PROLINE-CE

WORKPACKAGE T2, ACTIVITY T2.2

IMPLEMENTATION OF BEST PRACTICES FOR WATER PROTECTION IN PILOT ACTIONS

D.T2.2.2 PARTNER-SPECIFIC PILOT ACTION DOCUMENTATIONS

PILOT ACTION: PA3.2 Along Danube bend

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1. Introduction

Best management practices (hereinafter BMPs) for drinking water protection and management derived from T1 were reviewed and relevant BMPs were selected for particular pilot action. Implementation status of BMPs was verified in Pilot Actions (T2); in case of lacks identified, possibilities of improvement and implementation were also assessed. Drinking water protection and management and best practices are strategically implemented in the pilot actions, in order to achieve a function-oriented land-use based spatial management for water protection at the operational level. Measures and actions were analysed and proposed concerning mitigation of extremes and achieving a sustainable drinking water level. PROLINE-CE pilot actions reflect the broad range of possible conflicts regarding drinking water protection, such as: forest ecosystem service function; land-use planning conflicts; flooding issues; impact of climate change and land-use changes; demonstration of effectiveness of measures including ecosystem services and economic efficiency.

Review of main land use conflicts and BMPs on Pilot Action level has already been done in Pilot Action BMPs reports, which were a basis for *D.T2.1.2 Transnational case review of best management practices in pilot actions*. Description of natural characteristics of Pilot Site is presented in *D.T.1.4 Descriptive documentation of pilot actions and related issues*.

Activities within Pilot Action were done according to set-up which was described in *D.T2.1.5 Set-up report about adaptation of the transnational concept to pilot action level*.

The Deliverable *D.T2.2.2 Partner-specific pilot action documentations* presents final Pilot Action report regarding the management actions examined in the Pilot Action, description of conducted activities and identified solutions for case-specific adaptations of management concepts. This report presents final work report regarding the implementation of best management practices for drinking water protection in pilot action PA3.2 Along Danube bend.

2. Testing of BMPs in Pilot Action

2.1. Objective(s) of Pilot Action

The aim of testing the identified BMPs in Pilot Action 3.2 Along Danube bend is to provide a better interaction between drinking water supply systems and land use in the pilot area.

The main source of drinking water on the pilot area is bank-filtered water. Since the extraction wells are situated along the Danube and near to agricultural and/or urban areas, they are particularly vulnerable to contamination induced by flood, agricultural production and sewage infiltration.

In the drinking water protection areas, the sewerage system of settlements is typically solved. In non-channelled settlements, the collection and transport of sewage in closed containers is a requirement, but the control of it is not solved. In the case of outdoor site constructions, the use of a single sewage treatment plant could be acceptable in the water protection area.

In the case of arable land cultivation in outer territories, enforcing the compliance with water protection methods is the most difficult. This is due to the difficulty of control. It is practically impossible to check what kind of activities the owner is carrying out, how and what nutrients or pesticides apply. Subsequent sampling and testing are possible, which is also cumbersome and costly. A practical solution is voluntary compliance, the importance of it farmers must be defeated. It is not an easy task. In the case, the farmer ecological farming or enters the agro-environment system, the water protection rules will be implemented more or less. In the framework of these systems, control is also solved. Cooperation between water and agriculture is required.

In the case of forest cultivation, clear-cutting may cause contaminant loads. This may be significant in karst areas. In the karst area, the unfavourable effects of land use interventions can appear directly in the drinking water. As a result of the clear-cutting, the soil may sink into the aquifer causing deterioration of quality. Designating sensitive areas and managing trees as a defence forests can be a solution. This, however, affects the forest manager financially. Cooperation between the waterworks and the forestry industry is required. It is a favourable situation if the area is protected from nature conservation.

We identified three main problems (GAPs) on the pilot area related to the above mentioned, which we describe in detail in Chapter 2.2.

2.2. BMPs of Pilot Action

▪ Identified GAP provoking action			
GAP short name	**Agricultural groundwater pollution**		
GAP short description	Nutrients used in agricultural production infiltrate into the soil causing groundwater contamination		
▪ **Best management Practice / Management Action**			
Name of BMP	**Participation in Agro Environment Program**		
Type of land use regarded	Agriculture		
Location	Bank filtered water resources systems at Vác, Leányfalu, and on Szentendre Island		
BMP description	Water quality of bank filtered water resources can be significantly affected by agricultural production and water dissipation techniques for wastewater treatment in settlements. On Szentendre Island, arable crop production is significant, intensive, irrigated strawberry farming is conducted in relatively large areas. The island became a sensitive nature area in 1999 under the National Agro Environmental Program. Since 1999 an environmental friendly.		
Advantages of this BMP in PA	The environmentally friendly cultivation methods of the National Agro Environment Program (NAP) are fully in line with water protection requirements. If on the hydrographic protection areas of "A" and "B" water resources farmers connect with NAPs with a significant area of land, the groundwater load can be reduced from the top soil layer to the groundwater.		
Challenges of this BMP in PA	Convincing the widest possible range of farmers to participate in the Program. The Water Resources Protection Law contains rules and restrictions on agricultural production in "A" and "B" hydrological protection areas of water resources. However, controlling every activity on those areas is very difficult due to the lack of monitoring. The NAP's professional architecture and rules form a unified system, with which better results can be achieved, the environmentally-friendly effect is more significant. The program control system has been built.		
Relevance	Water protection functionality	high	
	Cost of the measure	medium	
	Duration of implementation	medium-term	
	Time interval of sustainability	medium-term	
Limitations	The Water Resources Protection Laws contains rules and restrictions on agricultural production on "A" and "B" hydrological protection areas of water resources.		

Comments	
References / sources	

Identified GAP provoking action		
GAP short name	**Lack of sanitary coverage**	
GAP short description	In water resources protection areas, the wastewater disposal was unresolved for a long time. After the drainage and sewage treatment, the quality of the ground water changes slowly.	
Best management Practice / Management Action		
Name of BMP	**Municipal sewage disinfection**	
Type of land use regarded	urban land	
Location	Bank filtered water resources systems at Dunakeszi, Vác, Leányfalu, and on Szentendre Island	
BMP description	Quality of bank-filtered water can be significantly affected by background impacts. Major background impacts are coming from sewage handling practices and agricultural production. As a result of decades of sewage infiltration on urban land areas, high concentration of nitrate (100-200 mg / l) is present in the groundwater below and around these areas. In the non-drained areas, the preparation and use of sealed wastewater was obligatory in the water protection zone. Keeping under control the transportation or infiltration of the sewage from storage vessels is difficult and still unresolved. From the evolution of groundwater quality and other information it appeared that in most cases sewage infiltration occurs. The construction of sewage systems in urban areas has resulted in solutions. Sewerage services has been progressively implemented, households have gradually joined the network. If a house is being built on the external "A" and "B" hydrological protection areas for water resources where a sewerage network is available, it is mandatory to connect to the network. Thus, groundwater is getting less and less stressed, but the nitrate content that has been already added is only slowly being eliminated. This process has been going on for several decades in some locations. At the test sites it is monitored how nitrate content in groundwater varies over time.	
Advantages of this BMP in PA	sewage infiltration decreases	
Challenges of this BMP in PA	It is difficult to separate the effects of urban land sewage infiltration from other activities which can cause nitrate pollution.	
Relevance	Water protection functionality	high
	Cost of the measure	high

	Duration of implementation	long-term
	Time interval of sustainability	long-term
Limitations	Legislation on water resources stipulates that in the internal protection area of water resources only water supply facilities can be located. No residential or recreational park can be built on the external and "A" hydrological protection zone. Building of new residential or office buildings without drainage system on the external or "A" hydrological protection zone is prohibited.	
Comments		
References / sources		

Identified GAP provoking action		
GAP short name	**Flood protection protocol on bank-filtered wells operations during high water and flood events**	
GAP short description	When flood occurs, the river may flood the well structures, or surface water can enter the wells.	
Best management Practice / Management Action		
Name of BMP	**Ensure the drinking water supply during high water or flood.**	
Type of land use regarded	Forest, agricultural land site, urban land	
Location	Budapest Waterworks, Szentendre Island bank-filtered system	
BMP description	The Budapest Waterworks Szentendre Island bank-filtered wells are gradually being built, some of them is beyond the age of 100, so their structure is different. The old wells have been renovated several times, equipped with modern technical equipment, facilities, remote control. The well structures are above the standard flood level at the time of their construction. The Budapest Waterworks is prepared for operation during flood events with flood management orders.	
Advantages of this BMP in PA	The Budapest Waterworks has set up a flood operating order based on its great deal of practice and experience in operating during flood events.	
Challenges of this BMP in PA	Ensure water supply during protracted high water and flood events.	
Relevance	Water protection functionality	high
	Cost of the measure	high
	Duration of implementation	long-term
	Time interval of sustainability	long-term

Limitations	
Comments	
References / sources	

3. Activities in the Pilot Action

Examination of the extension of the Agro Environmental Program in the last almost 20 years and its impact is a must. This can be done by monitoring the quality of groundwater in the selected water resources and compare it with the number of participants joining the program. We examine the effect of the spread of environmentally friendly agricultural production in the change of groundwater quality. Long-term data series are essential for this study given that the quality change of groundwater is a very slow process, the dilution, depletion, and possible degradation of downstream nitrate content takes place over a long period of time. This task can be done partially since we do not have the appropriate data on how many farmers has joined the National Agro Environmental Program.

We investigate how the connection to the sewage network developed and if its impact on water resources can be identified. This can be done because the quality of groundwater in the selected water resources has been monitored for decades. Long-time data series are essential for this investigation, because the change in the quality of groundwater is a very slow process, the dilution, the depletion, the possible degradation of the enriched nitrate content takes place over a long period of time.

Water chemistry data and sanitary network data was provided by the regional water utility supplier, *Budapest Waterworks* with the contribution of *National Water Directorate (OVF).*

Table 1: Stakeholder involvement for PA3.2.

<table>
<tr><td colspan="3">Stakeholder involvement</td></tr>
<tr><td colspan="3">We examined the water chemistry changes since 1995 using monitoring well data</td></tr>
<tr><td colspan="3">Testing of BMPs (evaluating well monitoring reports, sanitary coverage, water stage level reports, and the number of participants joined National Agro-Environment Program - NAEP)</td></tr>
<tr><td>(3/a) We investigated how many participants has joined NAEP on Szentendre Island where agriculture is more likely a pollution source</td><td>(3/b) We investigated the extent of households connections to the inland sewage network and compared it with water chemistry data</td><td>(3/c) We examined how nitrate concentration changes during and after flood events</td></tr>
</table>

3.1. Water chemistry

3.1.1. Water chemistry changes on Szentendre Island since 1995 (MONITORING WELLS)

In context of the earlier identified GAPs, namely the *agricultural groundwater pollution*, the *lack of sanitary coverage*, and *the flood protection protocol on bank-filtered wells operations during high water and flood events*, first we had to examine changes in water chemistry. The most complex area within the PA is Szentendre Island – agricultural production, recreational areas with no sewerage system connection, and high flood risk vulnerability, therefore we have chosen monitoring wells located on the island to examine water chemistry changes. Criteria in this examination was duration of data series, which should start in 1995. Thus, we used data measured in 50 wells in total. We focused on the following parameters:

- GAP1: ammonium, nitrate, nitrite, pesticides
- GAP2: ammonium, nitrate, nitrite, sulphate
- GAP3: ammonium, nitrate, nitrite, pesticides, sulphate

Actual limit values in Hungary for groundwater are in Table 2.

Table 2: limit values in Hungary for groundwater.

NH_4	NO_3	NO_2	SO_4	pesticides
0,5 mg/l	50 mg/l	0,5 mg/l	250 mg/l	500 ng/l

On *Fig 1* one can see the location of the wells situated on the Szentendre Island. The wells where data showed deterioration or values are still above limit are marked.

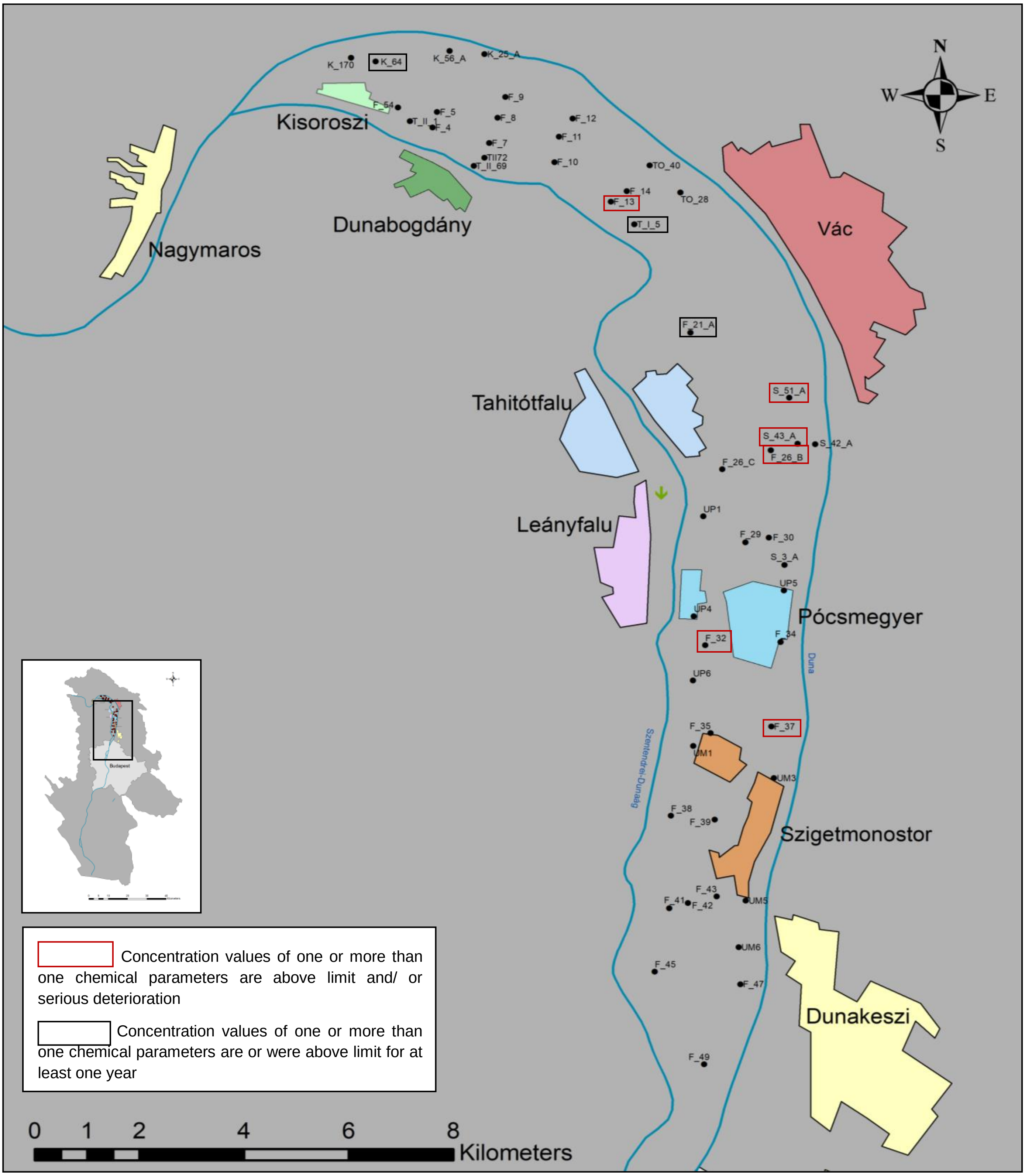

Figure 1: Wells on Szentendre Island which have water chemistry data series from 1995.

Out of the 50 wells examined for water chemistry in 9 we found values above limit for a longer period of time (>1 year).

Table 1 shows average values of the examined chemical parameters for each 9 wells. The averages are calculated for the 1995-2016 period, except for pesticides, due to its monitoring started only in 2012 on Szentendre Island.

Table 3: Averages for examined chemical parameters for the 1995-2016 period. Pesticide monitoring started in 2012. Red highlighting marks values above limit, arrows show the overall trends in water quality changes (deterioration = ↓, improvement = ↑, no trend (not significant changes) = *Ø*).

	F_13	F_26_B	F_32	F_37	S_43_A	S_51_A	F_21_A		K_64	T_I_5
NH_4 [mg/l]	*1,20 ↑*	*0,02 ↓*	*0,01 ↓*	*2,27 ↑*	*0,02 ↓*	*0,02 ↓*	*0,03 ↓*		*0,42 ↑*	*0,44 ↑*
NO_3 [mg/l]	*0,8 ↑*	*88,9 ↓*	*59,1 ↓*	*1,9 ↑*	*74,9 ↓*	*51,0 ↓*	*42,8 ↓*		*6,5 ↑*	*0,5 ↓*
NO_2 [mg/l]	*0,037 ↑*	*0,01 ↓*	*0,003 ↓*	*0,017 ↑*	*0,011 Ø*	*0,005 ↓*	*0,004 ↓*		*0,046 ↑*	*0,012 ↓*
SO_4 [mg/l]	*145,7 ↑*	*152,2 ↓*	*107,6 ↓*	*46,9 ↓*	*125,4 Ø*	*114,2 ↓*	*146,4 ↓*		*53,0 ↑*	*96,6 ↑*
pesticides [ng/l]	n/a	**2016.** *135,4*	**2016.** *122*	n/a	n/a	**2016.** *345*	n/a		**2012.** *244* **2013.** *101* **2014.** *40,1* **2015.** *27,5* **2016.** *22,8*	**2012.** *244* **2013-2016.** *>10*

We also investigated changes in nitrate concentrations on the left and right bank of Danube around Szentendre Island. This is a less vulnerable area to flood or agricultural activities, but sanitary coverage and sewage handling could be a pollution source for groundwater.

3.1.2. Water chemistry changes on Szentendre Island since 1995 (DRINKING WATER PRODUCTION WELLS)

We examined 121 drinking water production wells located on Szentendre Island.

The quality of bank filtered water is defined by the quality of surface water, the quality of groundwater, and the bank filtration processes. The bank filtered water sources are vulnerable to contaminants coming from the surface water as well as coming from groundwater. Deterioration of the quality of bank filtered water can happen due to contamination of the surface water, anaerobic digestion, and excessive dredging.

We assessed data from 121 drinking water production wells to see changes in the presence and concentration of five chemical parameters (ammonium, nitrite, nitrate, sulphate and pesticides) between 1996 and 2016.

Nitrate

In case of bank filtered wells, it needs to be considered that nitrate concentrations can significantly fluctuate according to whether the water comes from the river or the aquifer, and also, if nutrient leaching happened due to heavy rainfall (as an example see *Fig 2*).

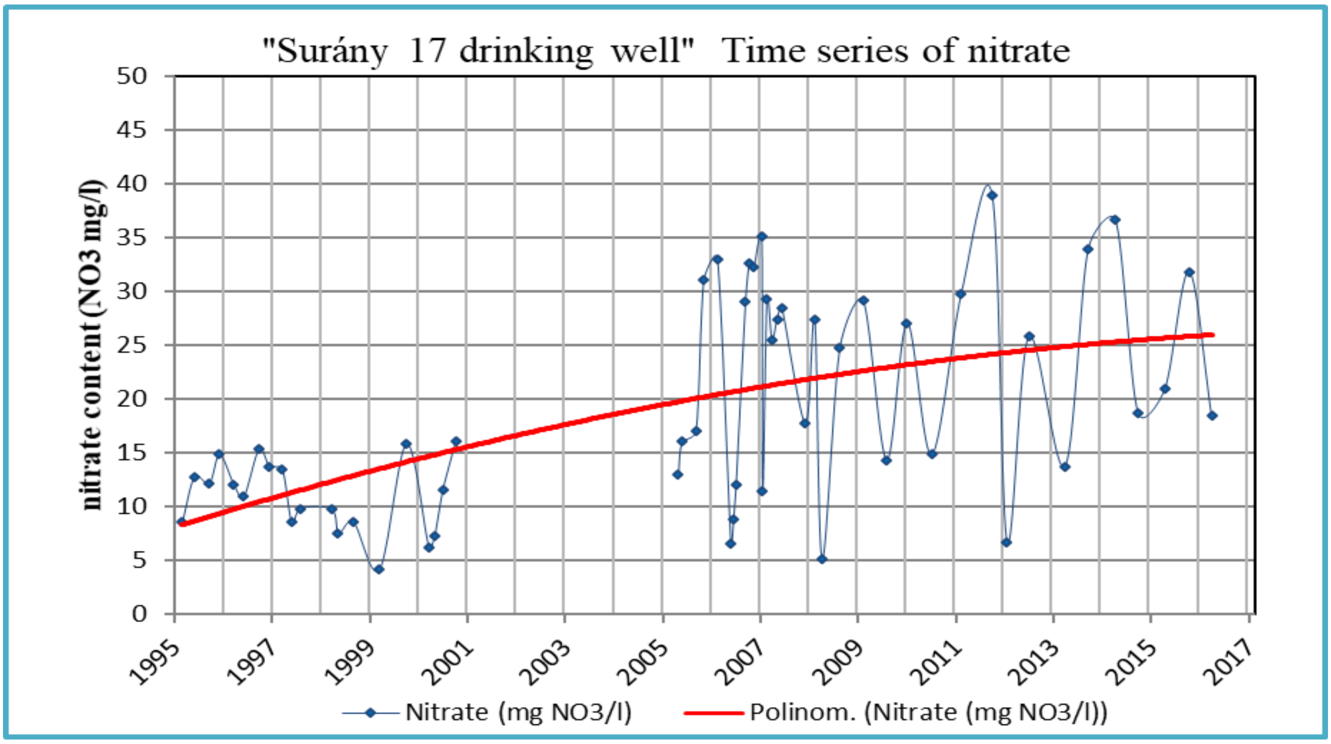

Figure 2: Time series of nitrate concentration changes in *Surány 17* drinking water production well.

88,4% of the maximum nitrate concentration values were between 5-25 mg/l, 8,3% were between 25-50 mg/l, and only in one well (Surány 13. horizontal well) got the concentration over 50 mg/l in 2006 (see *Fig 3*).

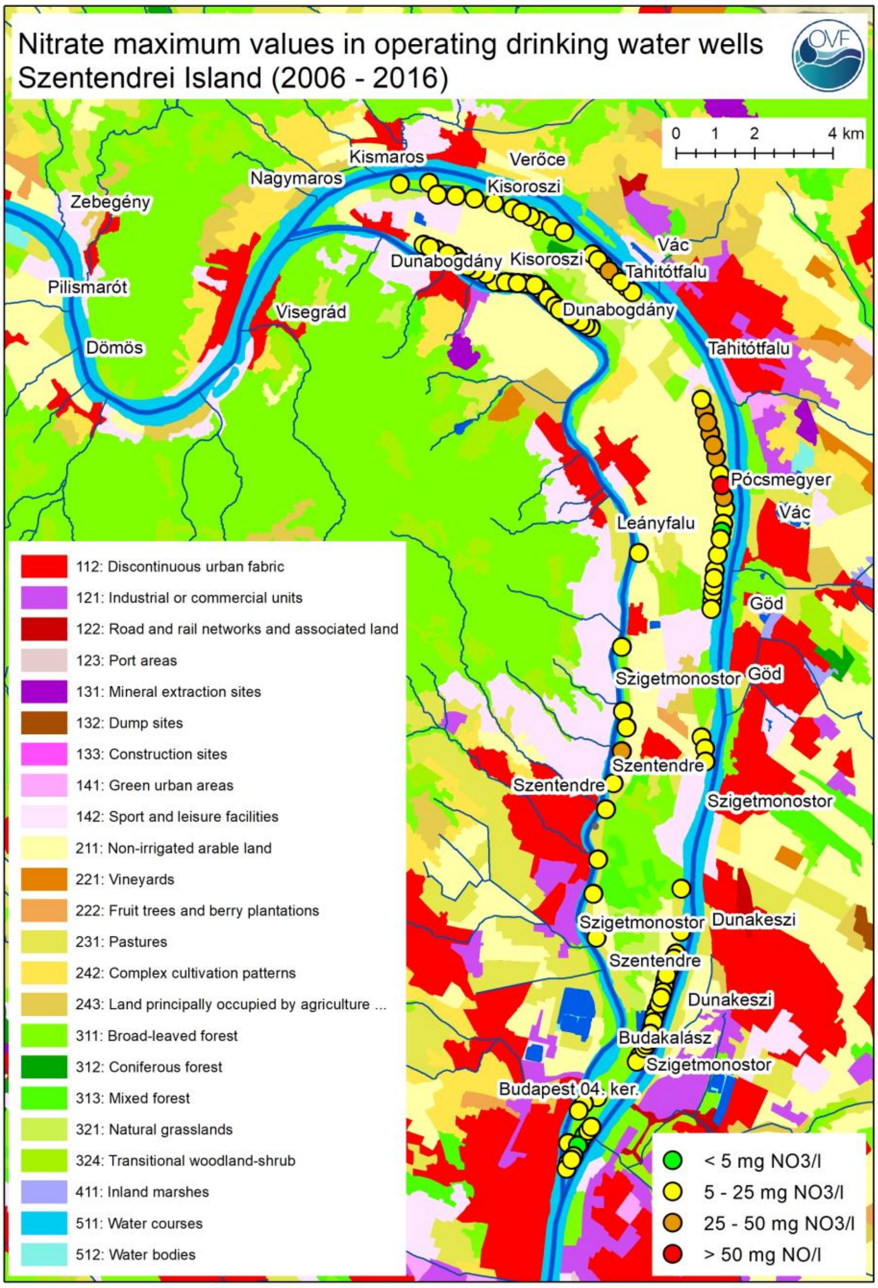

Figure 3: Maximum nitrate concentration values in operating drinking water production wells on Szentendre Island (2006-20016).

According to examined nitrate concentration trends we compared for two periods (1996-2005 as the reference period, and 2006-2016) and we categorized the trends in five categories. As it is written in *Table 2* 72 wells out of the 121 showed decreasing trend, out of that 17 were significant; 13 wells showed significant increase, 17 showed slight increase.

Table 4: Changes in the maximum nitrate concentrations.

Rate of change	Description	Well (pcs)	Well (%)
>+5 mg NO3/l	significantly increasing trend	13	10,8
(+1)-(+5) mg NO3/l	slightly increasing trend	17	14
(-1)-(+1) mg NO3/l	equilibrium	19	15,7
(-1)-(-5) mg NO3/l	slightly decreasing trend	55	45,5
<+5 mg NO3/l	significantly decreasing trend	17	14
Total		121	100

The changes in the maximum nitrate concentrations are also shown on *Fig 4*.

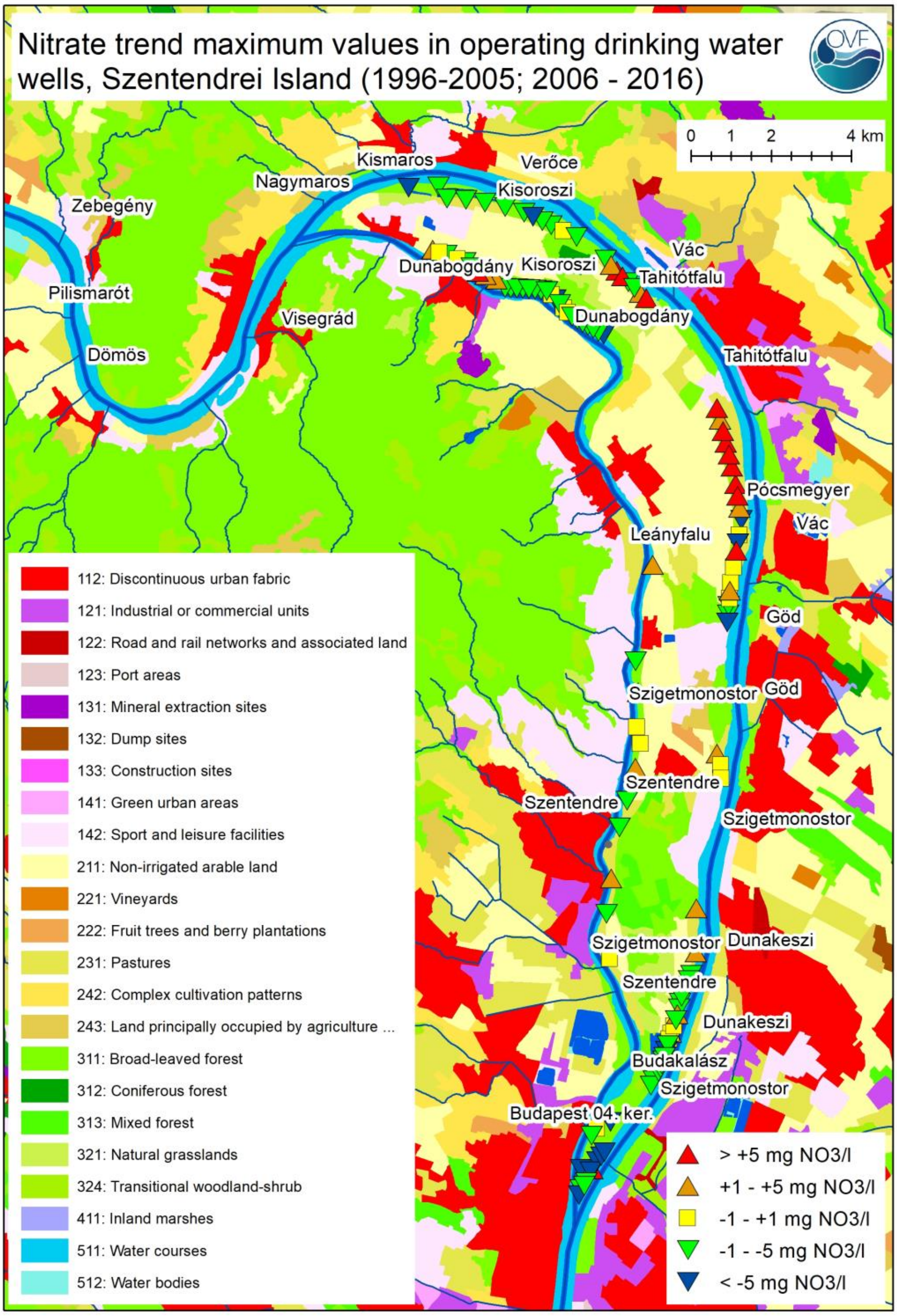

Figure 4: Identified trends in maximum nitrate concentration changes.

Ammonium, nitrite, sulphate

During the examined period between 1996 and 2016, the concentrations of ammonium, nitrite and sulphate show the characteristic values of the bank filtered drinking water sources, no significant changes can be detected.

Pesticides

A total of 96 pesticide components were tested in the drinking water production wells of Szentendre Island, during the 1996-2016 period. The following components caused mild problems: DDD-DDE-DDT total, atrazine, simazine, terbutryn, metribuzin, desethyl atrazine, diazinon, 2.4-D, 2.4.5-T, MCPA and acetochlor. In Surány 13. horizontal well in 2006 atrazine exceeded the 0,1 µg/l limit value. (In 2010 and 2016 triazines can be only slightly detected in the same well.)

The pesticide monitoring is much more sophisticated since 2010 than before, therefore we evaluated the 2010-2016 period.

Atrazine herbicide was monitored in 92 wells on Szentendre Island between 2010 and 2016. *Table 3* shows the maximum concentrations of atrazine in 5 categories (see also *Fig 5*).

Table 5: Maximum concentrations of atrazine between 2010 and 2016.

Concentration range	Well (pcs)	*Well (%)*
<0,001 µg/l (non-detectable)	34	*37*
0,001µg/l - 0,01 µg/l	52	*56,5*
0,01µg/l - 0,05 µg/l	6	*6,5*
0,05 µg/l - 0,1 µg/l	0	*0*
>0,1 µg/l	0	*0*
Total	92	*100*

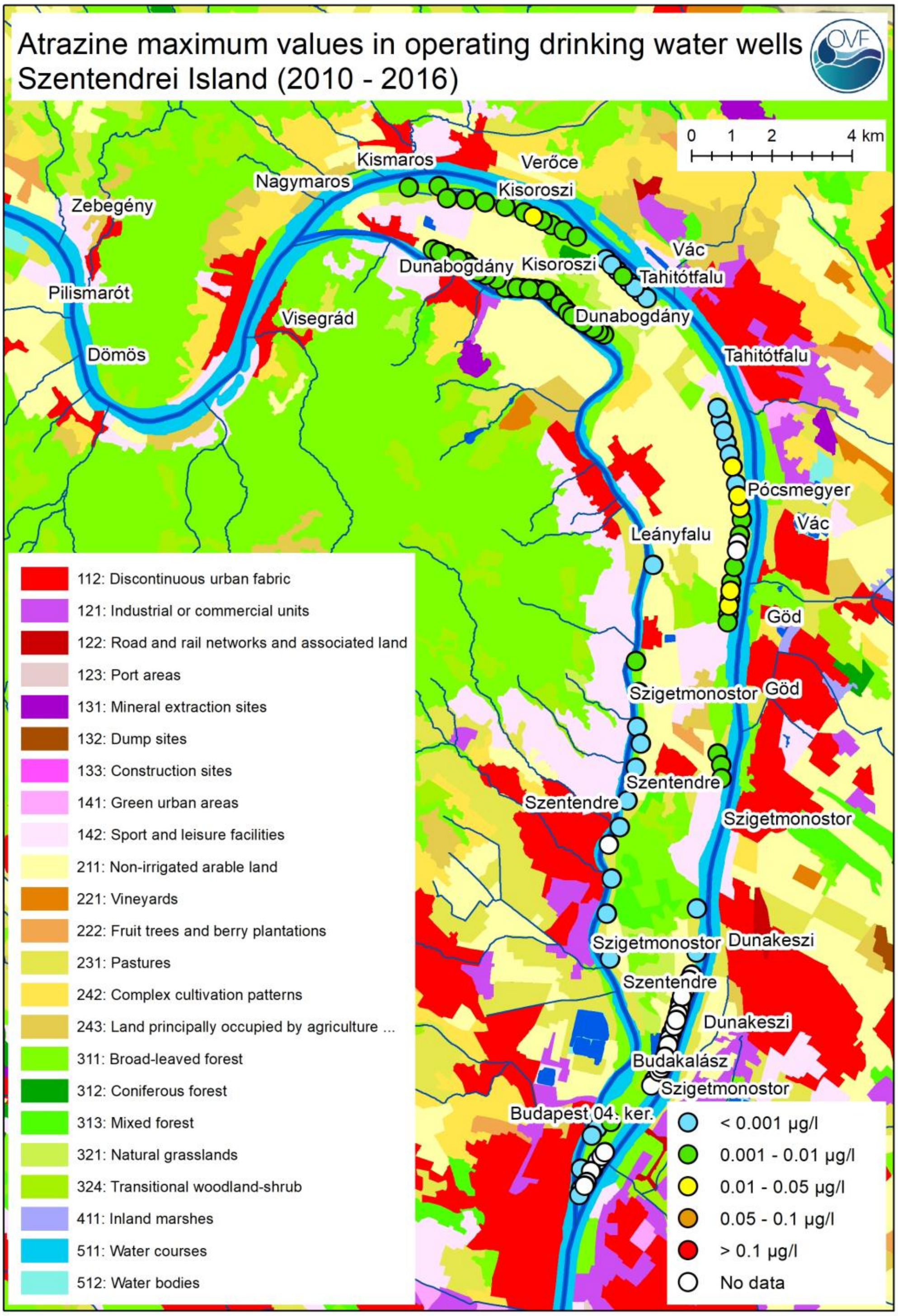

Figure 5: Maximum atrazine concentrations in drinking water production wells between 2010 and 2016.

3.1.3. Nitrate concentration changes since 1995 on left and right bank of Danube around Szentendre Island

We collected data from observation wells working since the mid ‘90s in Dunakeszi, Dunabogdány, Tahi-Leányfalu and Vác-Buki Island. We focused on nitrate concentration, as a general indicator for contamination, in the perspective of agricultural production (Dunabogdány, Tahi-Leányfalu and Vác_Buki Island are relevant), and in the perspective of sewage related pollution (Dunakeszi, Dunabogdány, Tahi-Leányfalu and Vác-Buki Island are relevant). Tendencies are shown on *Fig 6*. Limit value for nitrate in groundwater is 50 mg/L.

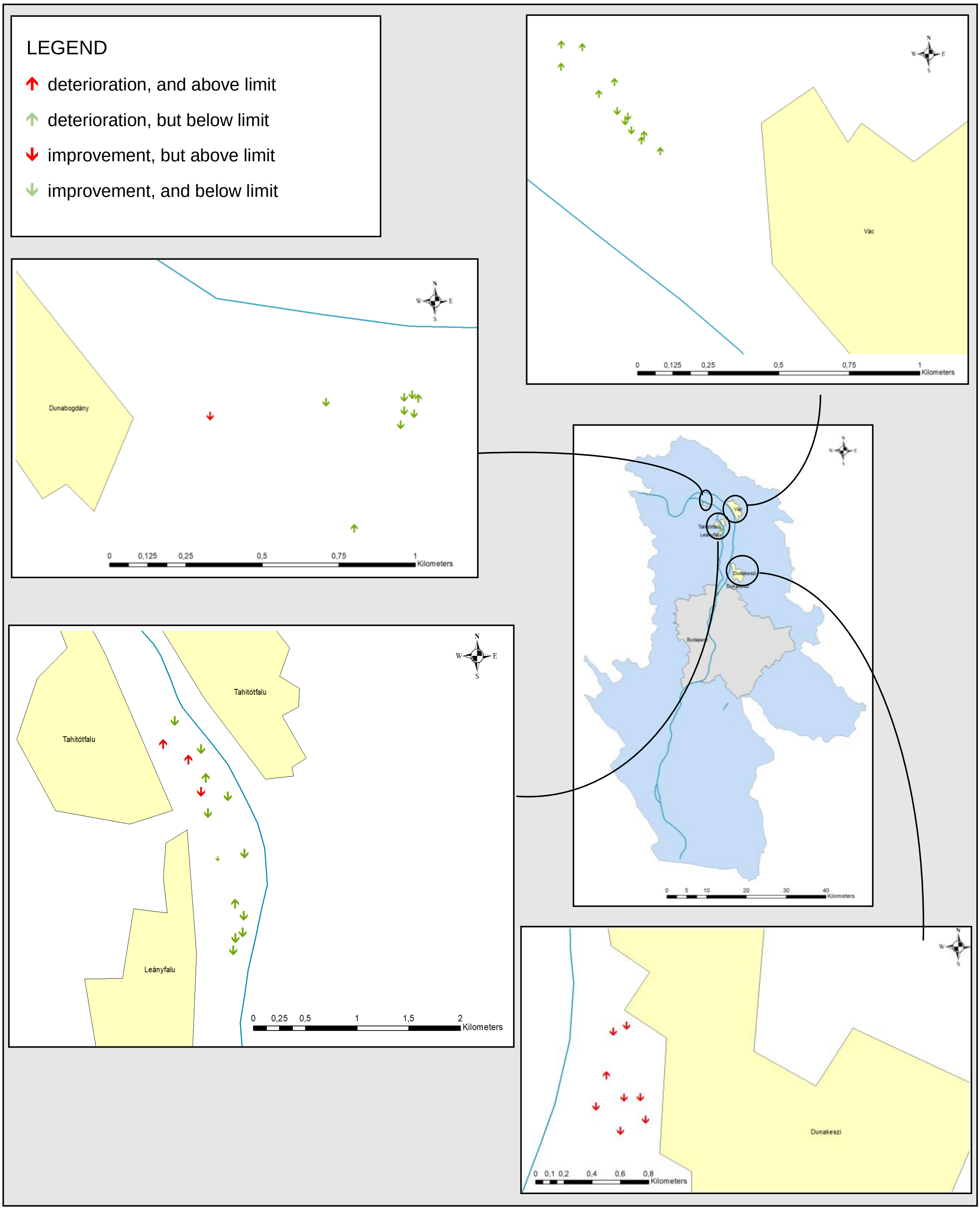

Figure 1: Changes in nitrate concentration in observation wells.

3.2. Testing of BMPs

3.2.1. Participation in Agro Environment Program

Deteriorating water quality conditions were observed in wells located on non-irrigated arable land (*Fig 7*). On this area strawberry production is the main activity. Further investigation is needed to compare trends in water chemistry change with the number of participants who joined Agro Environmental Program since late ‘90s.

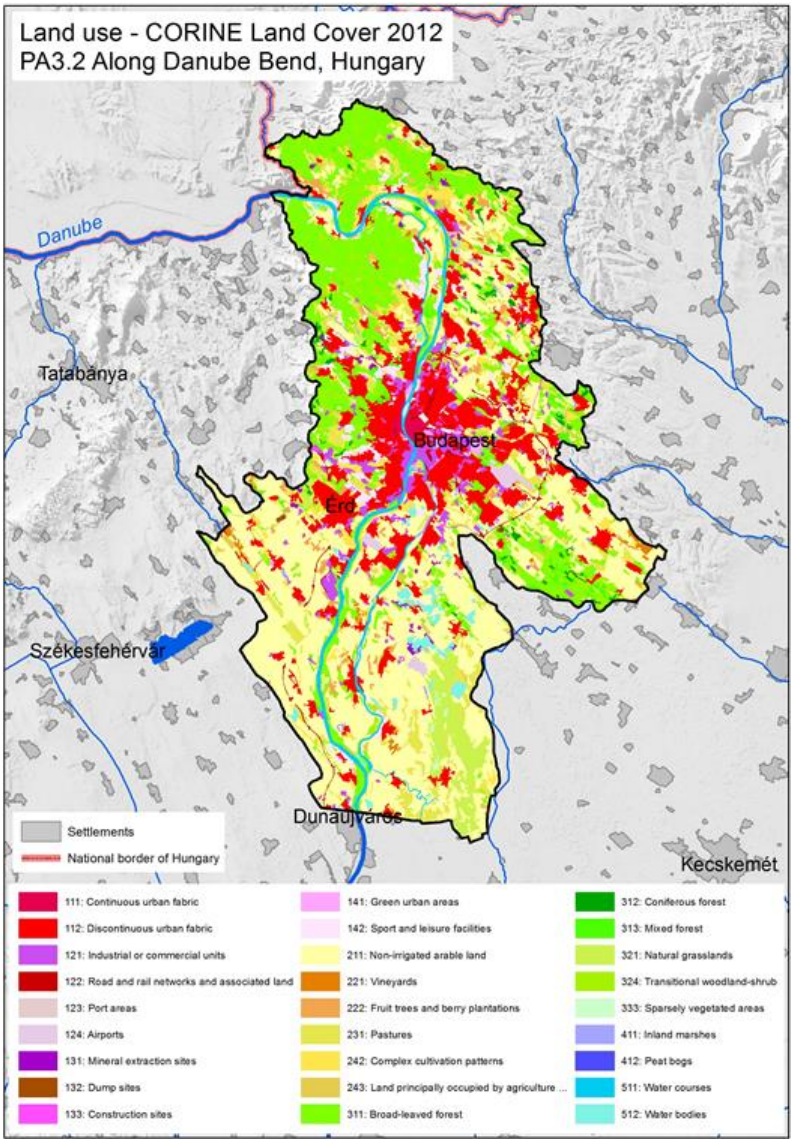

Figure 2: Land use on pilot area.

3.2.2. Household connections to sewage network on Szentendre Island

DMRV Zrt. made available their data on how many households have been connected to the sanitary network on Szentendre Island between 2004 and 2016 (*Table 4*). On the southern part of the island sewage network is not covering the whole inhabited area. Pócsmegyer and Szigetmonostor were mainly recreational areas with holiday homes which were not connected to the sewage network. Despite of that, there is a continuous increase in the number of residents.

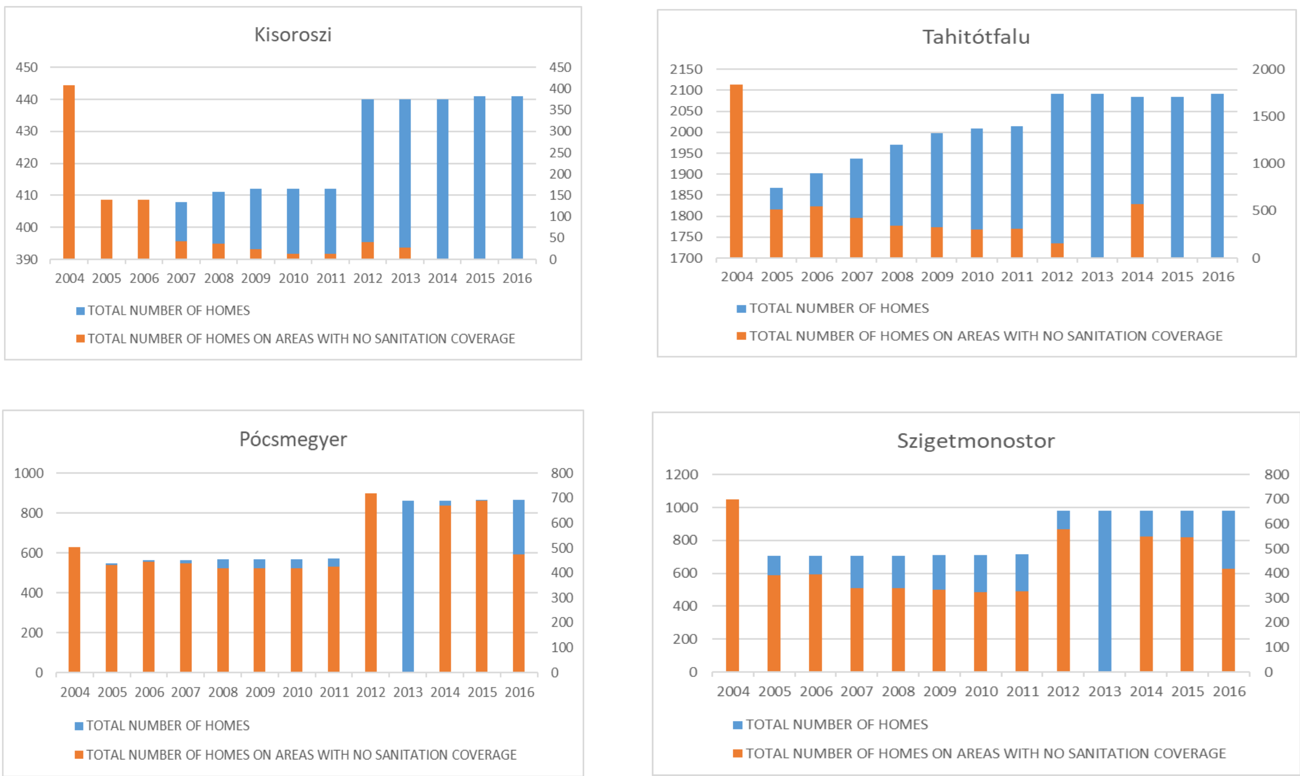

Figure 8. Diagram 1-4 showing sanitary coverage in four settlements on Szentendre Island (2004-2016).

Municipal sewage disinfection We also collected data on how sanitary coverage improved in the recent years. (Data is from *DMRV Zrt*.) The regional water utility supplier provided data from 2004 to 2016 for Vác, Dunabogdány, Tahitótfalu, Leányfalu, and Dunakeszi. Data are shown on *Diagram 5-9*. Sanitary coverage showed a 100% improvement between 2004 and 2016 in all five examined settlements. However, increasing nitrate concentration at Vác and decreasing, but still very high concentration values at Dunakeszi indicate improper/ illegal sewage handling or broken sewerage systems on those areas. Therefore, further investigation on those areas is necessary.

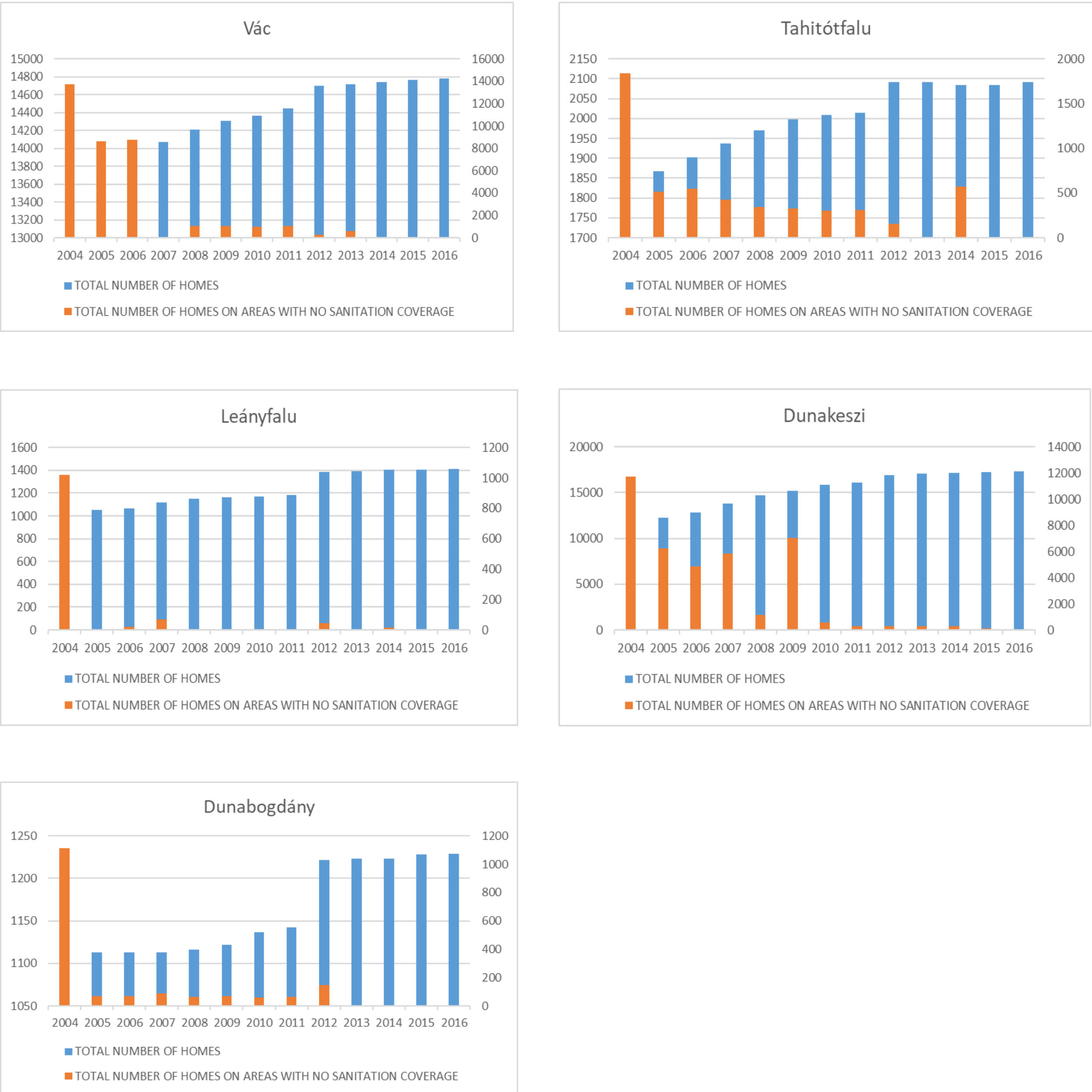

Figure 9. Diagram 5-9 showing sanitary coverage in five settlements on left and right bank of Danube around Szentendre Island (2004-2016).

Ensure the drinking water supply during high water or flood, to see if flood events have any significant impact on water chemistry we used water stage level reports and compared them with previously processed nitrate concentration data. We chose water stage levels measured at Nagymaros (*Fig. 8*). Open source data are available at hydroinfo.hu, the earliest digitalized report is from 2002.

At Nagymaros, flood warning levels are listed in Table 6.

Table 6: flood warning levels at Nagymaros.

flood warning level I	520 mm
flood warning level II	620 mm
flood warning level III	670 mm

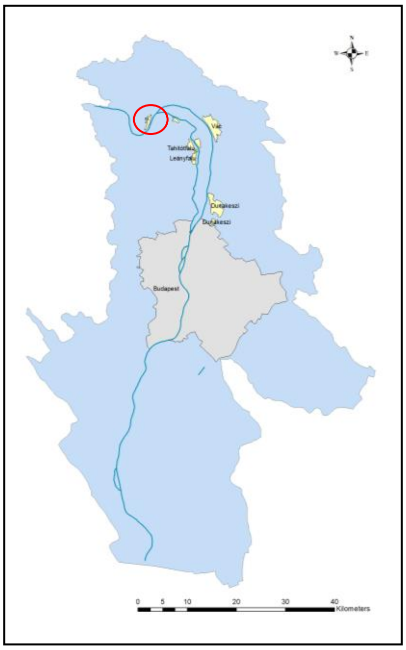

Figure 10: Red circle shows where Nagymaros is located.

Table 7: HHWs on Danube at Nagymaros between 2002-2017 (hydroinfo.hu).

	HHW [mm]
2002.08.18	701
2003.01.06	388
2004.06.06	341
2005.03.22	482
2006.04.04	713
2007.09.11	546
2008.07.26	352
2009.06.29	566
2010.06.10	677
2011.01.18	533
2012.06.06	363
2013.06.09	750
2014.05.19	413
2015.01.13	404
2016.07.17	381
2017.05.11	324

Table 6 shows highest water stage levels from 2002. During the last 15 years there were four level III warnings. No significant changes were detected in nitrate concentration related to those flood events on the right and left bank of the Danube around Szentendre Island. To assess flood related changes in water chemistry on Szentendre Island further data gathering is necessary.

3.3. Solutions for case specific adaptation of best management practices

Table 8: GAPs and proposed BMPs with recommendations for implementation in Pilot Action.

Actual management practice (GAP)		Nutrients used in agricultural production infiltrate into the soil causing groundwater contamination	Lack of proper sewerage system
Proposed BMP		Participation in Agro Environment Program	Municipal sewage disinfection
Proposed solutions and recommendations	adaptation of existing land use management practices	Such practices are already part of the program.	Not applicable
	Adaptation of existing flood/drought management practices	Such practices are already part of the program.	Not applicable
	Adaptation of policy guidelines	The Agro-Environmental Program is already based on existing policy guidelines.	There are already relevant existing policy guidelines.
Remaining issues to be solved		Data gathering on how many participants joined the National Agro-Environmental Program since it was first launched	Development of sanitary coverage in Pócsmegyer and Szigetmonostor, identify the contamination source at Dunakeszi

Actual management practice (GAP)		When flood occurs, the river may flood the well structures, or surface water can enter the wells.
Proposed BMP		Ensure the drinking water supply during high water or flood.
Proposed solutions and recommendations	adaptation of existing land use management practices	Not applicable
	Adaptation of existing flood/drought management practices	Management practices could be applied for better protection of the wells during floods.

	Adaptation of policy guidelines	There are no clear recommendations at present.
Remaining issues to be solved		- Further investigation of water chemistry measured in observation wells located on Szentendre Island - Revising flood management in context of future climate conditions

4. Conclusions

Data evaluation and comparisons showed improvement as well as deterioration in water quality on the Szentendre Island and around. On the right side of the Danube within the PA there is a significant improvement in both nitrate concentration reduction and sanitary coverage. On the left side of the Danube within the PA there is a slowly increase of nitrate concentration at Vác, and a decreasing, but still very high nitrate concentration at Dunakeszi, which could be a result of improperly handled sewage or broken sewerage system.

Proposed investigations for the future:

- continuous monitoring of water chemistry and flooding on Szentendre Island;
- collection of numerical data on how many participants joined the National Agro-Environmental Program on the PA;
- identify a pollution source at Dunakeszi and Vác and, if necessary, other settlements on the left side of the Danube.

Data gathering, and evaluation highlighted that nitrate concentration

- shows an overall decrease on the right side of the Danube (Dunabogdány, Tahitótfalu, Leányfalu);
- mostly stays below 50 mg/L;
- according to most of the wells on Buki Island, it increases at Vác;
- decreases at Dunakeszi, but above the limit in every observation well.

On Szentendre Island we examined changes of the concentration of five different chemical parameters (NH_4, NO_3, NO_2, SO_4, pesticides) which can be found in groundwater. WE used data series from monitoring wells as well as from drinking water production wells.

Monitoring wells

From the examined five parameters ammonium, nitrate and nitrite can come from agricultural production as well as from residential areas with a poor sanitary system, while sulphate is most commonly coming from sewage, and pesticides are obviously related to agricultural production. We found that NH_4 and NO_3 are the only parameters above limit in some wells, which makes it harder to identify the source of the pollution. However, information about land use can still be a clue. We found nine wells on the island with data series showing concentration values above limit. All nine wells are situated on non-irrigated arable land, which could mean that the main contamination source is probably the agricultural production. High concentration values measured in wells F_32 and F_37 could also be the result of the poor sanitary coverage of Pócsmegyer and Szigetmonostor.

Drinking water production wells

We examined data series from 1995 measured in 121 drinking water production wells located on Szentendre Island. Water quality in these wells is good, the most problematic area is the middle part of the island, around Pócsmegyer and Tahitótfalu, although pollutant concentrations are much lower than in observation wells.

To assess flood related contamination on Szentendre Island further investigation is necessary.

5. References

- Regional Waterworks Along Danube Ltd. (In Hungarian: Duna Menti Regionális Vízmű Zrt., DMRV Zrt.)
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