely alive without the possibility of development.” V16 farmer

Due to unfavourable regulations farmers do not sympathize with ecological agriculture although it's only mentioned in two interviews.

„It's easier for the owner of the ecological farm to get the subsidy because it's called 'ecological' (for example for biogas) although they buy their fodder treated with chemicals from us.” V1 farmer

„I have tried ecological bee-keeping too but it was not worth, there was too much paper work and injustice. The honey barrels weren't bought back. We had

to get a map about the area where the bees collect and this made the job very difficult, we had to queue a lot at the municipality.” V13 bee keeper

Besides excessive bureaucracy and regulations considered unnecessary by farmers our subjects find that the other reason for the unfavourable conditions for agriculture is the present, very concentrated land ownership structure. Most subjects agreed on production on small family farms and patchy landscape being better regarding agricultural production and the environment as well.

„What is going on is constant centralization in agriculture but it is driving us in a good direction because while a few get rich, the others are getting poor, many fall out of farming, it isn't good on the long run.” V8 farmer

„After the privatisation of the cooperatives the lands were bought by those in higher positions and now all that land belongs to 2-3 people who get the work done for low wages and with just a few workers. The smallholders „of three cows” that were left I has all gone bankrupt because there is no purchasers anymore and there was noone to accept smaller quantities of produce anymore.” V14 farmer

„The current situation should be kept and state land should be distributed to beginners to provide them with a source of income.” V8 farmer

„Agriculture disintegrated after Trianon. A concentrated system of ownership has taken shape. There are 4 large estates in the area (of several hundred to thousand hectares) and a few family owned lands (50-100 hectares). The latter ones are being eliminated gradually. A lot of land is uncultivated because it is not profitable.” V10 local politician

„Agriculture is weak due to the fact that people don't join forces, don't cooperate. It is a 'good' old Hungarian tradition that everybody struggles alone, everyone just works on their small, fragmented lands.” V11 local politician

„More and more land is concentrated in the hands of single owners, the area is more and more homogeneous.” V1 farmer

„I believe in patchy landscape. There should be an adequate rate of ploughland and grassland. It isn't a livable landscape where there is ploughland alone. Microrelief is an important value in the area as well.” V3 national park service ranger

Sense of isolation is typical among farmers, partly stemming from the inappropriate structure of subsidies and their small amount. However, the wish for independence, will to strive, abiding by agriculture also appears in the interviews:

„I don't need the subsidy, they should just restore the prices of meat and milk proportionally so that it's worth working” V1 farmer

„There are always new problems popping up, new diseases, new pathogens but we have to fight it and if the crop rotation is respected there will be no problem.” V1 farmer

„I'm a mechanic originally. I have learnt everything by myself without anyone's help.” V6 sheep farmer

„You have to work instead of living off government aid.” V7 farmer

„We shouldn't forget that we are capable of independence.” V7 farmer

„I think it is possible to make a living in agriculture, because if you love doing something, especially your job, you can make a living with it.” V9 farmer

Let's close the part about the agriculture of Gyula and the food production services of the region with the opinion of one of the city's leaders making it clear that the city would like to give more importance to agriculture as well:

„We assess what kind of local cultivars are worth re-introducing. We have a tender in progress to build a road to the region. We must have a multi-faceted approach that's why we are trying to open to agriculture and produce and popularize local varieties.” V10 local politician

„The city has spent the one billion HUF (3,779,877.19 Euros) of government aid for the wrong things: instead of supporting production office blocks were built.” V10 local politician

Fodder

The most significant fodder related provisioning service around Gyula is mainly grazing for the people interviewed:

„The lands where my animals graze are on the south to Gyula. Good alkaline meadows where mowing is possible too.” V6 sheep farmer

Grazing turned out to be an ecosystem service that farmers find important and they are missing it:

„In the past the roadside lands were grazed for money. Today a lot of meadows could be grazed but animals are rather kept in stables.” V8 farmer

„Meadows used to be grazed in the past, but not anymore.” V7 farmer

The national park service ranger has mentioned the same problem: grazing would be beneficial environmentally and economically as well:

„Grasslands should be grazed. There are 700 cattle in the grassland of Szabadkígyós. Extensive grazing is cost-effective and animals are healthier too, so it is economically good, while it sustains the succession stage of the grasslands. It brings back grassland species such as Eastern imperial eagle, red-footed falcon, European roller.” V3 national park service ranger

Other provisioning services

Besides production of food and fodder occasionally other provisioning services occurred as well. One of these services was biogas as an energy source:

„Here is the country's largest organic cattle which can produce biogas also” V11 local politician

An other ecosystem service was the timber of the local forests mentioned by a local politician and the ranger but not by farmers:

„There are significant areas of forests with a great employment potential.” V11 local politician

„A lot of people earn a living with agriculture, a few dozens with forestry.” V3
However there are less and less forests and growing rate of related abuse:

„The area of forests has decreased significantly in the past few years, decades. I think this is the reason why there are more and more birds of prey on my lands causing serious damage in the poultry stock” V15 farmer

„It is not worth to plant a forest because the wood will be stolen.” V1 farmer

Natural medicines accrue in the area too in the form of medicinal water. It has only been mentioned by one of the subjects despite Gyula being famous for its spa:

„Water cure is important” V4 non-farmer

Biodiversity has also been mentioned during the interviews though only by two subjects and not with little emphasis:

„There aren't many protected plants here, but a few characteristic species like hog's fennel or *Plantago schwarzenbergiana*. In the forests by the river Fekete-Körös alpine plants can be found, too.” V3 national park service ranger

„The areas that aren't being mowed have a rich fauna. Although they don't bring a profit (deers are rather bad for agriculture), I love them still. Such a land is for example the Péli pasture that is nearly 150 hectares.” V1 farmer

Regulation services

The only topic mentioned which is close to regulating services was that forests keep the air clean. So from the survey it appears that the subjects don't perceive these services:

„The city is relatively clean, there is no problem with the air either, the forests keep it clean.” V4 non-farmer

Cultural services

A number of subjects talked about tumils around Gyula and a farmer mentioned the castle. Crafts was also perceived as a local cultural value:

„Farkashalom used to be a tumil that has been bisected during the road construction.” V2 farmer

„It's outrageous that the city has raised a tree of life and constructed a recreation space by a kurgan but the owner ploughed up part of the land so bones and other archeological values came to the surface that I had to collect myself with the help of a friend in order to save them from getting lost in the ploughland.” V10 local politician

„I make wood carvings in my free time.” V2 farmer

„There are many kurgans in the area, rather around the rivers Körös. Conservationists have placed wooden headboards next to them and there was a

regulation made prohibiting it to plough them or mow them. Kurgans are said to be burial places but some say that our ancestors set signal fires on the top of them to send messages to each other. Such hills are for example Kápolna hill or Gyürkchelyi hill.” V16 farmer

„There are some very beautiful places in the neighbourhood (for example the castle) that should be cleaned up in order to attract more tourists which would bring money.” V2 farmer

Tourism is an important cultural service in Gyula, however, its current state is perceived in a positive way only by non-farmers:

„The city is improving tourism.” V4 non-farmer

„The situation of tourism has somewhat improved by Romania joining the European Union. More and more tourists come from there, not so many from the west.” V4 non-farmer

„Tourism is one of the most important sources of income here. The main attractions are the castle bath which is open all year round and the various programs: castle theatre, castle games, festivals: pálinka festival, slaughterman festival.” V5 non-farmer

„Tourism was blooming in the nineties but lately there is a decline in it too” V4 non-farmer

Our subjects didn't agree upon the question of tourism. As opposed to the non-farmers farmers were rather disapproving of it because in their opinion it surpasses agriculture too much:

„Tourism bothers us because it impedes livestock production in the city.” V7 farmer

„It's only tourism that counts in the city not agriculture.” V8 farmer

„The current leadership of the city sees a possible source of income and an opportunity for jobs in tourism and that's why they are improving it. The problem with it is that it's only making a very few people rich, it provides a source of income for just a very few which doesn't help us fight unemployment, it doesn't provide jobs to those who used to work in the agricultural and industrial sector.” V16 farmer

The two local politicians that we have interviewed have a different opinion on tourism. One of them sees the future of the city in the development of tourism while the other one would also support agriculture:

„We run a lot of tender processes to promote medical tourism. [...] The city's strategy is the development of medical tourism, we have renovated the castle bath, new hotels are being built.” V11 local politician

„Besides tourism the city would like to support agriculture, [...] Cultural programs don't bring enough money. [...] [Békéscsaba has always been riding the western winds; they have strong western connections. (For example the marketing of Csabai sausages is a lot better than the Gyulai's.) Gyula, on the other hand, has rather had connections to the east with cities along the Körös rivers where fruits

were produced and animals bred and countrywide famous markets were held. But the Treaty of Trianon has cut those connections and the city had to seek a new role and it was believed to be tourism. Was it a good or a bad decision? That's an other question. We should turn more towards agriculture." V10 local politician

Supporting services

The only supporting service mentioned was good quality soil:

„Soil has a good quality here, it didn't fall pray to large scale agriculture.”
V10 local politician

No more supporting services have been mentioned by our subjects but in two fields nature appeared as an obstruction, a hostile force instead of being supportive: one of which was extreme weather conditions and the other is the problem of excess surface water:

„More and more pastures dry our weather gets hotter and hotter.” V1 farmer

„One year there are pastures, in the other there aren't. Once there is draught, while in other times egyszer szárazság jellemző, máskor nedvesebb időszak van”
V6 sheep farmer

„The weather is changing constantly, it's extreme. 2010 was a very rainy year.” V13 bee keeper

„This year it's very hard with the bees, they bite, they attack a lot. It's probably because of the changing weather conditions. It has been worsening for about 3-4 years..” V13 bee keeper

„We can't improve with such an unpredictable weather.” V13 bee keeper

„This is the „storm comer” of Hungary, weather conditions are often extreme here. Lately it was the large amount of precipitation causing the trouble. There are channels to drive away excess water but they aren't in a good state. The alkaline lands can not be used, they aren't cultivated, there are grasslands only, so the most one can do there is mowing. The waste water treatment plant is near the alkaline lands (this also belongs to our company). In the past poplars were planted there to absorb the water but this way soil became polluted as well, and it is a very laboursome method, today waste water is cleaned with modern, automatized technology.” V4 non-farmers

„Weather has become more extreme. Lately there have been several hot periods, summer stroms are more intense, there has been more precipitation in the previous months.” V5 non-farmer

„Changing weather is making agricultural production harder and it is not good for grasslands either to get covered by water.” V14 farmer

„Climate is changing, seasons are shifting, weather conditions are harsher and harsher. To sum it up, the state of the land is going to deteriorate in the future.” V15 farmer

Problems related to excess surface water were mentioned by a number of subjects, although it appears to be a settled issue, because reservoirs and dikes are functioning well:

„Excess surface water has been a problem since the 1950-s, like for example in the case of the castle in Póstelek. A lot of things get destroyed, time destroys a lot of things and also people who don't manage things well.” V2 farmer

„There is excess surface water. Big and strong dikes were built along the Körös rivers. Between the dikes there is a reservoir.” V7 farmer

„Excess surface water has appeared but my land is not really affected.” V9 farmer

„Lands around Gyula mostly have excess surface water” V14 farmer

„A lot of fodder and protected plants perished because of excess surface water.” V14 farmer

„There were a lot of problems with excess surface water between 1999 and 2002, this year it rained a lot but it didn't mean trouble until now. We are in serious trouble if the creeks of Maros fill up with water. Elders say that there used to be more water in the plains and it meant no trouble. The farm houses were built on the hills so they weren't flooded.” V3 national park service ranger

„The floods of the Körös rivers were dangerous, Gyula always good flooded but lately we have no problem with it, we have good dykes and a reservoir.” V11 local politician

Other results

Besides the ecosystem services perceived by locals, our survey has revealed conflicts, attitudes, problems that can only be related indirectly to the services provided by nature. These problems also part of the results so we feel that we need to mention them:

Processing industries in Gyula

Local processing industries are only indirectly related to ecosystem services processing raw materials but they were often mentioned together with agriculture. Similarly to crop production and animal husbandry our subjects felt disappointed and mostly agreed on that local processing industry is declining:

„Meat can be sold to the meat factories. The meat factory of Gyula is near bankruptcy. There is a meat market in Nádudvar.” V7 farmer

„The purchasers were napmen, they pushed down the prices. Meat comes from Debrecen and abroad to Gyula. We are risking our own property so we must work 365 days a year.” V8 farmer

„The processing industry has been destroyed.” V8 farmer

„I feel sorry that the well structured and modern waste water treatment plant can only work on 60-70 % of its total capacity because with the decline of the processing industry the full capacity can not be utilized.” V5 non-farmer

„Today everything is transported away, processed and then transported back, nothing is done in the same place (for example the place of slaughter, processing and sales of livestock), this is not profitable.” V8 farmer

„The dairy has closed in 2004, the production has dropped in the meat factory.” V4 non-farmer

„I find the reduction of animal husbandry a big mistake, a sin even. The meat factory employs a very few people already, its buildings have either been demolished or they are empty. This has contributed to the growth of unemployment and with the weakening of purchasing pork has also become hard to sell.” V5 non-farmer

„The local meat factory provides about 300 jobs. Since the prohibition of pig slaughter there is less and less people who can make a living of the meat industry.” V10 local politician

„I can sell the milk with a lot of difficulties only, because the largest dried milk factory, the dairy in Gyula has also been closed.” V16 farmer

„Among other things there used to be a stocking factory, iron industry, hydraulic industry, a milk powder factory, an agricultural machine factory, a furniture factory and the famous Gyulai meat factory. These factories, without exception, have become bankrupt or were destroyed. The famous Gyulai meat factory today works with poor materials, with the use of 60% fat and 40% cutting they produce low quality products that bring shame on tradition working on a significantly smaller area.” V16 farmer

An opposing opinion also appears about local processing industry. Not all subjects had a negative opinion there are processes heading the opposite direction as well, not only deterioration. This positive opinion was only shared by one farmer and the two leaders of the city:

„The meat factory in Gyula only employs 390 people but it is still important.” V11 local politician

„On the other hand, butchers working in family enterprises cooperate and produce high quality products not competitive in quantities but in quality with the meat factory. [...] There is also a textile painting plant in Gyula that is unique in Hungary because all the others were displaced by Chinese products.” V10 local politician

„Our butcher’s market and economy go hand in hand.” V7 farmer

Besides the crisis of agriculture and the processing industry several people complained about the resulting unemployment and migration of youth:

„There are few jobs and a lot of unemployed people” V4 non-farmer

„There is a lot of migration among local youth, perhaps it is a bit better on the Romanian side.” V10 local politician

„People’s ability to sustain themselves has decreased (perhaps due to urbanization), they don’t know their rights, there is a lot of idle people” V11 local politician

„There is a huge unemployment around the city of Gyula.” V14 farmer

Different attitude of farmers and people living in the city

We observed that if the subjects were farmers they reflected on different problems and they reacted with different emotions on a given subject than people not working in agriculture. One of the differences appeared already in the matter of tourism: farmers think that the city puts too much emphasis on it which hinders agriculture, while people living in the city praise the excellent touristic possibilities of the town.

Subjects not working in agriculture talked about the spirit of the town while farmers haven’t mentioned it:

„There is a lot of green areas which makes the city a nice place.” V4 non-farmer

„People of Gyula like their city and they are very hospitable” V5 non-farmer

„Related to city environment: pedestrian streets has been constructed which is good for tourism but bad for transport.” V10 local politician

„Gyula is a nice place, a consolidated small town and it’s silent. It’s a city of gardens and bath.” V3 national park service ranger

Farmers working in nature daily rather mentioned love of nature instead of the spirit of the town, talking about the importance of their connection with nature. They regret it doesn’t have a value anymore. These feelings were not mentioned by the subjects working in other areas, outside agriculture:

„I’m sorry that my son will not continue farming..” V1 farmer

„Such a land is the Péli pasture, it’s a place I love.” V1 farmer

„I love nature, I have been connected to it since my early childhood, this is my job, I know a lot of things about nature.” V2 farmer

„In the past people used to navigate with the help of natural objects such as hills, today they don’t pay attention anymore, they’ve got the GPS.” V2 farmer

„I hike a lot while I’m checking the lands and I love doing it” V9 farmer

Subjects living in a closer relationship with nature – the farmers and the national park service leader – were able to give a description of the surrounding landscape while the rest of the subjects with different occupations couldn’t:

„Several branches of the late Fehér-Körös used to flow through Gyula. Today there is one regulated river bed that is called living water channel. North to it there are large flood plain forests, while on the south there is a patchy agricultural area where the lower, alkaline lands are not cultivated, those are grasslands. There aren’t many protected plants here, but a few characteristic species like hog’s

fennel or *Plantago schwarzenbergiana*. In the forests by the river Fekete-Körös alpine plants can be found, too.” V3 national park service ranger

„Six years ago there was a larger fire on the grassland. They were fighting the fire for a week.” V6 sheep farmer

„There are alkaline lands in the area. The Körös rivers cause no trouble.” V7 farmer

„Today there are no more farm houses only next to the road directly, old farm houses have disappeared 20 years ago, they have been ‘cleaned up’. Today it’s only those who have nowhere else to go who still live there or those who still have the possibility to do farming.” V8 farmer

„The landscape hasn’t changed a lot, there is a sand mine in the area.” V9 farmer

„During the past few years several sand mines were constructed in the area that have been abandoned later and transformed into fish-ponds thus placing artificial objects into the natural landscape.” V14 farmer

„Sand mines were constructed in the area and later they were abandoned. After that the pits have been transformed into fishing ponds.” V16 farmer

Locals’ view of nature conservation

Our research has revealed a conflict that was a characteristic in the Magyarcsanak site also: the discrepancy between the farmers and the nature conservationists. The most problems mentioned by farmers have reference to Natura 2000 area which is not controlled by the national park but by the Agriculture and Rural Development Office. Farmers typically had a negative opinion about the work of the nature conservationists or at least about the regulations, that farmers often found useless or even harmful for agriculture. However the majority of farmers realize that nature conservation is important yet they are hostile towards the work of the nature conservationists:

„It would be good if people had time, besides working day and night, to care about the environment.” V14 farmer

„I find nature conservation important, to do farming in a way that respects nature.” V1 farmer

„It’s important to protect nature.” V2 farmer

„Nature protection is important. Especially because I make a living with it.” V9 farmer

„Grazing is prohibited on the side of the dike. In the past sheep used to step on it which compacted the soil preventing leakage.” V1 farmer

„I wanted to change the landscape. I wanted to transform 40 hectares of ploughland into a forest, but the land has become a Natura 2000 area and planting forests is not allowed anymore. I can go on with farming but I’m not allowed to plant a forest.” V6 sheep farmer

„Years ago farmers were told that the grasslands, about 100hectares were going to become a Natura 2000 area. Everybody was against it but from 2 years ago it has become official. We try to respect it ever since even though we suffer an obvious loss: because of the regulation of the times of mowing we can only mow a worse quality hay so we need to rent different, not protected lands for hay.” V16 farmer

„Compared to how it was in the past it is good that the grasslands are protected. Before the Natura 2000 it wasn't valued this much, they used to trample on it a lot due to agricultural work.” V16 farmer

„I don't agree with the rules layed down by the National Park. There used to be an order in this neighbourhood, now we can't even cut the grass next to the road. I find the work of the National Park unnecessary. The animals and plants that are here used to live here in the past too. Nobody was here to protect them, but they still survived.” V7 farmer

„We don't know the purpose of the National Park's activities. We find the whole work unnecessary.” V7 farmer

„We should find the golden mean between environmental protection and profitable farming.” V9 farmer

„I object to the land becoming a Natura 2000 area. Conservationists come up with very strict regulations and limitations.” V12 non-farmer

On the other hand, the local ranger complained that people don't understand nature conservation and the work of the national park:

„People don't understand nature conservation, they don't understand what we do. When we planted trees at the borders of the protected area they went through them with a disc. They don't understand the treatments we do either, for example when the weeds were growing around the trees so that the game don't destroy the seedlings which is also a forestry practice, people saw this as 'they struggled with the trees for a while but in the end they just left the whole thing'. Although, about grazing it was possible to gradually make them realize that extensive grazing is a better method.”

„If the process that we have started in the protected area would continue, a forest steppe could form, but this requires that the land stays in state ownership controlled by the national park, it should be the national park that decides what happens on these lands, but the political situation is not very promising today.”

„The ESA (Environmentally Sensitive Areas) program and the target programs work very well (for instance in Kardoskút and Dévaványa), that's what would be needed here too.”

„Since the times of the cooperative people have forgotten what was before intensive agriculture, the attitude has changed, farmers could only be convinced if they were paid enough money.” V3 national park service ranger

There was a difference between people living in the city and farmers in their attitude towards conservation. While farmers expressed a hostile opinion related

to the nature conservationists, those who didn't work in farming had a positive opinion about the attitude of the city in the protection of the natural environment, but the two local politicians haven't mentioned the protection of nature or the environment in the city:

„Selective waste management has been a practice for quite a long time in Gyula. A contractor does the selecting and baling of paper waste. Green waste is collected separately: each home with a garden has a separate bin for organic waste for the compost. The compost plant also works in the waste water treatment facility.” V5 non-farmer

„The city of Gyula cares a lot about nature conservation.” V5 non-farmer

„Natural environment has changed in a good direction, people have realized that it's for their own good to protect the environment. It can be noticed around the city, the town is cleaner and cleaner.” V5 non-farmer

„The situation is going to improve, people and experts care more and more about the environment, less malpractice occur. For example there was a lot of damage done to nature in case of Nagymaros – they pay much more attention to avoid such errors. When trees are cut, they are replanted in time.” V4 non-farmer

Conclusion

Although we tried to concentrate on the area described in the 2nd chapter, but the people, we have asked, especially in the town Gyula, sometimes spoke about the wider surrounding, including the forests to the North of the town, or about the national park area named Szabadkígyósi puszta to the West of the described area.

We can conclude from the interviews carried out in Gyula that the most important ecological services perceived by locals are mainly provisioning services: crop production and animal husbandry, though the latter one is supplanted. Besides crop production fodder production was not mentioned on its own, but it rather appeared when the subjects talked about the grazing possibilities of grasslands. Many farmers have complained about inappropriate regulations making it unprofitable to make use of this ecosystem service. A few subjects mentioned other provisioning services too: biogas, local forests, medicinal water and biodiversity.

Among regulating services only the air filtering capacity of forests has been mentioned and just in one interview. This lets us conclude that people living in Gyula don't perceive the surrounding nature as a regulating, cleaning and protecting system.

Among the cultural services our subjects talked about the turmoil around the city that they found important and valuable. Tourism has a high significance as well, the thermal spa was also mentioned. Although the opinions differed about tourism: farmers found that this service is over-valued and it inhibits agriculture,

while people working in other sectors have praised the city's attitude towards tourism considering it an important source of income.

Instead of supporting services they referred to nature as a source of risk and danger, a lot of farmers complained about the problems related to unsettled weather and excess surface water.

A phenomenon was obtrusive during the interviews: farmers and non-farmers otherwise reflected on the same questions, seen some of the problems from different perspective, as outlined in the context of the tourism. This is somewhat understandable as a natural phenomenon that a man's world view is influenced by his profession. Besides our sampling was not large enough that we could conclude far-reaching conclusions from these results about attitudes of farmers and non-farmers.

Besides the inventory of ecosystem services our research has revealed further local problems, conflicts. For example the declining of processing industries in Gyula, the unemployment and youth migration. An other conflict was the farmers hostility against the regulation of Natura 2000 areas, and the national park ranger's complaints about farmers.

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