SOCIAL - ECONOMIC IMPACTS

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LIST OF ABBREVIATIONS

Short name	Full name
OTrT	National Spatial development Plan
KHV	Environmental impact assessment
KHT	Environmental impact study
HÉSz	Local Building Regulation
Gip	Economic, industrial building zone
KKÁT	Temporary storage facility for used nuclear assemblies
SZTK	Regulatory plan to be prepared
MTA	Hungarian Academy of Sciences
VKI	Water Directive
KSH	Central Statistical Office

9 SOCIAL-ECONOMIC IMPACTS

The north-south Danube valley can basically define the internal structure and regional relationships of Paks site and the region within a 30 km radius, and the spatial structure of the study area located on both sides is not coherent in profile, as cities were built on the west bank of Danube and thus have developed along the main roads running parallel with the Danube (M6 Motorway and Road No. 6.) as the axis of development – Dunaföldvár, Paks, Tolna, Szekszárd. On the east bank of Danube, there are some major settlements and they are also located along the main traffic routes on the Great Plain.

There was no east-west connection and it has not been developed since then either. A couple of years ago the Danube bridge at Szekszárd and the semi-lane version of M9 Motorway between M6 and Road No. 51. were built, and it resulted in significant changes in the spatial structure of the study area.

The ecological network and the designation of Natura 2000 areas will gradually the spatial structure of the study area, in addition to traffic developments.

9.1 URBAN, RURAL AND SPATIAL DEVELOPMENT STUDY OF THE STUDIED AREA WITHIN A 30 KM RADIUS

We studied the opportunities for urban, rural development and spatial development in the area through the settlement development and spatial development plans and the description of artificial (man-made) environment within a 30 km radius area based on data of the VÁTI Hungarian Regional and Urban Development Non-profit Ltd. and the development plans for the study area.

National, county and local (city/village) settlement plans and development concepts were used as the basis for the studies.

The study covers the settlement structure, land use, population distribution, cultural heritage protection, transportation routes, road, railway, waterway network profile related to the area of the settlements located in the relevant area. We also study the region economy, water and land use of the region.

9.1.1 NATIONAL SPATIAL DEVELOPMENT PLAN (OTRT)

Act XXVI of 2003 contains the National Spatial development Plan (short name: OTrT) and the country's structural plan, national regional zones and the rules applicable to these.

Regulations for land use and construction shall be prepared in the country's settlements and in various regions in conformity with this Act. Provisions of the Act shall be applied for preparing and approving the county's spatial development plans, and the settlement plan and the local building regulation.

The OTrT was last revised in 2013 (Act CCXXIX of 2013). The Act modified the revision frequency from the former 5 to 7 years, thus the next revision will be held in 2020.

Appendices of OTrT present:

- the Country Structural Plan (appendix 2. of the Act)

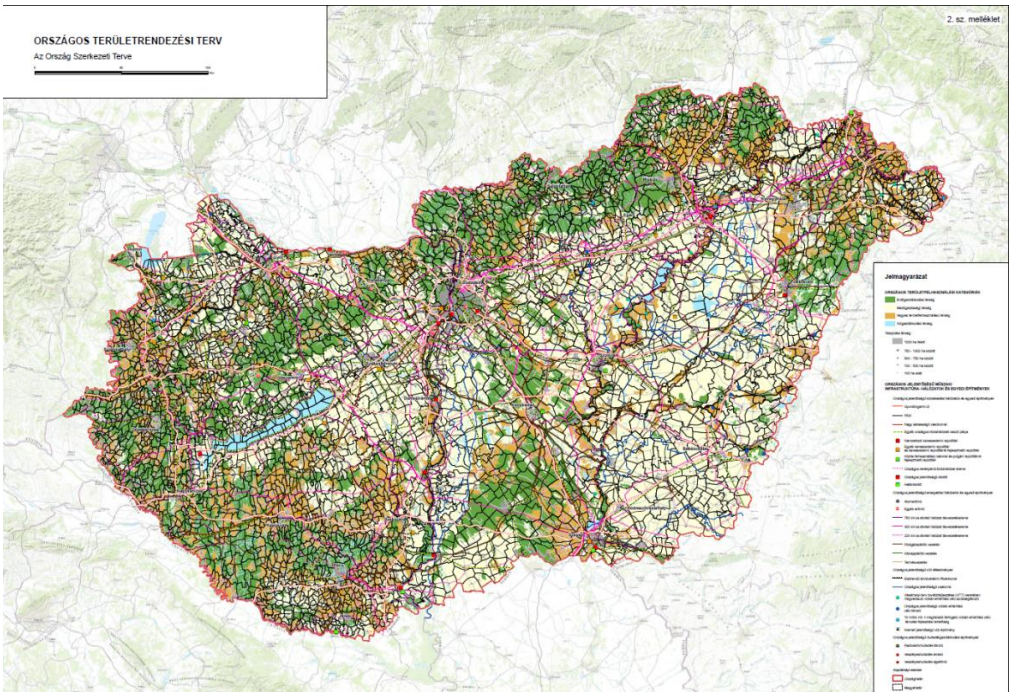


Figure 9.1.1-1: National Spatial development Plan – Country Structural Plan [9.1-1]

- borderlines of national zones:
  - National ecological network zone (appendix 3/1 of Act CCXXIX 2013)
  - Arable land zone with excellent production capacity (appendix 3/2.)
  - Arable land zone with good production capacity (appendix 3/3.)
  - Forest area zone with excellent production capacity (appendix 3/4.)
  - Landscape protection area zone with national significance (appendix 3/5.)
  - World heritage and world heritage-expectant area zone (appendix 3/6)
  - National water quality-protection area zone (appendix 3/7.)
  - Area zone for high-water river basin and reservoir to be implemented under the further development of Vásárhelyi Plan for water damage prevention (appendix 3/8.)
  - Defence area zone of outstanding importance (appendix 3/9.).

The OTrT also defines the categories of the high-priority regional and county zones that shall be applied in the high-priority regional and county development plans.

These are the following:

- core area
- ecological corridor
- puffer area
- area recommended for forestation
- mineral reserve area
- area exposed to regular inland inundation
- area exposed to geological danger
- defence area
- landscape protection area with regional significance

Other recommended county zone categories:

- farming region
- area that requires landscape rehabilitation
- area to be studied for installing wind turbine park
- regional flood risk management area.

Article 9 of the OTrT presents the details for regulation that are essential for the planned Nuclear Power Plant Developments, rules for the national technical infrastructure networks and individual buildings. Appendix 2 presents the location of the power plants and the electricity transmission line, and appendices 1/8, and az. 1/9. present the settlements that are dominant for the spatial system.

- *Act XXVI. of 2003. appendix 1/8.: Nuclear Power Plant and other power plants*

  17. Paks I.

  18. Paks II.

- *Act XXVI. of 2003. appendix 1/9.: elements of the electricity transmission line grid*

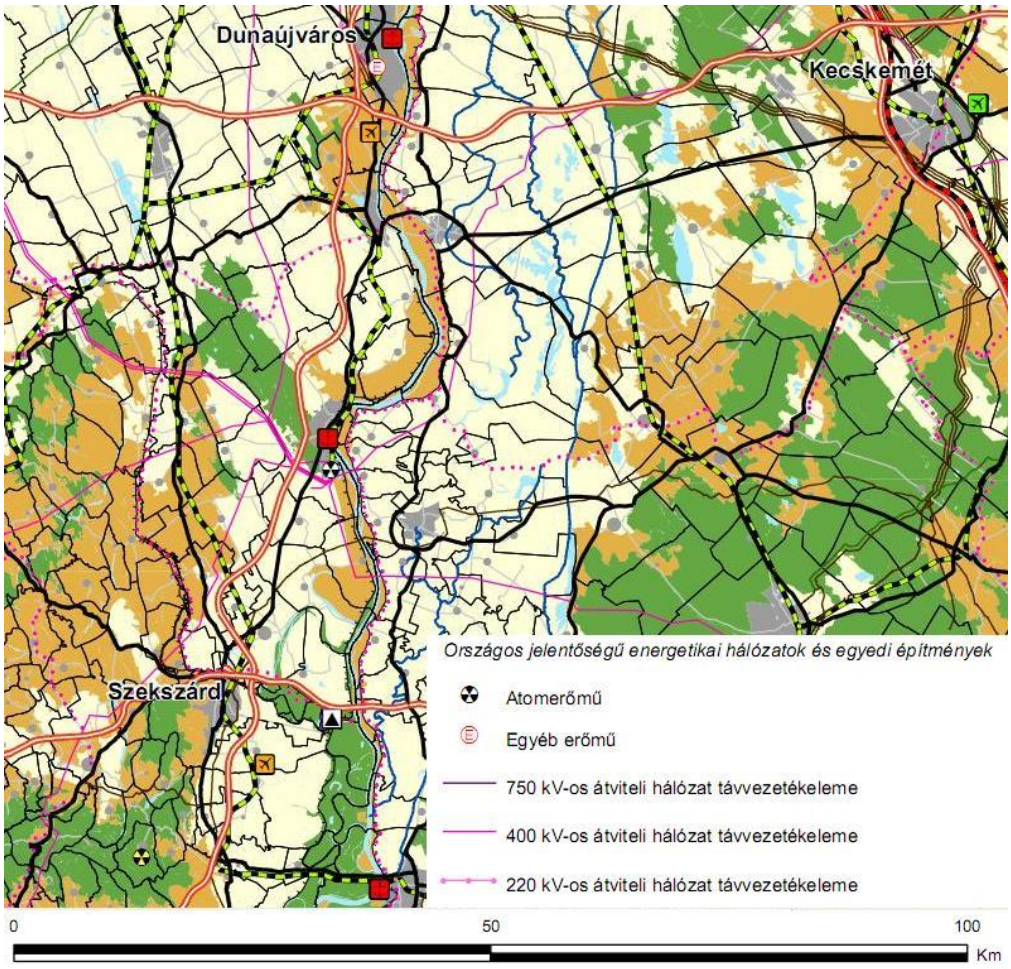
  2.43. Paks [I.]

  2.45. Paks [II.]

  2.46. Paks [III.]

The Act specifies that elements of the national technical infrastructure networks and the individual buildings described in appendices 1/8-9 shall be implemented next to the public administration area of the relevant settlements and in accordance with the national structural plan, and applying the corrections required due to criteria and requirements arising during the licensing process.

Thus the planned developments are in compliance with the provisions of the National Spatial development Plan.

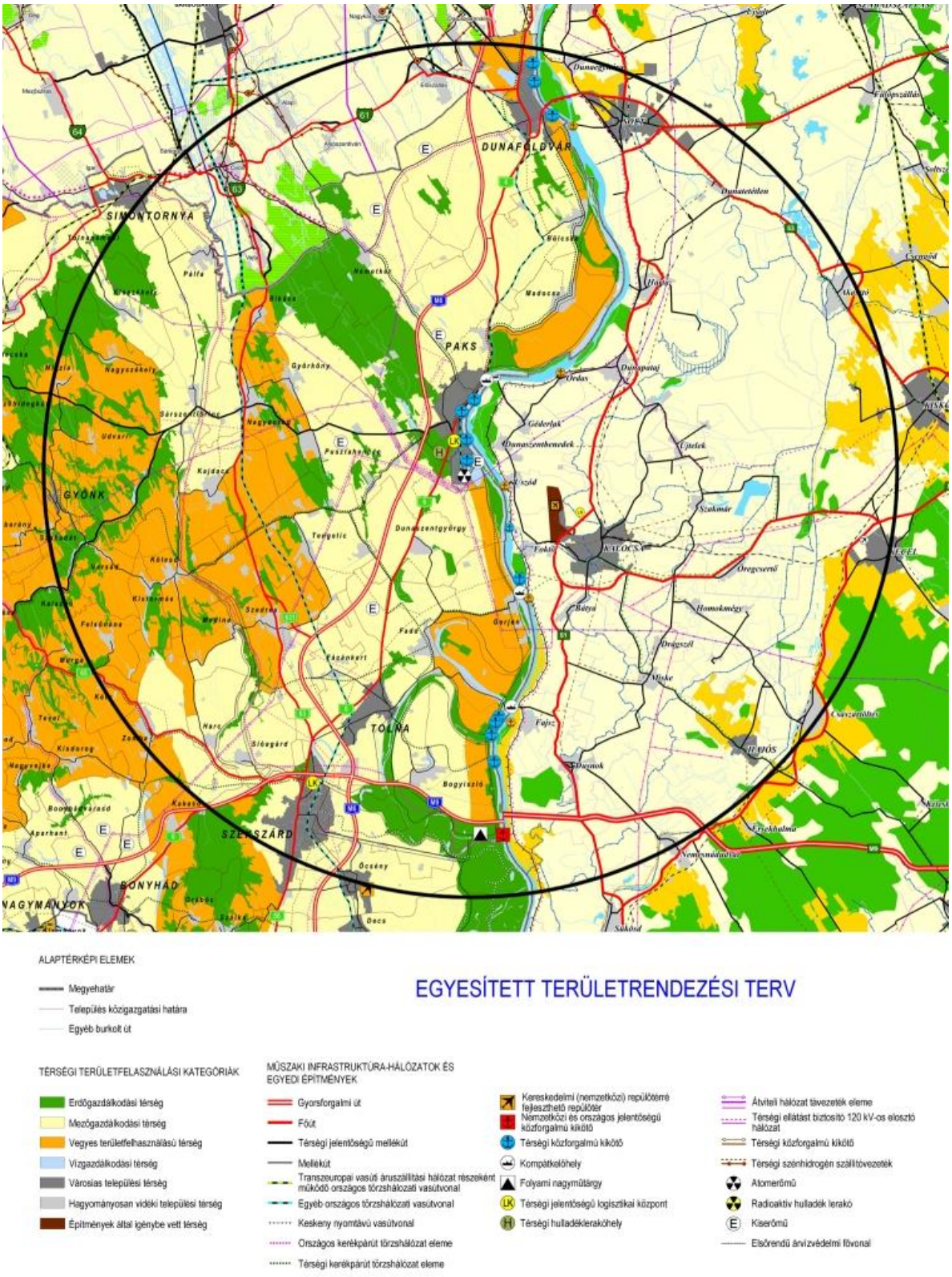


Legend:
atomerőmű – nuclear power plant, egyéb erőmű – other power plant, átviteli hálózat távvezetékeleme – transmission line element of the electricity grid

Figure 9.1.1-2: National Spatial development Plan – magnified detail of the Country Structural Plan for Paks region [9.1-1]

9.1.2 COUNTY SPATIAL DEVELOPMENT PLANS

The county's spatial development plans contain the given county's regional structural plan, the county's regional zones and the rules to be applied on such zones and they were prepared in harmony with these plans and in accordance with the OTrT.



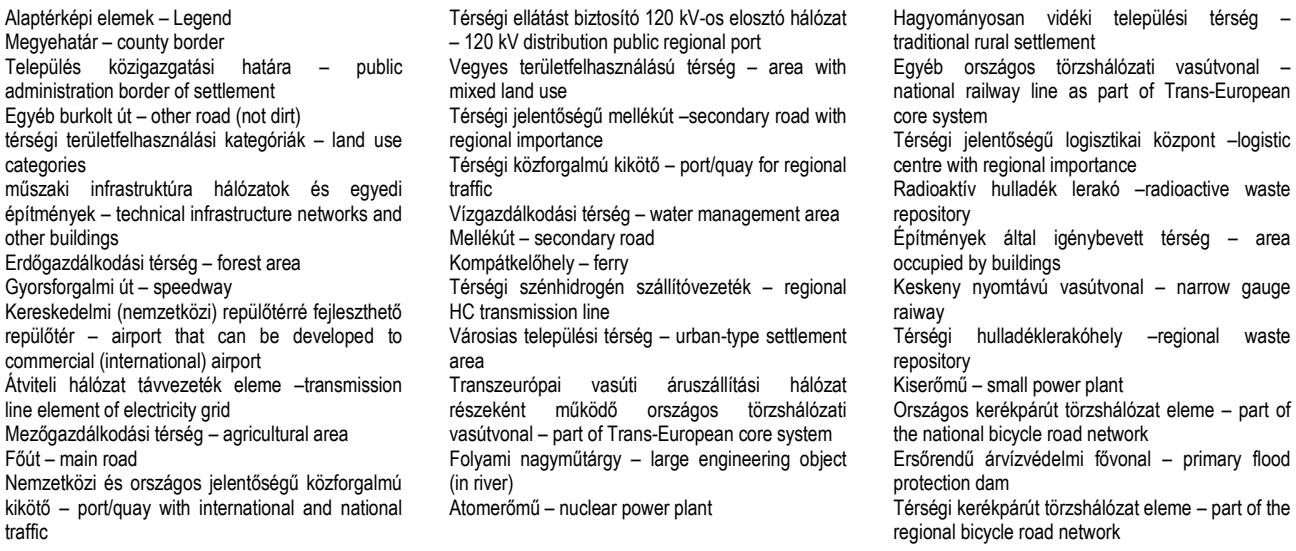


Figure 9.1.2-1: County Structural Plans - summarised for an area within a 30 km radius

The 2013 amendment of OTrT requires the revision of the county's settlement plans and it shall be performed by December 31, 2015 as prescribed by the Act. We prepared the KHV in accordance with the county's settlement plans in effect when the study was prepared and issued after the OTrT modification in 2008.

The area of study (within a 30 km radius) affects Tolna, Fejér and Bács-Kiskun counties, thus we described the region based on the details of the area within a 30 km radius covered in the three counties' settlement plans using the details of plan sheets of the three counties' settlement plans.

The county's zone plan sheets present the following areas in the relevant maps:

- arable land zone with excellent production capacity
- forest area zone with excellent production capacity
- landscape protection area zone of national significance
- landscape protection area zone with regional significance
- extremely sensitive underground water quality protection area zone
- surface waters water quality protection and water catchment area zone
- mineral reserve management area zone
- zone of regions that can be planned together
- existing defence area zone with extreme importance
- core area, ecological corridor and puffer area zone
- area zone for forestation
- area zone that requires regional complex landscape rehabilitation
- world heritage and world heritage-expectant area zone
- historic settlement area zone
- area zone regularly exposed to inland inundation
- high-water river basin zone
- area zone exposed to geological danger
- area zone exposed to water erosion
- area zone exposed to wind erosion

There are 75 settlements within 30 km radius of Paks Nuclear Power Plant and they are located in the territory of three counties, Fejér, Tolna and Bács-Kiskun:

Based on plan sheets of the settlement plans of the three counties we summarised the regional zones for the settlements located in the study area in Table 9.1.2-1, and we prepared the summarised plans for the studied areas within a 30 km radius based on the settlement plans.

The County Structural Plans contain at present the planned development, thus it is also in harmony with these Plans.

Settlement	COUNTRY AND COUNTY ZONES																				
	National ecological network			Area of excellent production capacity		Area zone for forestation	Landscape protection area of national significance	Landscape protection area of regional significance	World heritage and world heritage expectant area	Historical area	Extremely sensitive underground water quality protection area	Surface water quality protection and catchment area	Mineral reserve management area	Regions that can be planned together	Existing defence area with extreme importance	Defence area	Area requiring complex landscape rehabilitation	High-water river basin	Area exposed to geological danger	Area exposed to water erosion	Area exposed to wind erosion	Area regularly exposed to inland inundation
	Core area	puffer area	ecological corridor	arable land	forest																
Bikács	x		x	x	x	x	x												x	x	x	x
Bogyiszló	x		x	x	x	x		x			x		x					x				x
Bölcske	x		x	x	x	x		x	x		x		x				x	x	x			x
Dunaföldvár	x		x	x	x	x		x		x			x			x	x	x	x			
Dunaszentgyörgy	x		x	x	x	x			x										x			x
Fácánkert																					x	x
Fadd	x		x	x	x	x		x	x		x						x	x	x			x
Felsőnána			x	x	x	x		x											x	x		
Gerjen			x	x	x	x				x	x		x					x				x
Gyönk			x	x	x	x	x			x			x						x	x	x	x
Györköny	x		x	x	x	x													x	x	x	
Harc			x	x	x			x											x	x		x
Kajdacs	x		x	x	x	x							x							x	x	x
Kalaznó	x		x	x	x	x	x												x	x		
Kéty			x	x	x	x		x											x	x		
Kistormás			x	x	x	x	x												x	x		
Kisszékely	x		x	x	x	x	x												x	x		
Kölesd			x	x	x	x	x											x	x	x	x	x
Madocsa	x		x	x	x			x			x		x					x	x			x
Medina			x	x	x	x		x							x			x	x	x	x	x
Miszla	x		x	x	x	x	x												x	x		
Nagydorog	x		x	x	x	x		x											x	x	x	x
Nagyszékely	x		x	x	x	x		x											x	x		
Németkér	x	x	x	x	x	x		x											x	x	x	
Őcsény	x		x	x	x	x	x		x		x	x		x				x	x			x
Paks	x		x	x	x	x	x		x		x		x					x	x	x	x	x
Pálfa	x		x	x	x	x		x										x	x		x	x
Pusztahencse			x	x	x	x													x	x	x	

Settlement	COUNTRY AND COUNTY ZONES																					
	National ecological network			Area of excellent production capacity		Area zone for forestation	Landscape protection area of national significance	Landscape protection area of regional significance	World heritage and world heritage expectant area	Historical area	Extremely sensitive underground water quality protection area	Surface water quality protection and catchment area	Mineral reserve management area	Regions that can be planned together	Existing defence area with extreme importance	Defence area	Area requiring complex landscape rehabilitation	High-water river basin	Area exposed to geological danger	Area exposed to water erosion	Area exposed to wind erosion	Area regularly exposed to inland inundation
	Core area	puffer area	ecological corridor	arable land	forest																	
Sárszentlőrinc			x	x	x	x		x										x	x	x	x	x
Simontornya	x		x	x	x			x		x					x				x	x	x	x
Sióagárd	x		x	x	x	x		x						x				x	x		x	x
Szakadát			x	x	x	x		x											x	x		
Szedres			x	x	x	x		x										x		x	x	x
Szekszárd	x	x	x	x	x	x	x		x		x	x	x	x			x	x	x	x		x
Tengelic			x	x	x	x	x			x								x	x	x	x	
Tolna	x		x	x	x	x		x	x		x			x			x	x	x			x
Tolnanémedi	x	x	x	x	x	x		x											x	x	x	x
Udvari			x	x	x	x		x											x	x		
Varsád			x	x	x	x		x											x	x		
Zomba			x	x	x	x		x											x	x		
Akasztó	x	x	x					x			x	x	x				x				x	x
Bátya	x		x	x				x			x							x				
Császártöltés	x		x	x	x	x		x					x				x		x	x	x	x
Drágszél		x	x	x		x																x
Dunaegyháza			x	x	x			x			x							x		x	x	
Dunapataj	x	x	x	x	x			x		x	x	x						x			x	x
Dunaszentbenedek	x		x	x	x			x				x						x			x	x
Dunatetétlen	x	x	x					x													x	x
Dusnok	x		x	x	x	x					x	x					x			x	x	x
Fajsz	x		x	x	x			x			x	x						x				
Foktő	x		x	x				x			x	x	x				x	x			x	
Géderlak			x	x								x	x					x			x	x
Hajós	x		x	x	x		x			x			x				x		x	x	x	x
Harta	x	x	x	x							x	x	x				x	x		x	x	x
Homokmégy	x	x	x	x	x	x		x					x				x		x	x	x	x
Kalocsa			x	x			x			x					x		x				x	x

Settlement	COUNTRY AND COUNTY ZONES																				
	National ecological network			Area of excellent production capacity		Area zone for forestation	Landscape protection area of national significance	Landscape protection area of regional significance	World heritage and world heritage expectant area	Historical area	Extremely sensitive underground water quality protection area	Surface water quality protection and catchment area	Mineral reserve management area	Regions that can be planned together	Existing defence area with extreme importance	Defence area	Area requiring complex landscape rehabilitation	High-water river basin	Area exposed to geological danger	Area exposed to water erosion	Area exposed to wind erosion	Area regularly exposed to inland inundation
	Core area	puffer area	ecological corridor	arable land	forest																
Kecel	x	x	x		x	x		x					x				x		x	x	x	x
Kiskőrös	x		x		x	x		x									x				x	x
Miske			x	x		x					x						x				x	x
Nemesnádudvar	x	x	x	x			x					x	x				x		x	x	x	x
Ordas			x	x				x			x	x	x					x				x
Öregcsertő	x	x	x		x	x		x					x				x		x		x	x
Solt	x	x	x	x		x		x		x	x		x				x	x		x	x	x
Sükösd	x	x	x	x	x			x			x	x	x				x		x	x	x	x
Szakmár	x	x	x	x								x	x				x		x		x	x
Újtelek	x	x		x								x									x	
Uszód			x	x							x	x									x	
Alap	x	x	x	x	x	x														x	x	x
Alsószentiván	x		x	x	x	x		x												x	x	
Cece	x		x		x	x		x												x	x	x
Daruszentmiklós	x		x		x	x		x									x				x	
Előszállás	x		x	x	x	x		x												x	x	
Nagykarácsony	x	x	x	x		x														x	x	
Sáregres	x	x	x	x	x	x		x												x	x	x
Vajta	x		x		x	x		x									x			x	x	x

Table 9.1.2-1: Regional land use broken down to categories

9.1.2.1 Settlement structure

There are 75 settlements on the study area within 30 km radius of Paks, including 1 county capital, 10 cities, 7 large villages and 57 villages.

The settlement network is very articulated in the region: larger settlements are rather concentrated in the region next to Danube river, while small and minor villages can be rather found in areas farther from Danube in the Great Plain region. Despite the most varied settlement network in the Szekszárd small region the number of small and minor villages is significant (23), but the number of cities and large villages is also significant (18). Paks small region has two cities surrounded with a dominantly „small-medium village" zone (1000-2000 people), where there are only three small and minor villages.

Legend:
Lakosság megoszlása települések szerint – Population broken down to settlements:
város – city
nagyközség – large village
község – village
aprófalu – small village

Dense city network is located in the Danube flood zone: minor cities evolved along the "defence line" made of Dunaföldvár, Solt, Paks, Kalocsa, Tolna, Szekszárd. Dunaföldvár and Simontornya, next to Mezőföld and Tolna hills.

The urbanisation „boom" of the last decade also hit the region: population of settlements recently declared as cities is still lower than 3 000, whereas villages with major and more significant micro-centre role did not apply for city tanking (or they did, but were rejected). We can see that city network development and spatial development criteria had no or very little weight in granting the "city" ranking.

In addition to high level urbanisation small and minor villages form the other pole of settlement structure. e This settlement type forms a minor slice of the settlement structure due to historic and nature-geographic reasons, but their number is still dominant. The population is lower than 1 000 in nearly one-third of the settlements, among them 12 are small villages with lower than 500 population. Only 5.62 % of the population of the study area lives in total 23 villages where the population is lower than 1 000.

Increasingly differentiating farms are very characteristic to the South-Great Plain settlement network that form organic parts of several settlements. Significant role of garden plots in the settlements' landscape use is typical for South-Transdanubia.

We summarised the structural description of settlements within a 30 km radius of the site and the dominant economic activities in Table 9.1.2-2.

Settlement	Town/village	Structural description	Changes to population, business activities determining the urban landscape
Tolna county			
Bikács	v	village with long, narrow plots	decreasing, mainly agriculture
Bogyiszló	v	dead-lock village, block village	decreasing, mainly agriculture, big cities in the neighbourhood
Bölcske	v	block village	growing, mainly agriculture
Dunaföldvár	T	small town, traffic junction	growing, mixed, industrial park
Dunaszentgyörgy	v	block village	stagnating, agriculture, power plant
Fácánkert	v	village with parallel streets	stagnating
Fadd	v	village with parallel streets	decreasing, agriculture
Felsőnána	v	village with long, narrow plots	decreasing, agriculture
Gerjen	v	village with parallel and perpendicular streets	stagnating, agriculture
Gyönk	t	town with parallel streets	decreasing, agriculture
Györköny	v	village with parallel streets	decreasing, agriculture
Harc	v	village with parallel streets	decreasing, agriculture
Kajdacs	v	village with parallel streets	stagnating, agriculture
Kalaznó	v	village with long, narrow plots	decreasing, agriculture
Kéty	v	village with parallel streets	decreasing, agriculture
Kistormás	v	village with long, narrow plots	decreasing, agriculture
Kisszékely	v	village with long, narrow plots	decreasing, agriculture
Kölesd	v	village with parallel streets	stagnating, agriculture
Madocsa	v	block village	stagnating, agriculture
Medina	v	village with long, narrow plots	decreasing, agriculture, commuting
Miszla	v	village with long, narrow plots	decreasing, agriculture
Nagydorog	v	village with parallel streets	decreasing, agriculture, commuting
Nagyszékely	v	village with parallel streets	decreasing, agriculture
Németkér	v	village with parallel streets	decreasing, agriculture, commuting
Őcsény	v	parallel and perpendicular streets	decreasing, agriculture, commuting
Paks	T	parallel and perpendicular streets	growing, industry, regional centre
Pálfa	v	parallel and perpendicular streets	decreasing, agriculture
Pusztahencse	v	village with long, narrow plots + parallel and perpendicular streets (new part)	stagnating, commuting (Paks)
Sárszentlőrinc	v	village with parallel streets	decreasing, agriculture
Simontornya	T	parallel and perpendicular streets	decreasing, country town
Sióagárd	v	village with parallel streets	stagnating, commuting (Szekszárd)
Szakadát	v	village with long, narrow plots	decreasing, agriculture, construction industry
Szedres	v	village with parallel streets	decreasing, agriculture, commuting (Tolna, Szekszárd)
Szekszárd	T	county town	decreasing, industry
Tengelic	v	village with long, narrow plots	decreasing, agriculture
Tolna	T	parallel and perpendicular streets	decreasing, industry, agriculture
Tolnanémedi	v	village with parallel streets	decreasing, agriculture
Udvari	v	village with long, narrow plots	decreasing, agriculture
Varsád	v	village with long, narrow plots	decreasing, agriculture
Zomba	v	village with long, narrow plots	stagnating, agriculture, commuting (Szekszárd)
Bács-Kiskun county			
Akasztó	v	block village	stagnating, agriculture, tourism
Bátya	v	parallel and perpendicular streets	stagnating, agriculture, commuting (Kalocsa)
Császártöltés	v	parallel and perpendicular streets	stagnating, agriculture
Drágszél	v	village with long, narrow plots	growing, agriculture, commuting (Kalocsa)
Dunaegyháza	v	parallel and perpendicular streets	growing, agriculture, commuting (Dunaújváros)
Dunapataj	v	block village	stagnating, agriculture, tourism
Dunaszentbenedek	v	block village	stagnating, agriculture, commuting
Dunatetétlen	v	parallel and perpendicular streets	stagnating, agriculture, commuting

Settlement	Town/village	Structural description	Changes to population, business activities determining the urban landscape
Dusnok	v	parallel and perpendicular streets	decreasing, agriculture
Fajsz	v	parallel and perpendicular streets	decreasing, agriculture
Foktő	v	block village	decreasing, agriculture
Géderlak	v	village with several streets of long, narrow plots	stagnating, agriculture
Hajós	t	parallel and perpendicular streets	decreasing, tourism, agriculture
Harta	v	parallel and perpendicular streets	decreasing, agriculture
Homokmégy	v	village with several streets of long, narrow plots	decreasing, agriculture
Kalocsa	T	block town	decreasing, agriculture, food industry, other industry
Kecel	T	block town	stagnating, agriculture
Kiskőrös	T	block town	stagnating, agriculture, industry, services
Miske	v	village with several streets of long, narrow plots	decreasing, agriculture
Nemesnádudvar	v	village with several streets of long, narrow plots	decreasing, agriculture, timber industry
Ordas	v	village with several streets of long, narrow plots	decreasing, agriculture
Öregcsertő	v	village with long, narrow plots	decreasing, agriculture
Solt	T	block town	decreasing, agriculture, traffic junction
Sükösd	v	parallel and perpendicular streets	decreasing, agriculture
Szakmár	v	village with several streets of long, narrow plots	decreasing, local businesses, agriculture
Újtelek	v	village with long, narrow plots	decreasing, agriculture
Uszód	v	block village	decreasing, agriculture
Fejér county			
Alap	v	village with long, narrow plots	decreasing, agriculture
Alsószentiván	v	village with long, narrow plots	decreasing, agriculture
Cece	v	village with several streets of long, narrow plots	decreasing, agriculture
Daruszentmiklós	v	village with long, narrow plots	decreasing, agriculture
Előszállás	v	village with several streets of long, narrow plots	stagnating, agriculture, commuting (Dunaújváros)
Nagykarácsony	v	parallel and perpendicular streets	decreasing, agriculture
Sáregres	v	village with several streets of long, narrow plots	decreasing, fish farming, agriculture
Vajta	v	village with long, narrow plots	growing, agriculture

Table 9.1.2-2: Structural description of the studied settlements [9.1-2]

Medical or healthcare institutions with a 30 km radius of the site:

Hospitals:

- Tolna county Balassa János Hospital, Szekszárd
- Bács-Kiskun County Hospital, Szeged University of Sciences, Faculty of General Medical Sciences Hospital - Saint Cross Hospital

Other medical or healthcare institutions:

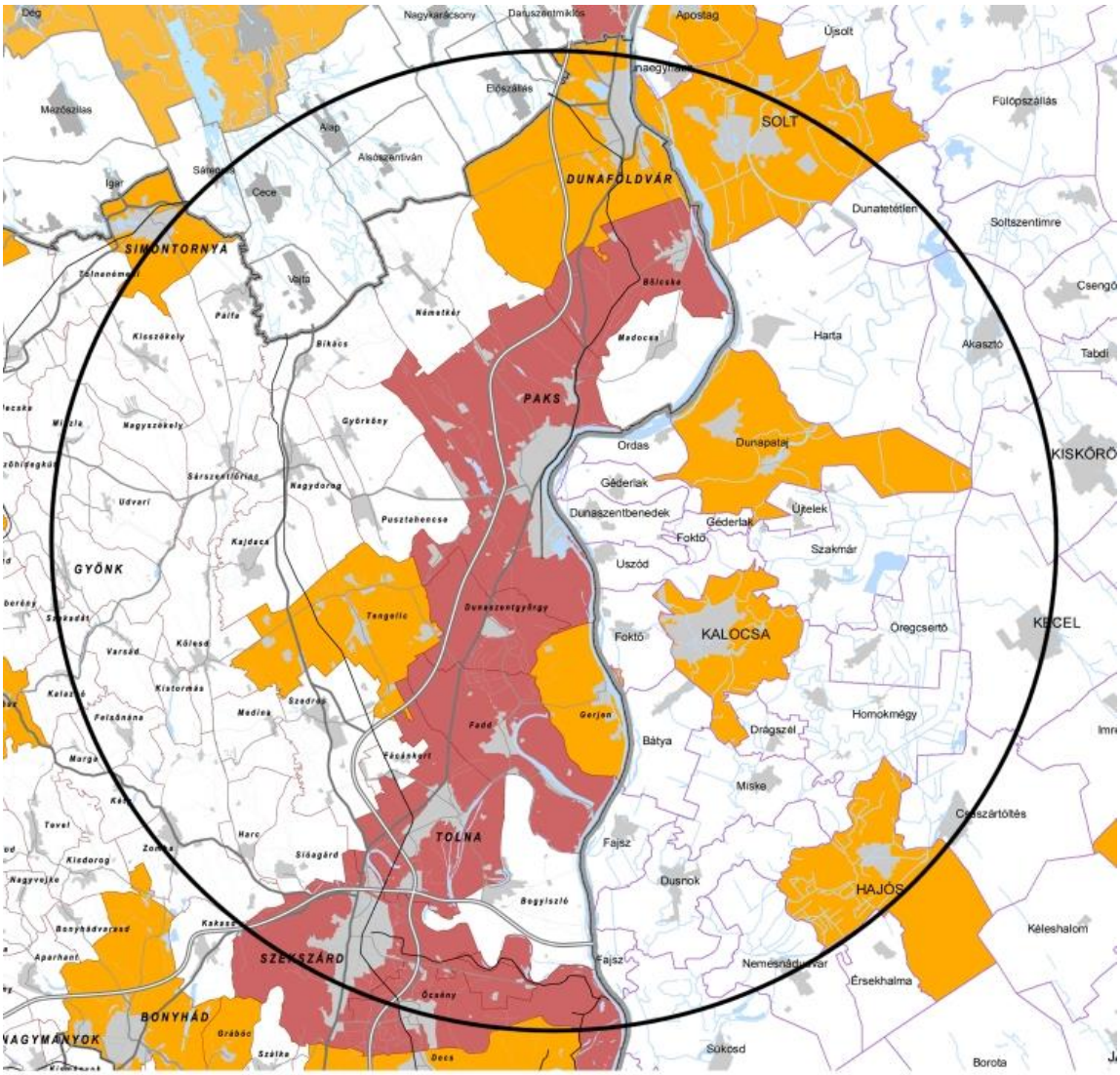
- Ambulance stations:
  - Tolna county:
    - Dunaföldvár
    - Paks
    - Simontornya
    - Szekszárd
  - Bács-Kiskun county:
    - Kalocsa
    - Kiskőrös
- Polyclinics:
  - Tolna county:
    - Szekszárd
    - Paks
  - Bács-Kiskun county:
    - Kiskőrös
    - Kalocsa

9.1.2.2 Cultural heritage protection

The 2013 amendment of OTrT upgraded the high-priority regional and county level up to national level of the world heritage and world heritage-expectant area zone: the zone defined in the national spatial development plan, and applied in the high-priority regional and county spatial development plans. Areas enlisted on the World Heritage List, and areas that can meet the professional conditions for world heritage selected by a body empowered by laws of Hungary as a stakeholder state to become site candidates for World Heritage List belong to this category in accordance with the 1972 UNESCO Treaty on the protection of the world cultural and natural heritage.

Area zones that need to be specifically managed from cultural heritage aspects were deleted from the OTrT.

As set out in the present regulation: "traffic and energy infrastructure networks, power plants and small power plants shall be implemented on world heritage and world heritage-expectant areas securing safety and integrity of cultural and natural heritage values, protecting their coherence, promoting their visual appearance and in conformity with the world heritage management plan."



Legend:
Világörökség és világörökség-várományos terület– World heritage and world heritage expectant area
történeti települési terület – historic settlement area
Megyehatár – county border
Település közigazgatási határa – administrative boundaries of settlement
Települési terület – settlement area
Vízfelület, vízfolyás – surface water,
Világörökség és világörökség-várományos terület – Zone of world heritage and world heritage-expectant areas

Figure 9.1.2-2: World heritage and world heritage-expectant area and historic settlementi area zone - summarised for an area within a 30 km radius

At the moment, no sites within the territory subject to the examination are part of the world heritage, however, several sites proposed to be awarded this title have been specified:

- The Hungarian section of the Roman Limes as part of the (Cultural) international serial nomination
- The network of rural heritage buildings in Hungary (Cultural)

The settlements affected: Bölcske, Paks, Dunaszentgyörgy, Fadd, Tolna, Szekszárd, Őcsény.

The project titled "Danube Limes UNESCO World Heritage"

The project titled "Danube Limes UNESCO World Heritage" is managed by Gyula Forster National Centre for Cultural Heritage Management (previously called: the National Office for Cultural Heritage). The purpose of the cooperation between Hungary, Slovakia, Poland, Germany and Austria is to prepare the Danube limes section constituting a special part of the frontiers of the Roman Empire for the world heritage nomination (source: http://danube-limes.eu).

This line connects the fortified points found in Dunaföldvár, Bölcske, Paks (Lussonium), Tolna (Alta Ripa), Őcsény (Alisca) and Szekszárd (Alisca). From the sites included in the Hungarian nomination documents it is the Lussonium located at Paks-Dunakömlőd which is within the territory subject to the current examination.

Up to this date, there have been no conciliations on the matter in Paks where one of the limes flagship project titled "Lussonium" was prepared. Lussonium used to be a Roman military settlement near Paks-Dunakömlőd; the ruin garden is open to visitors at the moment as well. The Lussonium project is a program directly financed by the European Union, realized by means of international cooperation and aimed at nominating the Central-European part of the Roman age Danube limes as an archaeological remains constituting part of the European cultural heritage to the UNESCO list of world heritage sites. Hungary was represented in the programme titled the "Frontiers of the Roman Empire" by the Gyula Forster National Centre for Cultural Heritage Management, the University of Paks and the municipality of Paks. The task of the National Centre and the University was to compile the application documentation, whereas the Municipality of Paks participates in the programme with the Lussonium-Roman age fortress. The Lussonium would be floodlit and a visitors' centre would established at the military camp as part of the planned investment.

The specification of the borderlines of the Limes sections of Dunaföldvár has been prepared, however, the participants at the conciliation objected to its nomination.

The network of rural heritage buildings in Hungary

The item "The network of rural heritage buildings in Hungary" has been added to the tentative list in 2000. The network of rural heritage buildings presents the characteristic architecture, economy, tools and devices and dresses of a given religion, settlement or ethnical group of the period between the 18th and the 20th century. The continuous operation of these buildings and the organisation of related programmes contribute to the preservation of the traditions and local popular customs of a given region and the strengthening of the togetherness in a given community. The preservation and presentation of the values (rural heritage buildings) of the various regions and communities together, in the same manner and with scientific thoroughness is unparalleled in Europe. There is a rural heritage building in the territory subject to the examination, namely in Sióagárd.

9.1.2.2.1 Building under protection of monuments on the study area

The protected historical monuments in the territory subject to the examination are listed below based on the Historical Monuments Register of Hungary. [9.1-3]

TOLNA COUNTY

Bikács: Lutheran church

Bogyiszló: Reformed church

Bölcske: Reformed church, Reformed school, Roman Catholic church, Szakáts castle

Dunaföldvár: Residential building – Béke square 1; Chapel of St John of Nepomuk; Calvary, Greek Orthodox church; Reformed church and parsonage, Roman Catholic Franciscan church, Franciscan convent, Castle, Chapel of St Rokus, Downtown Roman Catholic Church, Holy Trinity statue

Dunaszentgyörgy: Reformed church

Fadd: Reformed church

Felsőnána: Lutheran church

Gyönk: Residential building and farm buildings – Magyarhegy str. 158; Reformed church, Magyary-Kossa Castle, the cow stable in Szabadpuszta

Györköny: Lutheran church, residential building at Kossuth L. str. 326, Cellar – press-house

Harc: Roman Catholic church

Kajdacs: Sztankovánszky mausoleum, Roman Catholic church

Kalanzó: Lutheran church

Kéty: Roman Catholic chapel

Kisszékely: Roman Catholic church

Kistormás: Lutheran church

Kölesd: Reformed church, Parsonage of the Reformed church, manorial guesthouse, the Petőfi memorial apiarian house; chapel of St John of Nepomuk, Jeszenszky castle

Madocsa: Reformed church

Medina: Greek Orthodox church, Reformed church, Roman Catholic chapel, Apponyi mansion

Miszla: Residential building – Bikádi str. 83; Roman Catholic church, Reformed church and parsonage

Nagydorog: Reformed church

Nagyszékely: The building complex of the Reformed church, residential building at Táncsics str. 17

Németkér: Roman Catholic church

Őcsény: Reformed church

Paks: Daróczy mansion, residential building at Anna str. 17, Cseh-Vigyázó mansion later called Mádi Kovács mansion, Korniss mansion, Residential building (clinic) – Deák F. str. 7, Novák mansion – Deák F. str. 11; Mansion (consulting room) – Deák F. str. 22, St Wendelin chapel, Residential building (primary school) – Kossuth str. 2, Mansion – Kossut str. 13, Roman Catholic chapel, Holy Trinity pillar, Residential building (Szeniczey house) – Szentháromság sq. 5, Elisabeth Hotel, Bazaar row – Szent István square 7; Calvary Chapel, Reformed church, Residential building (primary school) – Templom square 6, Roman Catholic chapel (Resurrection of Christ), Roman Catholic church (St Emeric), the remains of the Roman age military camp

Pálfa: Roman Catholic church

Sárszentlőrinc: Lutheran church, Residential building (Petőfi Memorial House) – Petőfi str. 12, Secondary Grammar School of the Reformed Church (residential building) - Petőfi sq. 1, Hajdú house - Petőfi sq. 2

Simontornya: Franciscan covenant, Roman Catholic Franciscan church, Castle, The historical surroundings of the castle

Sióagárd: Residential building and farm buildings (rural heritage building) – Zrínyi str. 31; Ruins of Janyavár

Szedres: Balogh-(Illés) Castle, Roman Catholic chapel

Szekszárd: The birth house of Babits Mihály – Babits M. str. 13, Roman Catholic parish church, Holy Trinity pillar, County house and church ruins, Town Hall, Roman Catholic parsonage, The chapel of St John and St Paul, Francis Hospital, Press houses - Béri Balogh Ádám str. 91/a, b, c, 92, 92/a, 93/a, Krehmüller house (Document bureau) - Bezerédj István str. 1, Farm house – Csatári str., Nedelkovics farmhouse – Cserfa str, Inn – Dózsa György str. 9, School – Garay sq. 9, Kamarás house – Kadarka str. 16, Roman Catholic Calvary church and stations of the cross, Bailiff's house – Széchenyi str. 23, Táncos Restaurant, Szegzárd (Garay) Hotel, Augusz house complex (musical school), Wosinsky Mór County Museum, Stone coat of arms – Szent István sq. 26, Synagogue, Bogár farm house – Szőlőhegy str. 52-54, Millennium Pavilion

Tengelic: Jeszenszky castle, Gindly-Benyovszky mansion and castle, Schnell castle, Bernrieder castle, Roman Catholic chapel

Tolna: Roman Catholic Calvary chapel, Festetics castle, Statue of St John of Nepomuk, Statue of St Sebastian, Roman Catholic church, Roman Catholic parsonage, Holy Trinity pillar, Roman Catholic church

Tolnanémedi: Reformed church

Udvari: Lutheran church, Roman Catholic church, Roman Catholic chapel

Varsád: Lutheran church

Zomba: Roman Catholic church

BÁCS-KISKUN COUNTY

Akasztó: Roman Catholic church

Bátya: Statue of St John of Nepomuk, Roman Catholic church and parsonage

Császártöltés: Folk buildings – Kossuth str. 132

Dunaegyháza: Residential building (rural heritage building) – Ady Endre str. 15, Lutheran church

Dunapataj: Residential building – Bem József str. 34, The historical surroundings of the Reformed church, Reformed church, Residential building and smithery (rural heritage building) - Jókai Mór str. 8, Residential building (museum) - Jókai Mór str. 10, Roman Catholic church, Servant house - Ordasi str. 21, Parish hall

Foktő: Reformed church, Roman Catholic church

Géderlak: Roman Catholic church

Hajós: The historical surroundings of the Roman Catholic church and the Archbishop's castle, Archbishop's castle, Roman Catholic church, Statue of St John of Nepomuk, Roman Catholic parsonage, Cellar and press-house – Présház str. 93

Harta: Lutheran church, Reformed church

Kalocsa: Protected historical area – Inner City, Canonry house – Asztrik sq. 1, Convent, church and girls' education institute, Barn-house of the Archdiocese, Katona house – Hunyadi János str. 2, Residential building – Hunyadi János str. 5, Secondary Grammar School, Stable of the Archdiocese, Large seminary, Huber house – Szent István király str. 6, Small seminary, Jesuit monastery and church, Residential building – Szent István király str. 1-3, Holy Trinity pillar, Cathedral, Archbishop's castle, Residential building – Szentháromság sq. 2-3, House of the vidame of the Archdiocese

Kecel: Roman Catholic cemetery chapel, Roman Catholic church

Kiskőrös: Residential building (birth house of Petőfi) – Petőfi Sándor sq. 5, Bust of Sándor Petőfi, Synagogue, Residential building (Slovakian rural heritage building) - Szent István str 23

Miske: Statute of St John of Nepomuk

Nemesnádudvar: Roman Catholic church

Ordas: Reformed church

Solt: Residential building (rural heritage building) – Deák Ferenc sq. 3; Vécsey castle, Dézsma cellar – Meleghegy, Press house and wine cellars - Meleghegy 536, 565

Sükösd: Roman Catholic church, St Ann chapel

Uszód: Residential building – Batthyány str. 5

FEJÉR COUNTY

Cece: Csók István memorial museum, Roman Catholic church, Reformed church

Előszállás: Roman Catholic church, Cistercian monastery

Sáregres: Water mill

Vajta: Zichy castle

9.1.3 PAKS CITY LOCAL BUILDING REGULATION - REGULATORY PLAN

The Zoning Ordinance (hereinafter: the "HÉSz") and the Zoning Plan of the City of Paks were enacted by the Municipality of Paks by Ordinance No. 24/2003. (XII. 31.) of the Municipality, which was amended by Ordinances No. 23/2011. (XI. 25.) and 39/2013. (XII. 21.) of the Municipality. The Municipality of the City of Paks conducted its process aimed at the amendment of the documents of urban planning (Settlement Structure Plan, Zoning Ordinance and Zoning Plan) in accordance with Government Decree No. 314/2012. (XI.8.) on the concept of urban development, the strategy of integrated urban development, the documents of urban planning and on certain particular legal institutions of urban planning. The amended documents of urban planning have been in effect since January 30, 2014.

The Hungarian Atomic Energy Authority detected an error in the effective Zooning Plan in the definition of the nuclear safety zone of Paks Nuclear Power Plant, which is being corrected in a negotiated procedure based on Article 42 of Government Decree No. 314/2012. (XI.8.).

The premises of the existing 4 units of Paks Nuclear Power Plant and the planned premises of the new units are indicated in Zoning Map Sheets No. B26 and B27 regulating areas within the city limits.

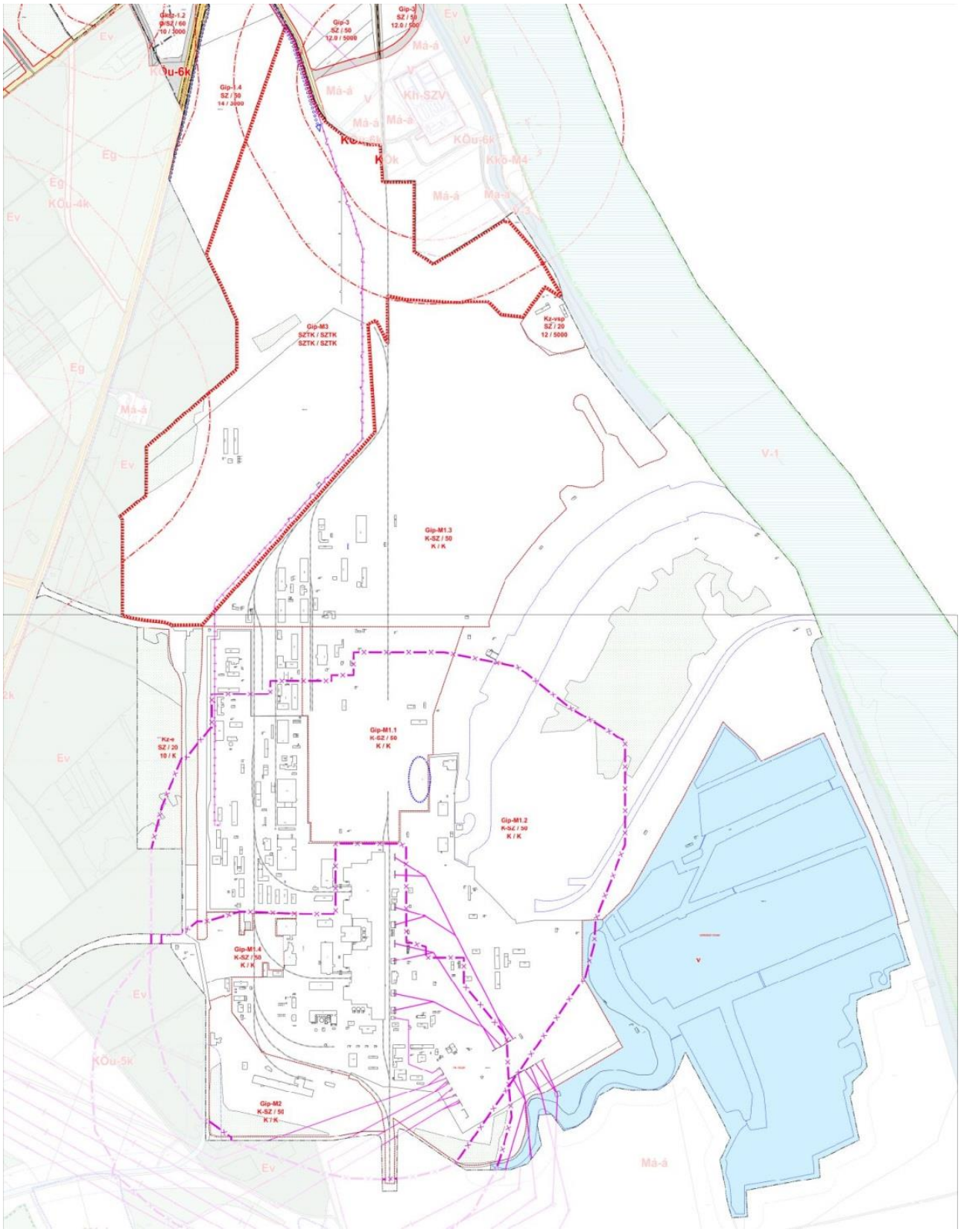


Figure 9.1.3-1: Paks Nuclear Power Plant and region in Paks city regulation plan [9.1-4]

Pursuant to the Zoning Ordinance of the Municipality of Paks, the premises of Paks Nuclear Power Plant and the areas designated for the construction of the new units and adjacent facilities are located within an economic-industrial building zone (Gip) to be used for the purpose of the generation of nuclear energy. More specifically, the planned power plant, part of the mobilisation area, the North-Eastern part of the mobilisation area and the area enclosed by the cold water channel and the hot water channel belong to building zones Gip - M 1.1, Gip - M 1.3, Gip - M 3 and Gip - M 1.2, respectively.

Article 28/E of HÉSz describes the requirements concerning building zones Gip - M" in detail, which are as follows:

(1) The building zone comprises the premises of the nuclear power plant and of the Interim Spent Fuel Storage Facility (ISFS).

(2) The following activities may be pursued in the area: electricity generation during the permitted operation, the interim storage of fuel spent during the permitted operation in Paks Nuclear Power Plant, exclusively, and activities preceding and related to the preparation of the construction of the planned new units of the power plant. The length of the period of storage may not exceed 50 years calculated from the date of commissioning of the first storage module.

(3) Plot restructuring requirements and site coverage limits to be observed on the plots within the individual building zones:

Zone code	Defined purpose	Way of development	Minimum plot size	Maximum site coverage	Maximum height of buildings	Minimum green area
		(place of building)	[m²]	[%]	[m]	[%]
Gip-M1	Power plant	estab./ freestand.	K	50	K	25
Gip-M2	ISFS	estab./ freestand.	K	50	K	25
Gip-M3	Power plant – Reserve area	SZTK (according to the zoning plan to be prepared)				

Figure 9.1.3-1: Requirements for building zone Gip-M in the Zoning Ordinance of the City of Paks

(4) The Zoning Plan defines some subzones within building zone Gip-M1.

(5) Plot restructuring requirements and site coverage limits to be observed on the plots within the subzones in building zone Gip-M1 besides the zoning regulations applicable to zone Gip-M1 as a whole:

Subzone code	Defined purpose	Way of development	Minimum plot size	Maximum site coverage	Maximum height of buildings	Minimum green area
		(place of building)	[m²]	[%]	[m]	[%]
Gip-M1.1	Industrial area	estab./ freestand.	K	40	K	40
Gip-M1.2	Industrial area	estab./ freestand.	K	60	K	10
Gip-M1.3	Industrial area	estab./ freestand.	K	30	K	50
Gip-M1.4	Transport area	estab./ freestand.	K	10	K	40

Figure 9.1.3-2: Requirements for the subzones of building zone Gip-M in the Zoning Ordinance of the City of Paks

(6) Any and all plot development and construction activities pursued in the area must be in accordance with the relevant separate legal rules.

(7) The structures to be built in the building zone must be related to the activity specified in Section (2) and necessary for the operation of the existing 4 units or the interim storage of the fuel spent during the permitted operation of these units.

(8) The reserve industrial area of the power plant must be handled, recorded and cultivated separately from the developed industrial area.

As Article 28/E, Section (2) of the HÉSZ does not clearly specify the places where the new units could be built and Section (7) mentions the operation of the existing 4 units, the construction of the new units requires the amendment of the HÉSZ.

9.1.4 PAKS LONG TERM CITY DEVELOPMENT CONCEPT– SETTLEMENT STRUCTURAL PLAN

The Municipality of the City of Paks appointed Pécsi Építész Kör Építész- és Településtervező Kft to revise the urban development concept which had been elaborated in 2009-2010 by the Transdanubian Regional Institute of the Centre for Regional Researches of the Hungarian Academy of Sciences and adopted by ordinance No. 55/2010. (V. 26.). The Municipality of the City of Paks adopted the documentation titled “Zoning Plans of the city of Paks, Settlement Structure Plan and Description” by ordinance No. 79/2011. (XI. 23.).

The Settlement Structure Plan and Description contains the following information concerning the planned development:

1. Partial purpose of development: Qualitative intensification of residential areas

The expansion of the nuclear power plan is not expected to increase the population significantly, therefore it would not create a need for the designation of new and larger residential areas.

2. Partial purpose of development: Industrial areas

The (eventual) planned expansion of the nuclear power plant can be realized within the current premises of the power plant. The consequences to be drawn in the environmental impact study appropriate for the new capacities concerning urban planning will need to be incorporated in the zoning plan.

1. THE PRIORITY TASKS AND THE CONCEPT OF URBAN DEVELOPMENT

The life and future of the city of Paks is closely related to the Nuclear Power Plant. The extension of the lifetime and the expansion of the power plant are on the agenda and the preparations have commenced. As stated in the urban development concept, the expansion is not expected to bring about any significant change in the development of the town. A well-balanced, natural growth of a minor extent can be anticipated, which can take place in the framework provided by the current plan.

The capacity enhancement of the power plant may give rise to changes primarily in the field of the development of the economy, particularly in respect of the Industrial Park of Paks and the adjacent "reserve" industrial areas.

The major fields of urban development are aimed at issues related to the continued construction of urban infrastructure systems (road and public utility networks) and qualitative development (increasing comfort levels).

The core issues discussed in the plan (requiring systematic consideration) are as follows: development of the transport network, major decisions concerning the use of land and urban planning with an ecological approach, in accordance with the principle of sustainable development.

1.2 The spatial demands of urban development

As for industrial-economic areas, the primary development which can be anticipated is the continued development of the Industrial Park according to plans. The development areas necessary for other industrial activities of the power plant according to previous plans are contained in the plan.

1.3 Promoting the balance between the natural and urban environments

The most important task in the region of Paks is to restore the former conditions of the two significant ecological formations (the Danube region and the Southern Mezőföld region). The connections between the “lines of force” of the

natural elements directly bordering on the area within the city limits must be revived, if necessary. To this end, the forestation of the areas on the southern side of the Nuclear Power Plant must be promoted primarily.

2. SETTLEMENT STRUCTURE – LAND USE

2.1 SETTLEMENT STRUCTURE

THE NUCLEAR POWER PLANT

After the radical phase of the development of the town (1970-1985), the use of land could be regarded as established in the region of the power plant.

The premises of the power plant are located within the city limits and qualify as land used for industrial purposes.

As for the transport system of the area of the power plant, the current northern and southern gates will be completed with the possibility to approach the power plant from the north, next to the railway lines.

4. NETWORKS OF INRASTRUCTURE

4.1 Transport

Road transport

One of the main purposes of developing the urban transport network is to ensure that the national road network runs outside the central part of the town.

The planned construction of a connecting road between the Kölesdi road junction of motorway M6 and the junction of the northern access road of the Nuclear Power Plant with main road No. 6 will be of regional importance. This connecting road is intended to create direct connection between motorway M6 and main road No. 6 in the southern direction, bypassing the territories within city limits, and to make the Nuclear Power Plant directly accessible from the motorway and vice versa. (Road category: K.V.B.)

The premises of the Paks Nuclear Power Plant and the ISFS, as well as the reserve industrial areas located in the north within the safety zone continue being listed to the economic-industrial (Gip) building zone in the Settlement Structure Plan.

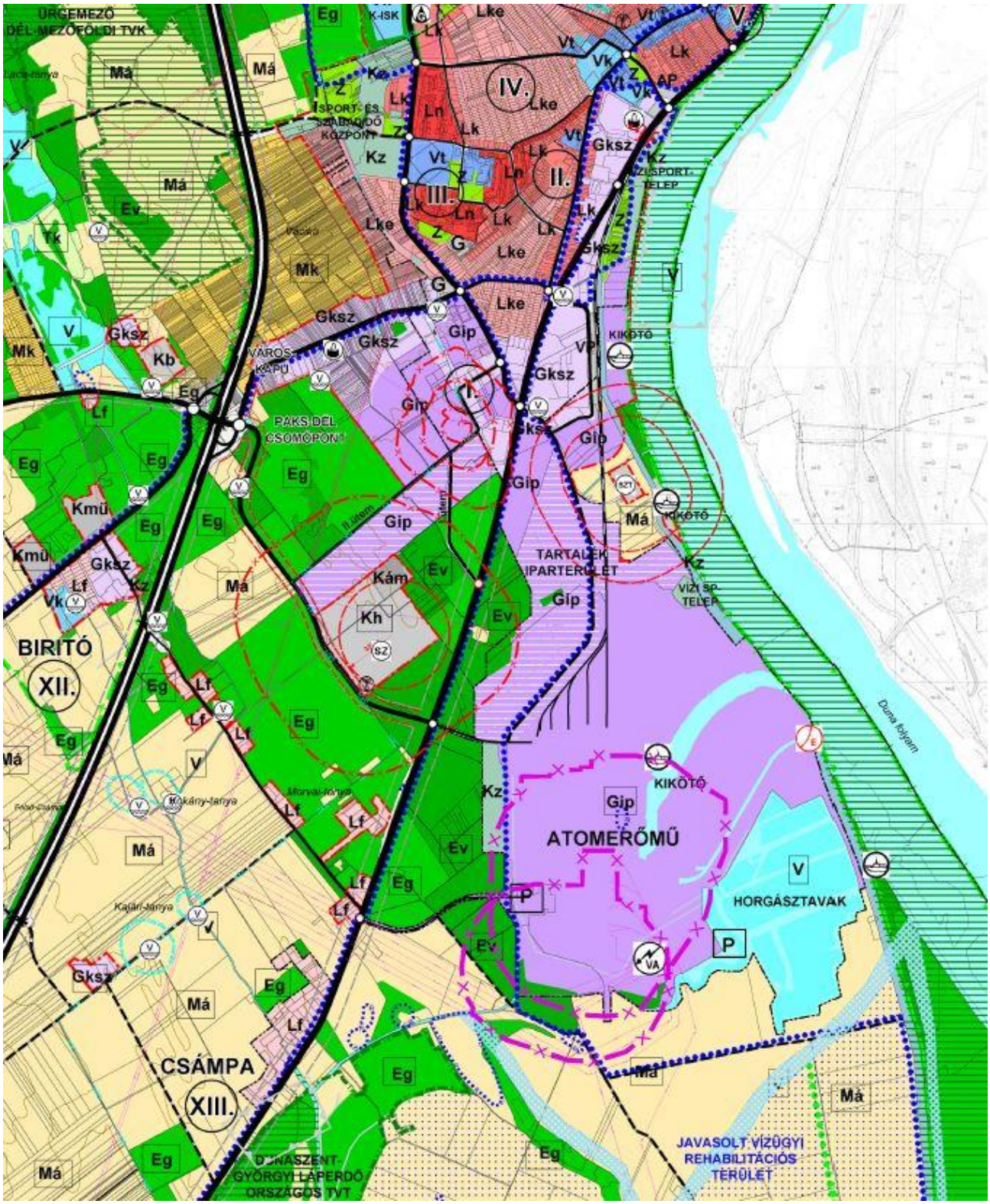
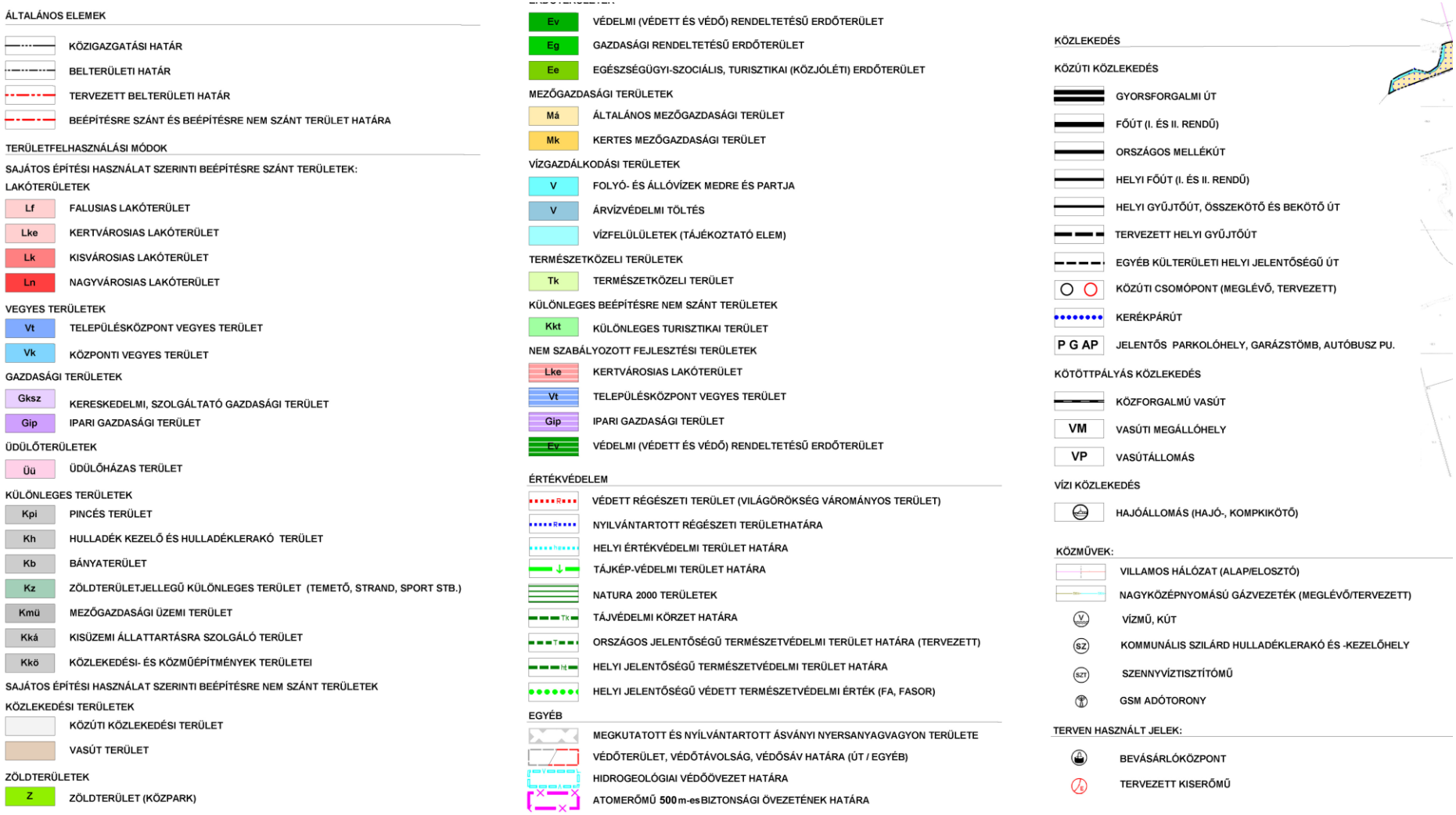


Figure 9.1.4-1: Paks Nuclear Power Plant and region in Paks city settlement structural plan [9.1-5]

Paks város település szerkezeti terv – Paks city settlement structural plan - legend



Általános elemek – General elements
Közigazgatási határ – Public administration boundary
Belterületi határ – Inner area boundary
Tervezett belterületi határ – Planned inner area boundary
Beépítésre szánt és beépítésre nem szánt terület határa – Boundary of area planned and not planned for building
területfelhasználási módok – land use methods
Sajátos építési használat szerinti beépítésre szánt területek – Areas to be built in for special purpose
lakóterületek – residential area
falusias lakóterület – village type residential area
kertvárosias lakóterület – suburban residential area (with gardens)
kisvárosias lakóterület – small city-type residential area
nagyvárosias lakóterület –large city-type residential area
vegyes területek – mixed areas
településközpont vegyes terület – mixed areas in city centre
központi vegyes terület – central mixed area
gazdasági területek – economic business area
kereskedelmi, szolgáltató gazdasági terület –commercial/service area
ipari gazdasági terület – industrial area
üdülőterületek – resort area
üdülőházas terület – area with resort facilities
különleges területek – special areas
pincés terület – area with cellars
hulladék kezelő és hulladék lerakó terület – waste depository and treatment area
bányaterület – mining area
zöldterület jellegű különleges terület (temető, strand, sport, stb.) – special green area (cemetery, beach, sports, etc.)
mezőgazdasági üzemi terület – agricultural (farm) area
kisüzemi állattartásra szolgáló terület –small scale husbandry area
közlekedési és közműépítmények területei – traffic and public utility area
sajátos építési használat szerinti beépítésre nem szánt területek – areas not to be built in for special purpose
közlekedési területek – traffic area
közúti közlekedési terület – road traffic area
vasút terület – railway area
zöldterületek – green areas
zöldterület (közpark) – green area (park)
védelmi (védett és védő) rendeltetésű erdőterület – protected forest area (protective and protecting)
gazdasági rendeltetésű erdőterület – forest with economic purposes
egészsgügyi, szociális, turisztikai (közjóléti) erdőterület – health, social, touristic forest area
mezőgazdasági területek – agricultural areas
általános mezőgazdasági terület – general agricultural area
kertes mezőgazdasági terület – agricultuiral area with gardens
vízgazdálkodási területek – water management areas
folyó és állóvizek medre és partja – banks and neds of rivers and lakes
árvízvédelmi töltés – flood protection dam
vízfelületek (tájékoztató elem) – water surfaces (informative element)
természetközeli területek – nature-like areas
természetközeli terület – nature-like area
különleges beépítésre nem szánt területek – area not planned for special buildings
különleges turisztikai terület – special touristic area
nem szabályozott fejlesztési területek – un-regulated development areas
kertvárosias lakóterület – suburban residential area (with garden)
településközpont vegyes terület – mixed areas in city centre
ipari gazdasági terület – Industrial/commercial area
védett régészeti terület (világörökség várományos terület) – protected archaeological area (area expected to be nominated to be part of the world heritage designation)
nyilvántartott régészeti terület határa – border of registered archaeological area
helyi értékvédelmi terület határa – border of local protected area
tájkép-védelmi terület határa – border of protected landscape area
Natura 2000 területek – Natura 2000 areas
tájvédelmi körzet határa – border of protected landscape zone
országos jelentőségű tájvédelmi körzet határa (tervezett) – border of national protected area
helyi jelentőségű tájvédelmi körzet határa – border of local protected area
helyi jelentőségű védett természetvédelmi érték (fa, fasor) – nature conservation of local value (trees, tree alleys)
megkutatott és nyilvántartott ásványi nyersanyagvagyon területe – explored and registered mineral resources
védőterület, védőtávolság, védősáv határa (út/egyéb) – protected area, zone, distance
hidrogeológiai védőövezet határa – border of hydrology zone
atomerőmű 500 m-es biztonsági övezetének határa – 500 m safety zone for nuclear power plant
közlekedés – traffic
közúti közlekedés – road traffic
gyorsforgalmi út – speedway
főút – main road
országos mellékút– national secondary road
helyi főút (I. és II. rendű) – local main road
helyi főút – local main road
helyi gyűjtőút, összekötő és bekötőút – local feeder and access road
tervezett helyi gyűjtőút –planned local feeder road
egyéb külterületi helyi jelentőségű út – other road of local importance
közúti csomópont (meglévő, tervezett) – road junction (existing, planned)
kerékpárút – bycicle road
jelentős parkolóhely, garázstömb, autóbusz pu. – major parking place, garage, bus station
kötöttpályás közlekedés – track-based transport
közforgalmú vasút – public railway
vasúti megállóhely – railway stop
vasútállomás – railway station
víziközlekedés – water traffic
hajóállomás, (hajó, kompkikötő) – port/quay (ship, ferry
közművek – public utilities
villamos hálózat alap/elosztó – electricity grid (base distribution grid
nagyközépnyomású gázvezeték meglévő, tervezett – Mid-pressure gas network (existing, planned
vízmű, kút – water work, well
kommunális, szilárd hulladéklerakó és kezelőhely – Communal solid waste depository and treatment plant
szennyvíztisztítómű – waste water treatment plant
GSM adótorony – GSM transmission tower
terven használt jelek – signs used on the plans
bevásárlóközpont – shopping plaza
tervezett kiserőmű – planned small power plant

Figure 9.1.4-2: Paks Nuclear Power Plant and region Paks city settlement structural plan - legend [9.1-5]

9.2 ECONOMIC PROFILE OF THE REGION WITHIN A 30 KM RADIUS

There is hardly any change in the economic ranking of the regions versus the former period. The level of economic development of the regions is strongly differentiated. In South-Transdanubia the per capita gross domestic product (GDP) is 71.3 % of the national average, occupying the fourth position among the regions. The South-Great Plain region is the fifth. During the past years Tolna county could produce a significant improvement in the list as it climbed form the 14th position in 2007 and the 7th in 2010. There was no change in Bács-Kiskun county, it keeps on occupying the 14th position.

Regarding the performance of the economy it is quite characteristic that agriculture in Tolna county delivered 12.2% of the gross added value still in 2008, 3-times higher than the national average figure.

Funds from the European Union Structural Funds between 2007 and 2013 may energize the economy and support the retarded regions to catch-up and eliminate backlog in infrastructure.

9.2.1 INDUSTRY

9.2.1.1 Tolna county - characteristic economic indicators

In Tolna county the per capita GDP is HUF 2,039,000, representing 76% of the national average figure.

Industrial production represents 1.4% of the country's industrial production. When evaluating the industry we should definitely emphasise the role of Paks Nuclear Power Plant, because the Plant produces nearly half of the county's industrial production. Disregarding the electricity industry, the food industry is the second main sector. The county's engine is still export, strengthening the processing industry.

During the past year the labour market profile has deteriorated in Tolna county. Employment rate has declined, unemployment rate has increased and the number of economically inactive people has grown in the 15–74 population. Agriculture, forest management and fishing suffered the highest loss in headcount.

The monthly gross average wage of full-time employees was 189 400 forint, representing 5.3 % increase versus the previous year figure. The net average monthly wage was 122 600 forint.

The number of registered job seeking people declined by 10 % in the county.

The value of the projects performance decreased in most branches of the national economy – in 10 out of 19 – during one year. Regarding the most important investor in the county, the value of developments in the energy industry decreased by nearly 50%, whereas the value of processing industry projects nearly doubled and new developments in the agriculture could also significantly expand (by 21%). However, regarding the sector composition the energy industry was still far the greatest investor.

Volume of industrial production also increased by 7.1 % within one year.

Emission of energy industry (producer of nearly two-third of the production value) increased by 7.8 %, and that of the processing industry (producer of further 355 of the industrial production) increased by 9.6% within one year. Dynamic developments in both domestic and international market demand could contribute to the growth of the latter mentioned industry.

Production and sale generated the highest income for the county's processing industry (its share in total sales was 35–35 %) and it could deliver a robust growth (9.5%) as a result of producing food, drink/beverage and tobacco products, as domestic sale could be intensified. The second sector was production of textiles, garments, clothing, leather and leather products, representing 33% of export sale, and it could also grow significantly (14 %). Production of electric equipment could also grow faster (10.4 %) than the average rate, as the third largest sector in the county's processing industry, representing nearly 275 of export sale. Reasons behind growth we can find, in addition to 8% increase in export, also dynamic development in domestic demand, and we can see some decline only in the fields of metallurgy raw material and metal procession production.

Production volume of the building industry – following the dynamism in 2011 – significantly declined this year (24 %). Performance has dropped also on national level, though the degree of decline was significantly lower (12%) than in Tolna county.

9.2.1.2 Bács-Kiskun county - characteristic economic indicators

The per capita GDP was HUF 1.707.000, representing 64% of the national average.

Industrial production represents 3.2% of the country's industrial production.

The labour market profile has improved, but the employment rate is lower than the national average. Monthly gross average wages were 7% higher, but in real term wages decreased by 4% due to changes in the taxation regime and increasing consumer prices.

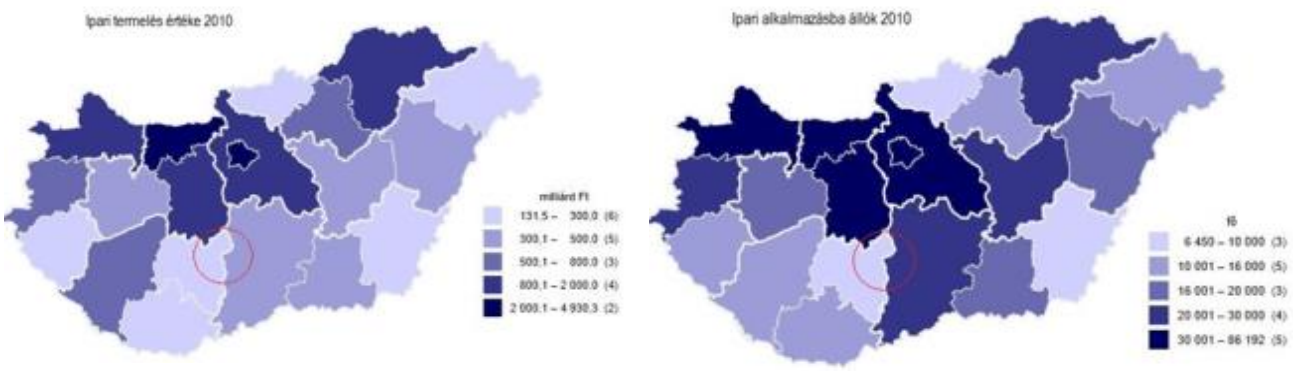
Industry delivered a good performance versus the past period. Production volume of the plants in the county increased by 11%, and those having registered seat in Bács-Kiskun county by 14%. Companies operating in the building industry found themselves in difficult position, their production volume was only 60% of the former volume. Though the residential building sector could grow by a few %, but it was unable to compensate the significant decline that occurred in the 1st quarter last year.

The county's employment profile improved last year. In 2012 1st quarter the number of people in employment was 191 000 in the 15–74 age group population as shown in the KSH labour market survey, which was 3 000 more than in the same period a year ago. The number of unemployed was 2 000 lower, while their number increased on national level. The unemployment rate was better than the national average.

Monthly gross average wage of full-time employees was 174 000 forint, nearly 7 % higher than a year ago, and represented almost 80% of the national average. Wages increased the most in the competitive sector, primarily in blue-collar jobs with a rate nearly 13 %. This growth could be seen in almost every sector in the economy, but wage in arts and leisure time sectors increased with the highest rate, their wage was in monthly average gross 187 000 forint, 20% higher than a year ago.

Share of individual private undertakings was significantly higher than the national average, 72% of the registered businesses belong into this category. The reason of difference was hidden in the specific economic structure of the region, as it is primarily agricultural activity. In this sector most of the business organisations functions as a private undertaking, but share of private businesses is higher also in other sectors in Bács-Kiskun county than in the national average.

Decline in investments was the strongest in Bács-Kiskun county: the per capita investment was nearly 32 000 forint, lower than two-thirds of the national average. This was primarily because the Mercedes project was completed and thus amounts invested into the vehicle industry significantly dropped.



Legend:
Ipari termelés értéke – value of industrial production
milliard Ft – HUF bn

Ipari alkalmazásba állók – Number of people employed by industry
fő – headcount

Figure 9.2.1-1: Value of industrial production and employment data – 2010

9.2.2 AGRICULTURE

Agricultural parameters of the area (cut into two regions by Danube river) are significantly different, and the totally different conditions in soil structure, soil quality and weather conditions can be clearly reflected also in the production parameters, Golden Crown (unit used for land valuation in Hungary) for arable lands.

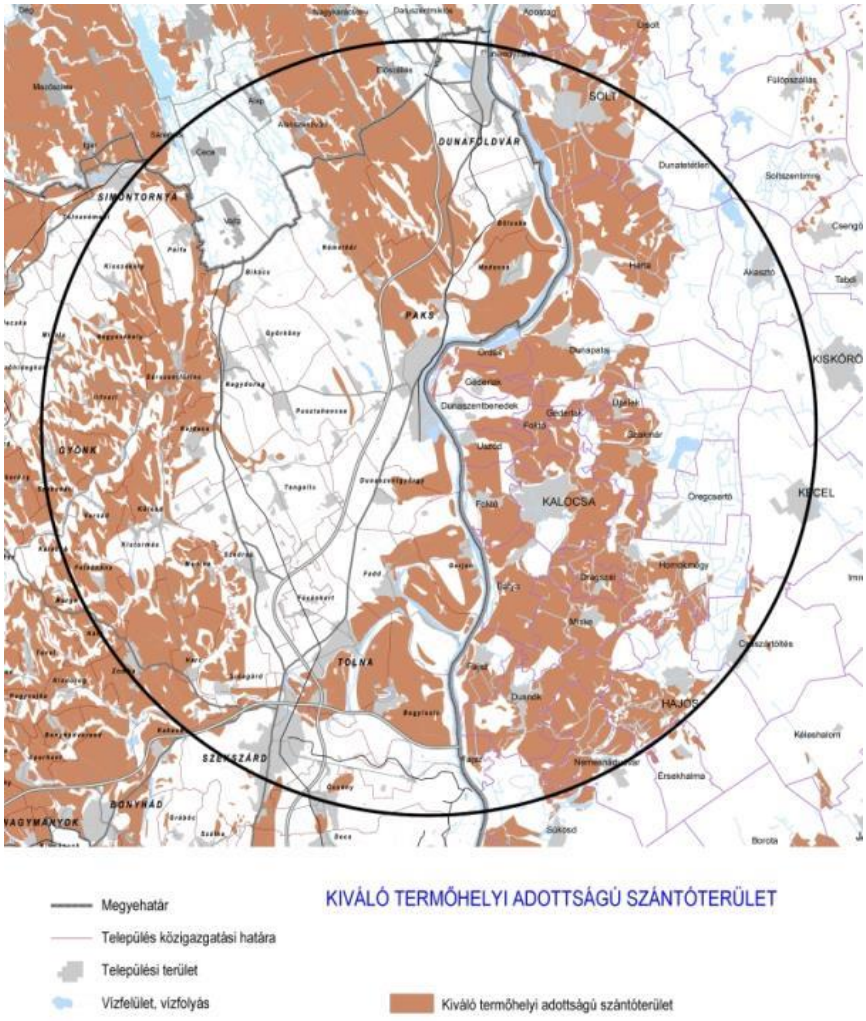
9.2.2.1 Requirements of the agricultural region in the county settlement plans

As described in the OTrT, the agricultural region is a land use category that also includes areas that are primarily under agricultural cultivation. According to the Plan, the agricultural land use category includes those coherent regions, where agricultural production would remain dominant also on longer term and share of forest areas remains below 10-15 % during this time horizon.

The study area contains a significant size arable land with excellent production capacity, as defined by the OTrT. Agriculture will continue having a dominant role in the regional landscape management, thus good quality lands should be protected also using means of rural settlement. Opportunities for developing family and large-scale farming should be secured. Lands fragmentation shall be prevented using good quality lands for purposes other than cultivation, and use of agricultural farms for purposes other than agriculture. Fruit production, lawns and – in this context - livestock farming shall be incentivised in lands that are not so good for plant cultivation. Environmentally-friendly bio-cultivation shall be also incentivised, as this county has excellent parameters in this respect.

In vine producing regions the primarily I. class vineyard cadastre lands should be incentivised for viniculture and development of the so-called wine tourism.

9.2.2.2 Arable lands with excellent production capacity



Legend:
Megyehatár – county boundary
Település közigazgatási határa – settlement administrative border
Települési terület – settlement area
Vízfelület, vízfolyás – water surface, water flow
Kiváló termőhelyi adottságú szántóterület – Arable land zone with excellent production capacity

Figure 9.2.2-1: Arable land zone with excellent production capacity

We can see different parameters also in land use, while the region in Tolna county has the best and largest areas for agricultural cultivation, this is lower than the national average on the left bank of Danube river.

Settlement	Arable Land	Kitchen Garden	Vine		Orchard		Grass	Agricultural Land	Forest	Reeds	Fishpond	Cultivated Area
			Area	Cultivated Area	Area	Cultivated Area						
	Number of users											
Baja micro-region	**274**	**493**	**223**	**223**	**36**	**34**	**58**	**653**	**81**	**82**	**6**	**663**
Nemesnádudvar	49	144	111	111	10	9	18	214	42	42	1	219
Sükösd	225	349	112	112	26	25	40	439	39	40	5	444
Kalocsa micro-region	**3 049**	**2 023**	**915**	**890**	**281**	**253**	**349**	**4 239**	**261**	**255**	**25**	**4 283**
Bátya	247	22	2	2	6	6	2	253	3	3	–	254
Drágszél	35	27	–	–	2	2	5	42	–	–	–	42
Dunapataj	232	116	84	82	24	19	25	304	51	50	2	309
Dunaszentbenedek	77	59	36	32	5	4	18	130	14	14	1	134
Dunatetétlen	82	78	4	4	6	5	19	105	1	1	1	105
Dusnok	212	139	47	45	2	2	10	296	12	12	1	300
Fajsz	206	35	–	–	8	8	–	218	7	7	–	219
Foktő	97	35	13	13	7	7	4	123	5	5	–	125
Géderlak	54	16	2	2	1	1	3	56	1	1	–	56
Hajós	148	307	345	342	23	21	26	457	62	61	3	464
Harta	137	128	44	34	38	29	20	227	6	5	1	228
Homokmégy	162	183	30	30	7	7	26	260	3	3	2	261
Kalocsa	271	120	38	35	30	25	36	334	10	8	2	335
Miske	115	83	2	2	5	5	5	135	9	9	5	136
Ordas	48	40	4	4	–	–	–	57	1	1	–	57
Öregcsertő	97	111	3	3	6	6	20	142	3	3	–	142
Solt	537	252	237	236	100	97	69	730	61	60	3	745
Szakmár	117	142	18	18	6	4	30	166	7	7	2	166
Újtelek	81	68	–	–	1	1	19	94	–	–	1	94
Uszód	94	62	6	6	4	4	12	110	5	5	1	111
Kiskőrös micro-region	**2 366**	**1 523**	**2 310**	**2 221**	**940**	**873**	**642**	**4 120**	**427**	**427**	**38**	**4 173**
Akasztó	358	331	241	220	19	15	64	606	23	24	7	611
Császártöltés	92	172	146	146	3	3	35	239	53	53	–	247
Kecel	873	525	822	805	636	591	210	1 455	251	250	14	1 474
Kiskőrös	1 043	495	1 101	1 050	282	264	333	1 820	100	100	17	1 841
Kunszentmiklós micro-	**32**	**12**	**10**	**10**	**3**	**3**	**5**	**42**	**1**	**–**	**–**	**42**
Dunaegyháza	32	12	10	10	3	3	5	42	1	–	–	42
Dunaújváros micro-region	**932**	**742**	**134**	**134**	**14**	**9**	**32**	**1 160**	**89**	**90**	**0**	**1 173**
Daruszentmiklós	329	274	89	89	3	3	2	376	75	75	–	389
Előszállás	407	197	43	43	6	4	24	478	12	12	–	478
Nagykarácsony	196	271	2	2	5	2	6	306	2	3	–	306
Sárbogárd micro-region	**865**	**814**	**134**	**132**	**32**	**31**	**152**	**1 089**	**64**	**62**	**9**	**1 094**
Alap	328	284	23	23	1	1	58	399	6	6	1	401
Alsószentiván	65	62	17	17	4	4	23	83	16	15	–	85
Cece	260	242	27	25	12	11	55	329	26	25	3	329
Sáregres	105	129	22	22	9	9	4	144	3	3	1	145
Vajta	107	97	45	45	6	6	12	134	13	13	4	134
Paks micro-region	**2 230**	**2 489**	**1 659**	**1 649**	**619**	**596**	**332**	**4 133**	**710**	**708**	**17**	**4 219**
Bikács	21	32	8	8	2	2	4	46	1	1	–	46
Bölcske	178	258	258	257	104	97	30	438	151	150	2	451
Dunaföldvár	524	418	465	461	266	254	58	889	134	134	7	900
Dunaszentgyörgy	101	83	53	53	7	7	16	168	14	14	–	170
Gerjen	76	80	13	13	4	4	7	115	7	6	–	116
Györköny	47	65	59	59	8	8	14	116	28	28	–	119
Kajdacs	115	155	12	11	6	5	12	174	14	14	–	174
Madocsa	135	240	135	134	53	53	14	307	103	103	–	317

Settlement	Arable Land	Kitchen Garden	Vine		Orchard		Grass	Agricultural Land	Forest	Reeds	Fishpond	Cultivated Area
			Area	Cultivated Area	Area	Cultivated Area						
	Number of users											
Nagydorog	193	202	105	103	12	11	41	290	54	54	2	293
Németkér	135	119	60	60	14	14	15	223	56	56	–	235
Paks	292	385	362	362	121	121	67	750	106	106	5	779
Pálfa	247	257	76	75	12	10	12	348	13	13	–	348
Pusztahencse	80	68	13	13	2	2	30	120	16	16	1	121
Sárszentlőrinc	86	127	40	40	8	8	12	149	13	13	–	150
Szekszárd micro-region	**2 159**	**2 348**	**2 054**	**2 028**	**567**	**528**	**274**	**4 459**	**463**	**447**	**24**	**4 515**
Bogyiszló	176	190	35	35	5	5	13	291	10	7	–	292
Fácánkert	37	49	10	10	2	2	1	63	1	1	–	63
Fadd	154	231	45	45	22	22	6	313	18	17	1	314
Felsőnána	64	50	16	16	8	8	11	83	9	9	–	83
Harc	67	56	45	45	4	3	7	95	7	7	1	95
Kéty	93	100	39	39	4	3	16	118	23	23	–	118
Kistormás	46	34	7	7	1	1	2	52	1	–	–	52
Kölesd	97	133	89	89	16	16	20	189	67	67	–	194
Medina	78	58	59	58	8	8	21	116	35	35	–	119
Őcsény	109	59	36	36	8	8	3	153	10	10	3	156
Sióagárd	143	167	115	115	26	26	22	206	12	12	2	208
Szedres	129	114	33	33	8	6	10	169	26	26	2	170
Szekszárd	295	478	1 256	1 232	387	354	77	1 529	105	97	10	1 549
Tengelic	237	341	84	83	29	28	24	461	80	79	2	476
Tolna	212	102	113	113	26	25	19	336	19	19	2	339
Zomba	222	186	72	72	13	13	22	285	40	38	1	287
Tamási micro-region	**577**	**694**	**427**	**427**	**108**	**102**	**137**	**1 079**	**189**	**186**	**15**	**1 102**
Gyönk	110	111	103	103	28	27	27	215	65	64	–	225
Kalaznó	14	13	–	–	2	1	5	19	3	3	–	20
Kisszékely	24	27	19	19	3	3	6	41	7	6	1	42
Miszla	56	58	14	14	5	2	7	87	29	29	2	89
Nagyszékely	48	44	18	18	5	5	11	59	16	16	2	59
Simontornya	148	252	209	209	44	43	51	427	24	24	5	432
Szakadát	9	20	6	6	2	2	6	26	10	10	–	26
Tolnanémedi	92	99	28	28	12	12	7	117	7	7	1	118
Udvari	55	56	24	24	5	5	12	65	22	22	1	66
Varsád	21	14	6	6	2	2	5	23	6	5	3	25
In total	24 968	22 276	15 732	15 428	5 200	4 858	3 962	41 948	4 570	4 514	268	42 528

Table 9.2.2-1: Number of land users broken down to cultivation [9.2-1]

9.2.2.3 Agriculture in areas that belong to Tolna county

This is a traditionally agricultural area producing feedstock for the country's food economy. The geographic parameters are variable, 43% of the area is plain-type, like in the Great Plain, while 57 %- has variable land surface with higher location with hilly character. Natural parameters are favourable for agricultural and horticultural production. The number of hours of sunshine is in average higher than 2000 and the average annual mean temperature is around the national average.

We can describe three agricultural landscape zone sin the area of study:

1. Sárköz-Danube-valley plain land

Share of arable land is here the highest. Grain, cereals, industrial plants, potato, vegetable (paprika), intensive grape production are characteristic for this landscape zone.

2. Mezőföld

The Golden Crown value of arable land is here the lowest in the county, however share of arable land is still high. Mainly cereals, industrial and fodder plants are produced, de vegetable, fruit and (sand-type) grape production is also quite significant. Regarding livestock farming pig breeding is the most characteristic.

3. Völgység-Hegyhát

This is the extreme west part of the study area. The Golden Crown value of land is here the lowest. There are few arable lands, de rate of lawn (meadow, pasture) is high. Production of grain, cereals industrial and fodder plant production, and, based on this, domestic cattle and pig breeding is the dominant.

This study area contains the Szekszárd vine-producing region (classified as historic viniculture zone) and Tolna vine-producing, also qualified as excellent based on ecological parameters. In these regions vine producing activities are performed at nearly 5,000 ha at present.

Grape, fruit, horticulture was for centuries the most characteristic to Tolna county. Vineyards were organic parts of most villages. This feature has been, most unfortunately, disappearing in recent years, and in settlements except the vine-producing areas viniculture was practically abandoned in villages located beyond the wine-producing regions, and we can find orchards also only sporadically. Between 2004-2010 the vine-production lands declined by 1000 ha, i.e. 27 % in the Tolna vine region. At Szekszárd vine region the situation is even more unfavourable, as the decline rate was 29% during the same period. (the national average decline rate was 13 %.)

Share of agricultural area and, within that, arable land in the county's total land area is much higher than the national average, and this figure further increased due to abandoned orchards and brining lawn areas under agricultural cultivation. But this process is unfavourable and deteriorates also the agricultural production conditions: we have less land-protection forest lines, and this can make wind erosion impact more powerful and has unfavourable impacts also on the micro-climate.

The county's livestock farming was significant even in national context. During past years profitability of this sector significantly deteriorated (due to higher fodder and energy prices) and farmers rather abandon livestock farming, number of livestock and production of animal products also declined.

9.2.2.4 Agriculture in areas that belong to Bács-Kiskun county

The county's share in the country's agricultural production and product sale is higher than the share of its area. As a result of favourable parameters the county has a particularly outstanding role in the country's grape, fruit and vegetable production.

Bács-Kiskun county has three characteristic regions: Danube-valley plain, Danube-Tisza plain and Bácska plain. The eastern section of the study area belongs to the Danube-valley plain, which is an agricultural region.

Most parts of the Danube-valley plain are medium-consolidated alluvial soil with good production capacity, where all arable land-type plants can be produced. On the eastern side of the region there are major plots of saline areas with

unfavourable parameter for plant production. The annual precipitation is between 540-670 mm, and the annual average number of hours of sunshine is 1440-1490 hours. The most characteristic plants in the region are the spice paprika and green pepper.

The sowing culture in arable lands in plants produced in so-called large scale farming (wheat, corn, sunflower, barley) is quite similar to the national sowing structure.

Fruit and grape production is also quite significant in the county, vineyards belong to the Danube wine region (Hajós-Baja and Kunsági).

9.2.3 WATER USE

The concept of water management includes the water use, preservation of utilisation options, protection against water damage (i.e. water damage prevention) in accordance with the provisions in Act LVII of 1995. This concept has been significantly expanded in the past decades with environmental protection and nature conservation criteria. It has a pre-eminent role in the protection of drinking water bases, ensuring drinking water supply for population in perfect quality and also appropriate waste water drainage.

Water management complexity also includes that Danube Strategy sets out among its objectives related to developments in water management that flood risk factors should be mitigated by 25 % and 80% of running water should be made suitable for bathing by 2020. There is no specifically allocated fund for implementing the plans, thus this strategy shall be implemented by more efficient utilisation and better management of the existing financing system.

Water beds settlement and regulation, protection against floods and inland inundation and water damage prevention are the key tasks to be performed in the study area.

During the past decade the number of periods with exposure to flood and inland inundation risk has significantly increased, flood water levels have also increased, and inland inundation can now also hit new areas. Nevertheless, dry periods have also become longer, when there is no or very little precipitation in certain areas.

One of the most critical actions to be taken is acclimatisation to the extreme weather conditions caused by climatic change and efficient and timely preparation for water damages and water shortage, and to mitigate the damages. Appropriate water reserve management can include not only securing proper water supply for the economic and business areas, but also distribution and allocation of waters and securing supply for demands of various sectors (e.g. nature conservation, environmental protection, welfare, etc.).

9.2.3.1 Requirements of water management region in the county settlement plans

A water management region as defined by OTrT: „category of land use determined in the national, high-priority regional and county spatial development plan, which includes the bed and embankment of certain running waters, standing waters, waterways and channels." The OTrT does not prescribe any lower limit value in dimension or size for designating a water management region, thus in theory every water surface can be classified into this regional land use category.

There are two priorities proposed for simultaneous application for land use related to running waters and embankment areas and their utilisation:

- safe drainage of flood waters (life and property protection)
- and water retention (to secure supply of water for ecological and touristic purposes, to reduce flood peak).

The rainwater drainage plan should be best prepared as part of the settlement plan of the given city/village. This plan can delineate areas for closed drainage and open-ditch water drainage. It would be also useful to define the long term load factor for water catchment.

9.2.3.2 Surface waters

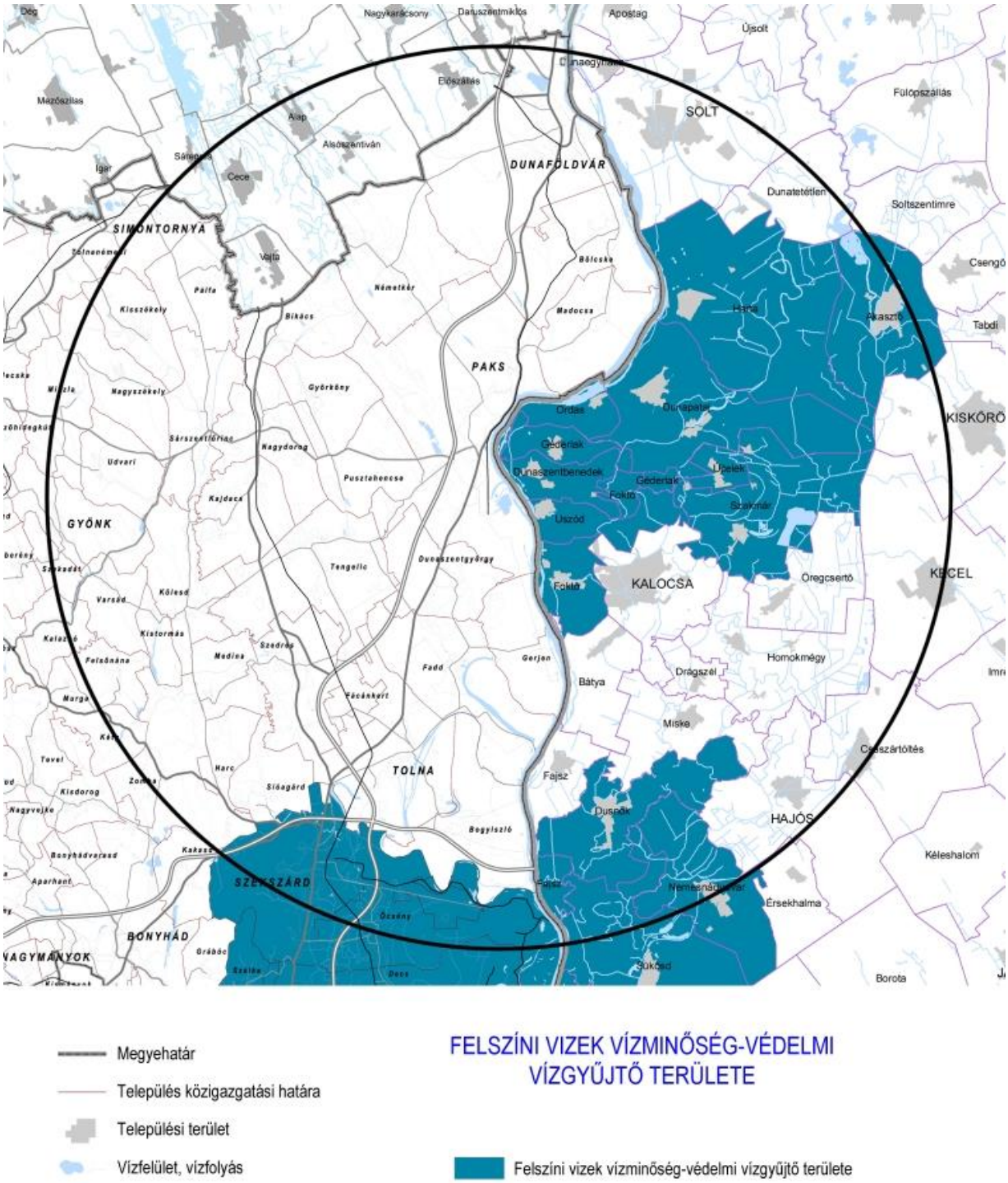
The Water Directive (VKI) is the fundamental legislation of the European Union regarding water management, and it entered into effect in 2000. Implementation of tasks and actions prescribe din the Directive are obligatory also for Hungary as the country joined the European Union. The purpose of VKI is to ensure that all surface and underground water bodies can be in „good condition" and this status can be sustainable also on long term by 2015 (if so justified, by

2027). A good ecological status means that human impacts cannot disturb the life of natural habitats and the volume of water is also satisfactory. In case of good chemical status the concentration of polluting materials is lower than the limit defined by the relevant ecological criteria.

However interventions required for reaching the good status can also harmonise the plans or concepts for flood and inland inundation protection and settlement development (e.g. waste water treatment, drinking water supply).

Thus the county's spatial development plans defined the water management region and channels of regional significance. The water catchment management plans delineated the water bodies with regional significance (standing waters, running waters) and channels that represent waters with water catchment area greater than 10 km^2 in accordance with the guidelines set out in the VKI.

As prescribed for zoning by OTrT, "Actions shall be taken in order to ensure inflow and outflow (drainage) of waste waters into and from the water catchment area produced in the water catchment area of surface waters sensitive to pollution and beyond the water catchment area in the high-priority regional and county-level spatial development plan", thus the county settlement plans can also delineate the water catchment area for surface waters quality protection.



Legend:
Felszíni vizek vízminőség-védelmi vízgyűjtő területe – surface waters water quality protection water catchment area zone
Megyehatár – county boundary
Település közigazgatási határa – settlement administrative border
Települési terület – settlement area
Vízfelület, vízfolyás – water surface, water flow

Figure 9.2.3-1: Surface waters water quality protection in the water catchment area zone

Among waters presented in the study area the most significant are: Danube, Kapos, Sió, Nádor-canal (Sárvíz). Most of the above mentioned water bodies have gone through significant physical changes due to human interventions.

The most significant natural lakes located in the area: Szelidi lake, Fadd backwater, Szakmári lake, Matild lake.

Major artificial lakes / reservoirs: lakes next to Simontornya, cooling ponds of the Nuclear Power Plant, fishing ponds at Akasztó.

Within the study area the following settlements belong to the quality protection water catchment area zone of surface waters:

> *Harta, Akasztó, Duanpataj, Újtelek, Szakmár, Géderlak, Foktő, Ordas, Dunaszentbenedek, Uszód, Szekszárd, Őcsény, Dusnok, Fajsz, Nemesnádudvar, Sükösd.*

Surface waters can cause flood. Flood protection is a complex task: it includes not only direct water damage prevention, but also continuous maintenance and development of flood barriers and appropriate water control. Flood protection along the main engineering objects is a state responsibility.

From spatial development aspects the high-water river basin zone is connected to flood protection and the higher between the prevailing flood level or the ever highest flood level will define this area. OTrT prescribed that the county settlement plans should define the high-water river basin zone area. No building area can be approved on such areas. Practically it means that in areas where the dam is not high enough, there the high-water river basin can be defined up to the area surrounded with natural heights along the river valley.

After the zone has been designated, the high-water river basin will be registered also onto the title deeds of the relevant lands.

Within the study area the following settlements belong to the high-water river basin zone:

> *Dunaegyháza, Solt, Harta, Duanapataj, Ordas, Géderlak, Dunaszentbenedek, Uszód, Foktő, Bátya, Fajsz, Sükösd, Dunaföldvár, Bölcske, Madocsa, Paks, Gerjen, Fadd, Bogyiszló, Őcsény.*

9.2.3.3 Underground waters

The region has two types of underground waters: reservoir water in the Pannonian sandstone beds that are located deep below the aquitards, and soil water located above this in the Pleistocene-Holocene sequence.

The sequence contains a fill-up layer made of materials from sand structures extending to the soil water level, below that sediments can be found from floods of Danube river and made up of new Holocene clay, marl, sand and mud. Further from Danube riverbed an old-Holocene unconsolidated sand covers the original layers. Precipitation waters can migrate through these layers vertically down to the soil water level. There are original filled-up meanders forming a network in the low flood zone. At present the dams constructed at 96-97 mBf (meters above Baltic Sea level) from the flood line can protect the area from floods, but volatility in Danube water levels have direct impacts – primarily through the materials of the pinched-off original river basin – onto soil water levels.

The new Pleistocene terrace of Danube is 6-8 m higher than the Danube alluvial level. Its material contains sand from the riverbed with small gravel layers. The surface is covered with unconsolidated sand cover. By now Danube can hardly have any impact onto the soil water level of this terrace.

There is a loess plateau along the edge of Danube valley from north-west at 160-180 mBf height. Rainwater falling onto the surface of this loess plateau is migrating down and accumulated above the loan zones and migrates towards the erosion base through high-porosity layers. This is the supply zone for the Danube valley soil water. Sediments from Pannonian lakes form the basement of the soil water reservoir sequence. The Nuclear Power Plant was in fact built on the river terrace level covered with unconsolidated sand.

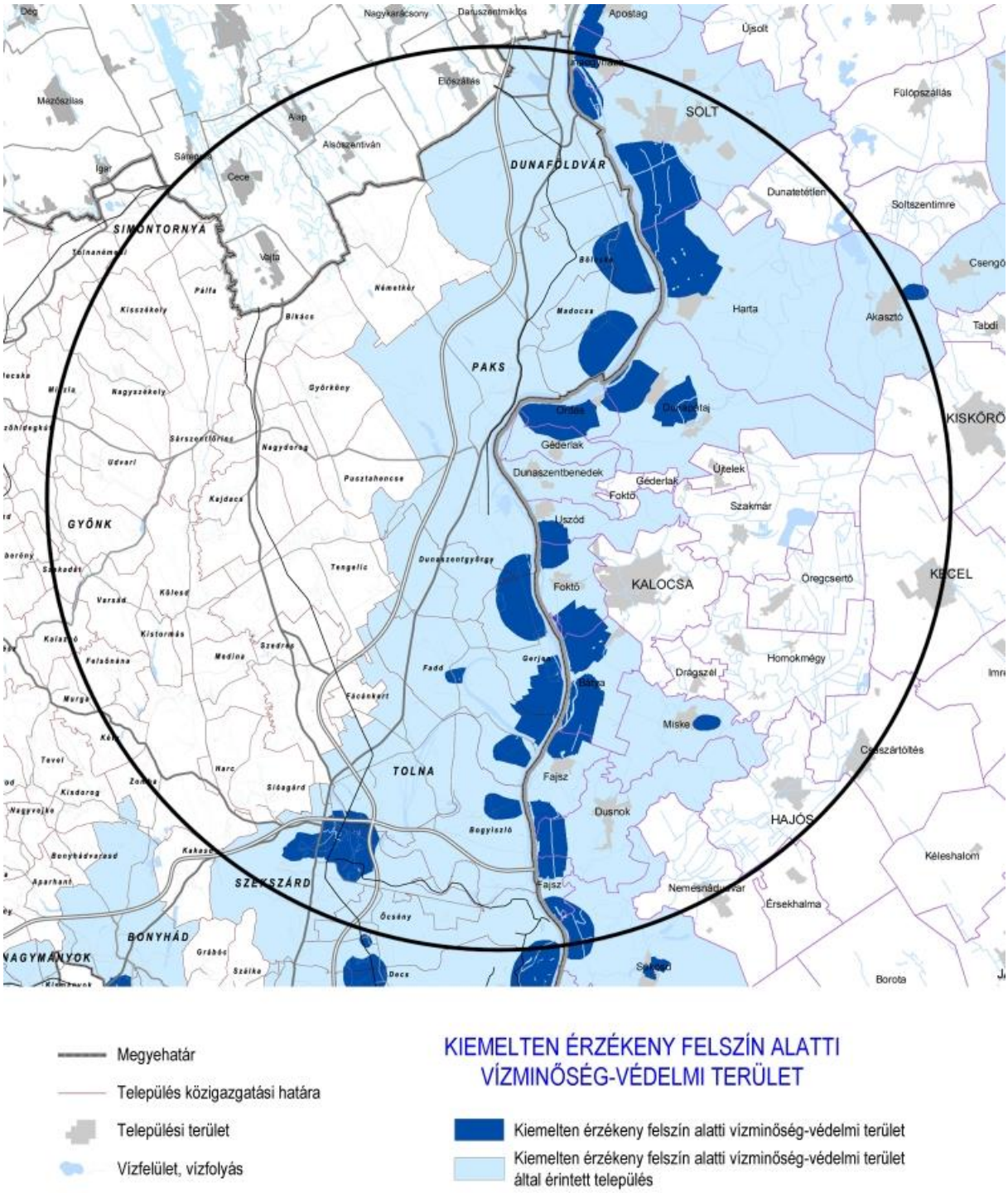
In Kalocsa-Sárköz area, i.e. on the east side of Danube river the average depth of soil waters is 6-8 m in the fill-up section next to the river basin, and 4-5 m somewhat farther. The water supply is to lesser extent coming from precipitation and to larger extent from the river when the water level is high in. The soil water quantity at this place is 3-4 l/s.km^2, and in the area along the Danube is as high as 7 l/s.km^2.

The sediment materials of water reservoir located deeper than 100 m is mainly Pannonian sand, muddy sand and clay. The average quantity of water stored in such reservoir is 1-1.5 l/s.km^2. The wells can typically extract water with 200 l/p flowrate, but there are significant differences in flowrates of various wells.

Reservoir and soil waters in South-Mezőföld have different character compared with underground waters in Kalocsai-Sárköz. Coherent soil water can be found only in the valleys between loess beds and on high flood zone areas expanding south-west from Paks. Here we can find 2-3 m soil water depth, whereas under the loess beds at 8-10 m depth (if any), moreover, under the high embankment along the Danube the soil water can be even found at 25-30 m depth. The water quantity can be estimated as average 1.5-2 l/s.km^2.

Here the depth of the sandy Pannonian layers (storing the reservoir water) can also reach 100 m. Quantity of reservoir waters is estimated as 1 l/s.km^2. The average unit The average unit water flowrate of the wells is calculated for 100 l/p.m.

The county's settlement plans also delineate a water quality protection area zone for the extremely sensitive underground waters (Figure 9.2.3-2).



Legend:
Kiemelten érzékeny felszín alatti vízminőség-védelmi terület – extremely sensitive underground water quality protection area
Kiemelten érzékeny felszín alatti vízminőség-védelmi terület által érintett település – settlement affected by extremely sensitive underground water quality protection area
Megyehatár – county boundary
Település közigazgatási határa – settlement administrative border
Települési terület – settlement area
Vízfelület, vízfolyás – water surface, water flow

Figure 9.2.3-2: Zone of extremely sensitive underground water quality protection area

The rule is that mining operations can be performed in the area in accordance with the regulations that cover the areas exempted for mining. Extension and delineation of the zone has significantly declined versus the area defined by the OTrT that was approved in 2003 and it affects less settlements. Underground waters need protection with the study area primarily along the Danube river. The following settlements are affected in the study area:

Dunaegyháza, Dunaföldvár, Solt, Harta, Madocsa, Bölcske, Dunapataj, Ordas, Paks, Dunaszentgyörgy, Fadd, Gerjen, Uszód, Foktő, Bátya, Miske, Tolna, Bogyiszló, Őcsény, Szekszárd, Sükösd.

Areas in Tolna county that belong to the said zone (present and long term changes) are primarily located along the Danube river, and Sió, Kapos and Völgységi streams. These water reservoirs are sensitive due to missing appropriate geological protection (porosity and shallow porosity), thus they require enhanced protection.

In Bács-Kiskun county the water quality protection areas of extremely sensitive underground waters are exposed to a high-level risk because they are located on the Danube gravel terrace area, sensitive to surface pollution and with high soil water position. In addition, unit water consumption has declined in the past years and thus waste waters were emitted into the environment with higher concentration rates. The regulation on the zone describes restrictions for mining operations.

In accordance with the Water Directive the goal is to achieve and maintain the good quantitative and chemical status for the underground waters. Good quantitative status means that utilisation of underground water reserves cannot cause long term decline in water level and damage to water habitats that are depending on underground waters. Good chemical status means that though pollutions might occur but they cannot cause danger to drinking water and other water use, including waters and inland eco-systems that are depending on underground waters.

9.2.3.4 Inland inundation

Water remaining in low-lying plain areas in local depressions for shorter or longer periods is qualified as inland inundation. As Hungary's plain regions typically have a natural feature that water cannot be drained on its own, large areas are regularly covered with water. Protection against such waters is secured with dominantly artificially installed inland inundation drainage system that can change the evolved status.

These waters are drained locally using public ditches in cities and villages, and on regional level through major waters (streams) in the valleys and inland inundation drainage canals specifically constructed for this purpose. Inland inundation water is drained from the settlements in the study area through the inland inundation drainage canals Szekszárd-Báta, Bölcske-Bogyiszló, Szekszárd-Simontornya and Kalocsa.

The spatial development plan defines the so-called areas exposed to regular inland inundation, which was delineated using the inland inundation „exposure map" developed by Pálfai. The map was prepared in two phases and the location and frequency of inland inundation (based on data of the water management inspectorate) during the past 20 years was taken into account, and then boundaries of certain zones were adjusted to the relevant topographic characteristics. This map describes the following four categories based on the frequency of inland inundation:

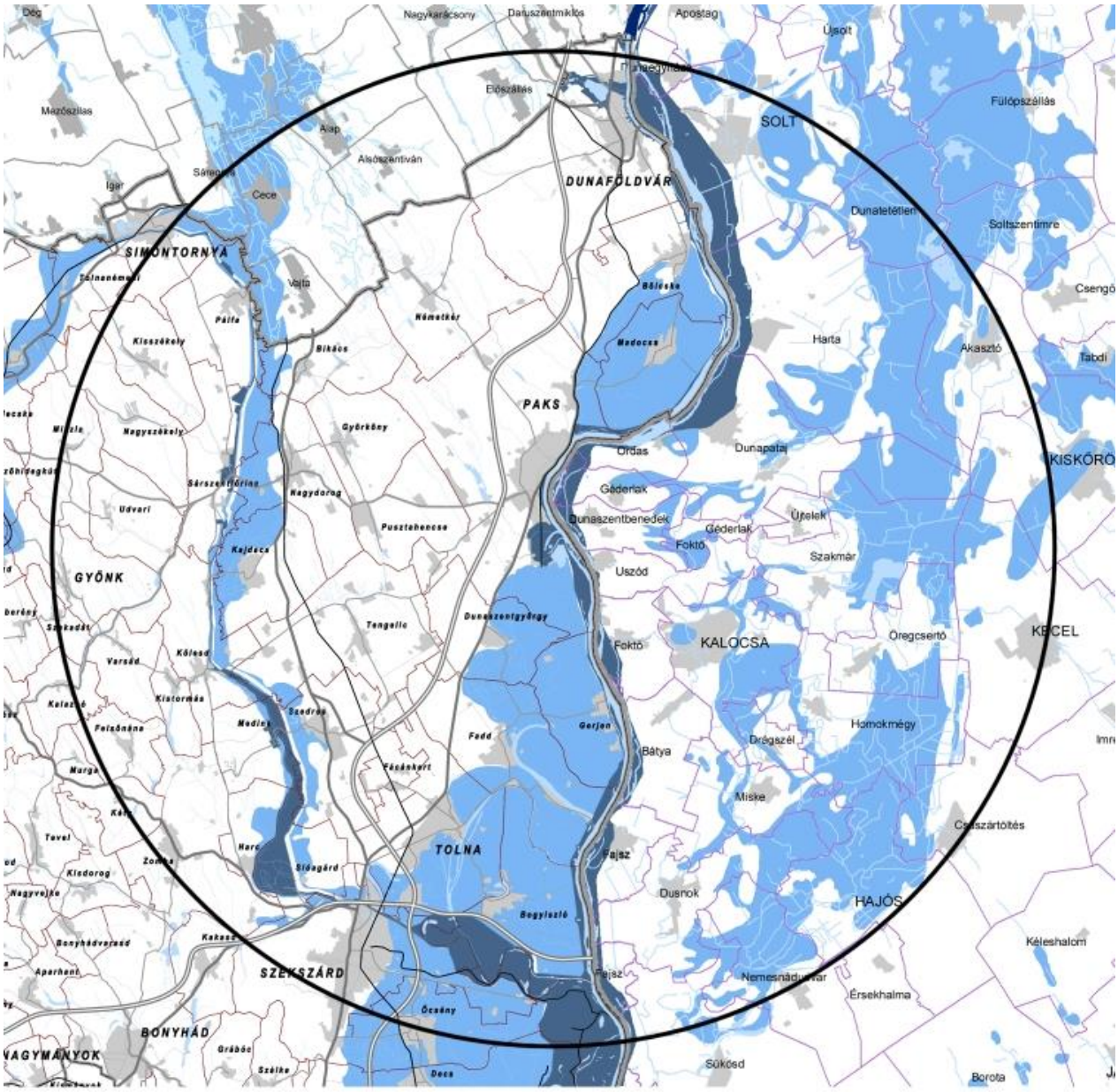
I. <0.05 (= inland inundation occurs maximum once in every 20 years) area not or only slightly exposed to inland inundation

II. 0.05-0.10 (= inland inundation occurs once in every 10-20 years) area moderately exposed to inland inundation

III. 0.11-0.20 (= inland inundation occurs once in every 5-10 years) area exposed to inland inundation on medium level

IV. >0,20 (= inland inundation occurs more often than in 5 years) are highly exposed to inland inundation

The effective county plans qualify every area as exposed to regular inland inundation that belongs into categories II. and III. according the the so-called Pálmai map.



Legend:
Rendszeresen belvízjárta terület nagyvízi meder – area exposed to regular inland inundation, high-water river basin;
Rendszeresen belvízjárta terület – area exposed to regular inland inundation
Nagyvízi meder – high-water river basin
Megyehatár – county boundary
Település közigazgatási határa – settlement administrative border
Települési terület – settlement area
Vízfelület, vízfolyás – water surface, water flow

Figure 9.2.3-3: Summarised area exposed to regular inland inundation within a 30 km radius and high-water river basin zone

Based on the settlement plans 63% of the study area is exposed to regular inland inundation, and only 27 among the studied 75 settlements do not belong into this zone.

9.3 TRANSPORTATION ROUTES OF THE REGION OF STUDY WITHIN A 30 KM RADIUS

We used the national, county and area settlement plans, and maps presenting Hungary's road network for preparing the profile of the transportation routes, and road, railway, waterway network and air space use related to the area.

The following data apply onto the study area (within a 30 km radius) and combine data of the three counties.

9.3.1 ROAD NETWORK

The road network elements affecting the area examined are as follows:

Motorways:

M6: Budapest (M0) – Dunaújváros – Szekszárd – Bóly (part of the TEN-T network)
M9: Szekszárd region – Duna - Dusnok region

Main roads:

Main road No.6: Budapest – Dunaújváros – Szekszárd – Pécs – Barcs - (Horvátország)
Main road No.61: Dunaföldvár (6. main road No.) – Dombóvár – Kaposvár – Nagykanizsa (Main road No. 7)
Main road No. 63: Tolna (6. main road No.) – Sárbogárd – Székesfehérvár (M7)
Main road No. 64: Simontornya (61. main road No.) – Balatonvilágos (Main road No 7.)
Main road No. 631: Szedres (M6 - Main road No. 63)
Main road No. 51: (Budapest) – Kalocsa – Baja – Hercegszántó – (Szerbia)
Main road No. 52: Kecskemét (5. main road No.) – Solt – Dunaföldvár (Main road No. 6)
Main road No. 53: Solt (52. main road No.) – Kiskunhalas – Tompa – (Szerbia)
Main road No. 54: Kecskemét (5. main road No.) – Soltvadkert – Sükösd (Main road No. 51)

New main road connections:

Kalocsa (Main road No. 51) – Kecel (Main road No. 54)

The planned bypass sections of main roads:

Main road No. 51: Solt, Harta, Dunapataj, Kalocsa, Sükösd
Main road No. 52: Solt
Main road No. 53: Akasztó, Kiskőrös
Main road No. 54: Kecel, Császártöltés, Hajós
Main road No. 61: Dunaföldvár, Simontornya, Cece

Main road No. 63: Nagydorog, Bikács, Cece

Planned minor roads of regional importance:

Paks (Main road No. 6) – Nagydorog – Tamási (Main road No. 61) (by using road No. 6232j)
Dunaföldvár (Main road No. 6) – Mezőfalva – Seregélyes (Main road No. 62) (by using road No. 6228j)
Minor road No. 6307j. Szabadbattyán – Cece
Main road No. 51; Solt – Main road No. 52; Solt
5303j. Kecskemét – Kiskőrös

Planned bypass sections of minor roads in the region:

Paks (on roads No. 6231j and 6232j)
Main road No. 61: Előszállás, Alsószentiván
Main road No. 63: Vajta

Planned new road connections:

Miszla – Sárszentlőrinc (as part of the minor road of regional importance between Paks - Nagydorog – Tamási)
Kalaznó – Sárszentlőrinc (as part of the minor road of regional importance between Hőgyész – Sárszentlőrinc)
Dunaföldvár (road No. 6229j) – Main road No. 61
Tolna – road No. 5112j – Fadd-Dombori ferry

Bölcske (road No. 51362j) – Main road No. 6
Paks – Dunakömlőd (between road No. 6231 and Dunakömlőd)
Gerjen – Paks
Fácánkert (road No. 51164j) – Main road No. 63
Szedres bypasses (between roads No. 63 – 6316. and 63 – 6235)
Németkér – Alap (Main road No. 61)
Bikács – Györköny
Pusztahencse – Road No. 6233j
Tengelic – connection between roads No. 6234 and 6235j
Bogyiszló – Szekszárdi port – road No. 51369j
Felsőnána – Kistormás
Udvari – Alsópélpuszta
Nagyszékely – road No. 6317j
Nagyszékely – Kisszékely
Kisszékely – Sárszentlőrinc
Miszla – road No. 6312j
Császártöltés – Kéleshalom
Homokmégy [Hillye] – Császártöltés
Kalocsa – Újtelek [Gombolyag] – Dunapataj [Szelidi-tó]
Szakmár – Szakmár [Csorna]
Dusnok – Miske
Dusnok – Rém

9.3.2 RAILWAY NETWORK

Elements of the railway network related to the studied region are the following:

International core lines of the network
Budapest – Dombóvár – Gyékényes – country border– (Rijeka)
Budapest – Kiskőrös – Kiskunhalas - Kelebia – country border- (Belgrade)

Other main lines
Sárbogárd - Rétszilas – Szekszárd – Bátaszék
Pusztaszabolcs - Mezőfalva – Paks (only freight traffic)

Secondary lines
Kunszentmiklós – Dunapataj (only freight traffic up to Solt)
Kiskőrös – Kalocsa (only freight traffic)

Narrow gauge railway
Kecskemét - Kiskőrös

9.3.3 WATERWAYS, PORTS

Waterways of international and national significance on the study area

Name of waterway	Section (km-km)	Waterway category
Danube (international waterway)	1641-1433	VI/C
Sió-channel	121-23	IV/periodically
Sió-channel	23-0	IV

Ferry lines crossing Danube river

Paks – Géderlak
Gerjen – Kalocsa

Public ports with significant traffic
Dunaföldvár, Madocsa, Paks, Fadd–Dombori, Bogyiszló, Foktő

Ports for passenger traffic only
Solt, Ordas, Uszód, Kalocsa, Fajsz

9.3.4 AIRPORTS

Airfields/airports that can be developed to commercial airport (international)
Őcsény
Kalocsa

9.4 LAND USE IN THE REGION OF STUDY WITHIN A 30 KM RADIUS - AREA STRUCTURE

1977-2009

Changes in area structure of Paks region between 1977 and 2009 can be described, based on the processed aerial and space photographs, as it follows:

- Paks region before 1970 – the implementation of the existing Nuclear Power Plant – the agricultural zone was the typical area (nearly 2/3 large-scale farming) with high next-to-nature ratio (forest 10 %, lawn 6 %, water surface above 5 %). The settlements adjusted to this landscape type, and food procession was the dominant sector in the silent and stagnating large village.
- Construction of the power plant brought significant changes also in the landscape structure: number of the engineering objects increased, an extended industrial area was developed, and as an auxiliary element a residential area was built for the employees. Growth in forest areas (protective forest) could be registered. The industry areas have been continuously increasing ever since, primarily between the settlement and the Nuclear Power Plant on the area located between Road No. 6. and Danube river. This change is however triggered not directly from growth in the Nuclear Power Plant area, but from re-arranging auxiliary and service areas, and other type of industrial and service facilities.
- The agricultural structure significantly changed around the millennium. Share of lands under large scale farming declined to 40 %, whereas share of small size lands increased to 18 % (compensation). Large-size lands are no longer dominant in the landscape structure and in the landscape. Sport, leisure time and resort areas also significantly increased as a clear indication for urban development.

2013

We prepared the surface cover map and the land use profile of the area within a 30 km radius of Paks site using the ortophotos generated from **coloured** (**RGB**) and **coloured infra** (**CIR**) aerial photographs taken in 2013 (Figure 9.3.4-1) as part of the initial studies.

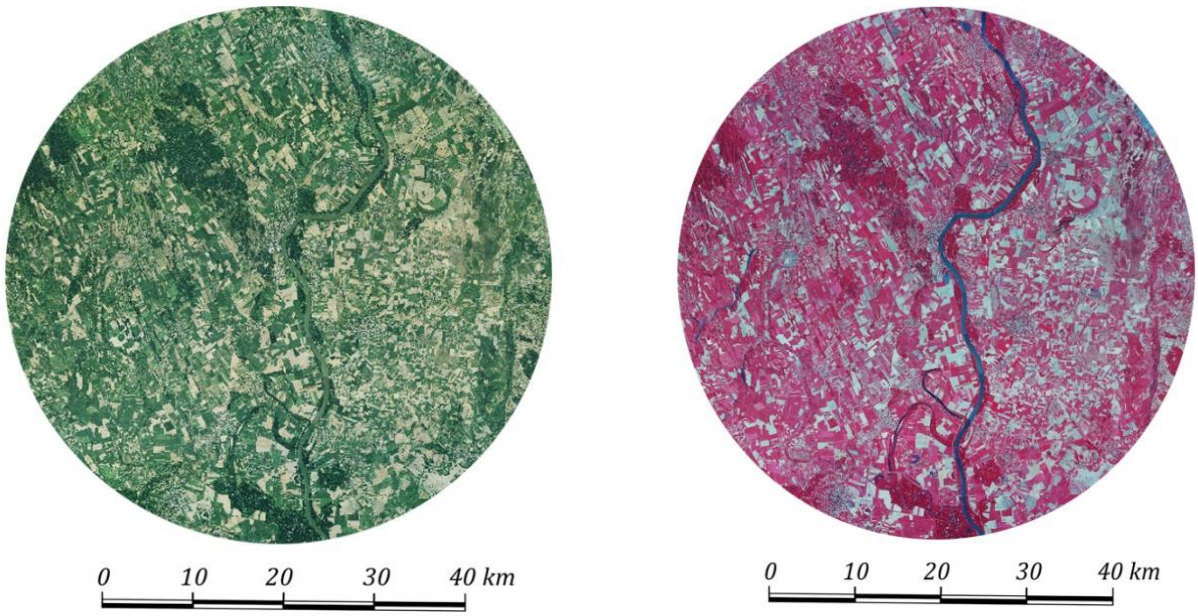


Figure 9.3.4-1: Coloured (RGB) and coloured infra (CIR) ortophoto of the study area within a 30 km radius in 2013

The surface cover map presents 47 surface cover categories. We retrieved these categories with computer and performed the statistical procession of the surface cover elements. Each category area was defined for displaying the results in a tabular format, and describing the land use / surface cover in a narrative format. Table 9.3.4-1 presents the statistics for the 2013 surface cover categories, and Table 9.3.4-2 presents the list of various categories based on their extension.

Figure 9.3.4-2 presents the surface cover / land use map of the area within a 30 km radius, prepared as the result of the procession work.

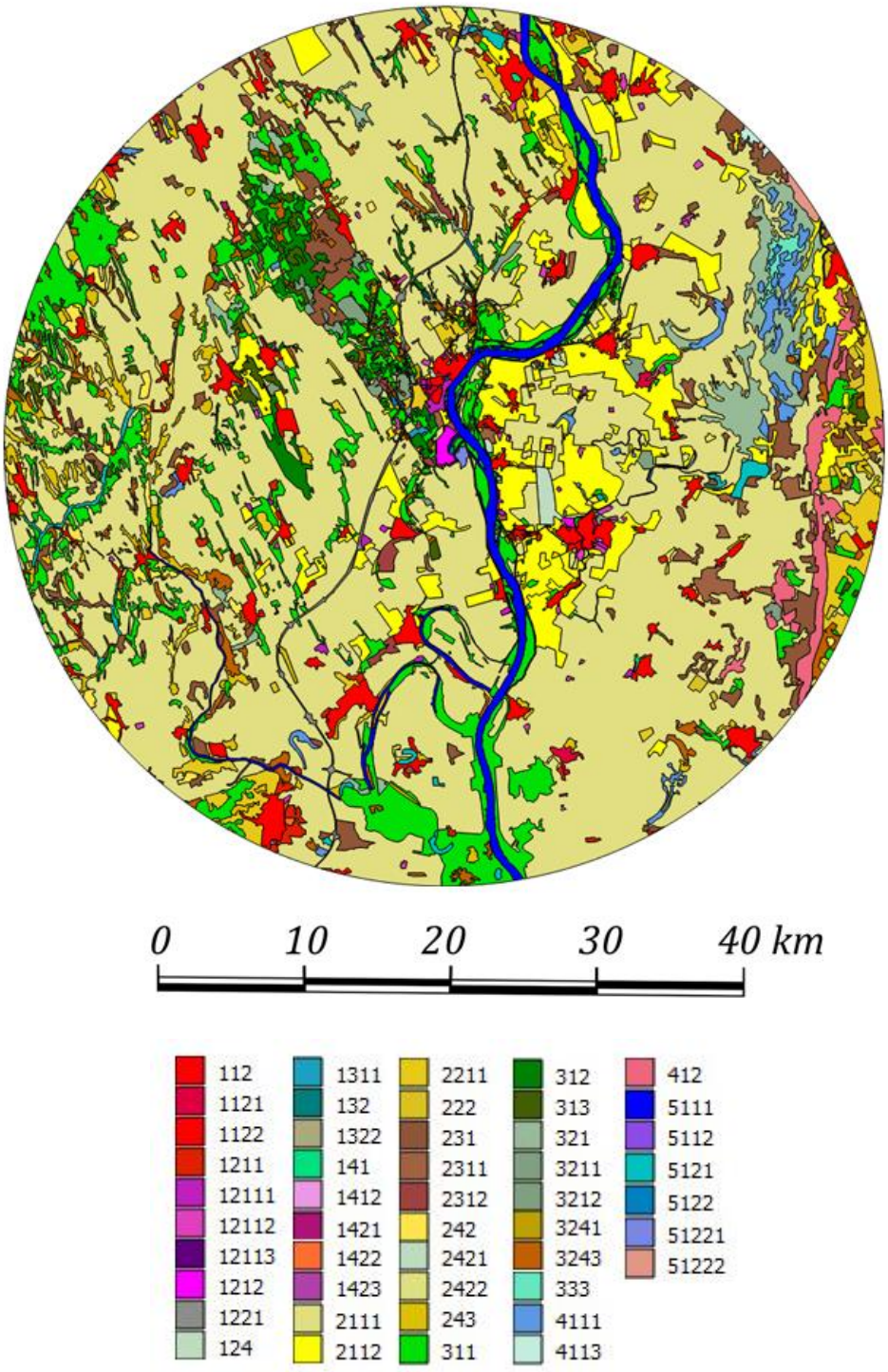


Figure 9.3.4-2: Surface cover / land use map of the study area within a 30 km radius in 2013– with colour code

Statistics of surface cover categories in the area within a 30 km radius in 2013

Sr.no.	Surface cover category	Name of surface cover	Occurrence (no.)	Extension of the category (km^2)	Extension of the category (%)	Polygon min. (km^2)	Polygon max. (km^2)
1	112	Non-coherent settlement structure	46	52,90	1,87	<0,01	5,16
2	1121	Non-coherent settlement structure, multi-storied houses without garden	5	3,30	0,12	0,04	1,61
3	1122	Non-coherent area with detached houses and gardens	56	51,78	1,83	<0,01	3,92
4	1211	Industrial and commercial units	25	8,88	0,31	<0,01	2,44
5	12111	Industrial and commercial facilities	24	4,34	0,15	0,01	1,31
6	12112	Agrarian facilities	67	8,71	0,31	0,02	0,44
7	12113	Education and medical or healthcare facilities	4	0,28	0,01	0,05	0,09
8	1212	Special technical facilities	12	3,92	0,14	0,02	2,40
9	1221	Road network and connecting areas	6	9,16	0,32	0,00	7,95
10	124	Airports with solid surface runway	1	4,43	0,16	4,43	4,43
11	1311	Outcrop mines	10	1,03	0,04	0,01	0,50
12	132	Waste depositories, refuse piles	7	0,58	0,02	0,04	0,17
13	1322	Storage facilities for fluid waste materials	2	0,08	<0,01	0,02	0,05
14	141	Urban green zones	5	0,69	0,02	0,03	0,30
15	1412	Cemeteries	9	0,34	0,01	0,01	0,10
16	1421	Sport facilities	4	0,48	0,02	0,06	0,26
17	1422	Leisure time areas	3	0,67	0,02	0,13	0,29
18	1423	Resort settlements	2	0,25	0,01	0,04	0,21
19	2111	Large–scale arable lands without irrigation	100	1595,65	56,44	<0,01	536,87
20	2112	Small-scale arable lands without irrigation	176	211,31	7,47	0,01	28,30
21	2211	Vineyards	50	63,14	2,23	0,06	8,07
22	222	Orchards, berries	12	5,98	0,21	0,18	0,93
23	231	Intensive pastures and strongly degraded lawn areas	142	110,88	3,92	<0,01	8,27
24	2311	Intensive pastures, strongly degraded lands without bushes/trees	55	19,02	0,67	0,01	4,49
25	2312	Pastures, strongly degraded lands without bushes/trees	43	9,37	0,33	0,01	2,39
26	242	Complex cultivation structure	75	36,93	1,31	0,01	1,61
27	2421	Complex cultivation structure without buildings	22	2,85	0,10	0,01	0,65
28	2422	Complex cultivation structure with scattered buildings	36	6,75	0,24	0,01	0,90
29	243	Primarily agricultural	115	49,38	1,75	0,02	2,22

Sr.no.	Surface cover category	Name of surface cover	Occurrence (no.)	Extension of the category (km²)	Extension of the category (%)	Polygon min. (km²)	Polygon max. (km²)
30	311	Deciduous forests	365	257,91	9,12	<0,01	35,17
31	312	Coniferous forests	51	24,95	0,88	<0,01	6,44
32	313	Mixed forests	58	24,99	0,88	0,01	2,29
33	321	Natural lawns, nature-like meadows	21	58,02	2,05	0,03	15,34
34	3211	Natural lawns without trees and shrubs	18	7,29	0,26	0,05	1,58
35	3212	Natural lawn with trees and shrubs	37	12,11	0,43	0,01	2,30
36	3241	Young forests and cutting zones	25	2,82	0,10	0,02	0,36
37	3243	Spontaneous shrubs - forest areas	149	45,34	1,60	0,01	2,34
38	333	Diffuse vegetation	1	3,99	0,14	3,99	3,99
39	4111	Sweetwater swamps	35	26,69	0,94	<0,01	6,88
40	4113	Saline swamps	2	1,09	0,04	0,24	0,85
41	412	Muskegs	7	29,88	1,06	0,60	17,67
42	5111	Running waters	6	49,68	1,76	0,07	40,41
43	5112	Channels	2	1,33	0,05	0,31	1,02
44	5121	Natural lakes	24	13,12	0,46	0,01	2,75
45	5122	Artificial lakes, water reservoirs, fish ponds	7	0,98	0,03	0,02	0,36
46	51221	Artificial lakes, water reservoirs	1	0,84	0,03	0,84	0,84
47	51222	Fish ponds	3	3,23	0,11	0,02	2,59
			1926	**2827,31**	**100**		

Table 9.3.4-1: Surface cover / land use statistcs of the study area within a 30 km radius in 2013.

Categories of surface covers within a 30 km radius in 2013 by extension

Category of occurrence	Surface cover category	Name of surface cover
Higher than 50,0 % dominant	2111	Large-scale not irrigated arable lands
10,0- 50,0 % dominant		None
5,0 – 10,0 % typical	311	Deciduous forests
	2112	Small-scale not irrigated arable lands
3,0 – 5,0 % slightly typical	231	Intensive pastures and strongly degraded lawn areas
1,0 – 3,0 not typical	2211	Vineyards
	321	Natural lawns, nature-like meadows
	112	Non-coherent settlement structure
	1122	Non-coherent are with detached houses and gardens
	5111	Running waters
	243	Primarily agricultural
	3243	Spontaneous shrubs and forest areas
	242	Complex cultivation structure
	412	Muskegs
0,5 – 1,0 % not significant	4111	Sweetwater swamps
	313	Mixed forests
	312	Coniferous forests
	2311	Intensive pastures and strongly degraded lawns without bushes and trees
Lower than 0,5 ignorable	5121	Natural lakes
	3212	Natural lawn with trees and shrubs
	2312	Intensive pastures and strongly degraded lawns with bushed and trees
	1221	Road network and connecting areas
	1211	Industrial and commercial units
	12112	Agrarian facilities
	3211	Natural lawn without trees and shrubs
	2422	Complex cultivation structure with scattered buildings
	222	Orchards, berries
	124	Airports with solid surface runway
	12111	Industrial and commercial facilities
	1212	Special technical facilities
	333	Diffuse vegetation
	1121	Not-coherent settlement structure, without gardens, with multi-storied houses
	51222	Fishponds
	2421	Complex cultivation structure without buildings
	3241	Young forests and cutting areas
	5112	Channels
	1311	Outcrop mines
	4113	Saline swamps
	5122	Artificial lakes, water reservoirs, fishponds
	51221	Artificial lakes, water reservoirs
	132	Waste depository facilities, refuse piles
	141	Urban green zones
	1421	Sport facilities
	1422	Leisure time areas
	12113	Education and medical or healthcare facilities
	1322	Storage facilities for fluid waste materials
	1412	Cemeteries
	1423	Resort settlements

Table 9.3.4-2: Land use categories of the study area within a 30 km radius in 2013 based on their typical extension

Profile of surface cover of the area within a 30 km radius in 2013

- The „**dominant**" (higher than 50 %) form of landscape use is the use non-irrigated large-scale arable land use, representing 56 % in the area.
- There was no surface cover element classified in the „**determining**" (between 10-50 %) category.
- The „**characteristic**" (between 5-10 %) land use category contains two surface cover elements: a deciduous forest (9.12 %) and small-scale non-irrigated arable lands (7.47 %).
- There was one element in the „**slightly characteristic**" (between 3-5 %) land use category, Intensive pastures and strongly degraded lawn areas (3.92 %)
- Nine 9 different surface cover types form the „**not characteristic**" (between 1.0-3.0 %) category. There are the following:
    - Vineyards (2.23 %)
    - Natural lawns, nature-like meadows (2.05 %),
    - Non-coherent settlement structure (1.87 %),
    - Non coherent area with detached house and gardens (1.83 %),
    - Running waters (1.76 %).
    - Primarily agricultural areas (1.75 %),
    - Spontaneous shrubs -forest areas (1.60 %).
    - Complex cultivation structure (1.31 %)
    - Muskegs (1.06 %)
- The „**not significant**" (between 0.5-1.0 %) category contains 4 surface cover elements. These are the following:
    - Sweet water swamps (0.94 %),
    - Mixed forests (0.88 %)
    - Coniferous forest k (0.88 %),
    - Intensive pastures and strongly degraded lawns without bushed and trees (0.67 %)
- The „ **ignorable**"(lower than 0.5 %) category contains 30 very mixed surface cover types.

Summary of land use characteristics of the area within a 30 km radius in 2013

- Mosaic structure and volatility are still characteristic for the landscape structure in the environment of Paks and the power.
- Agricultural areas are still significant in respect of extension. Cultivation of large-scale farming non-irrigated arable lands has increased and is still the highest share in the region (56 %). Share of small-scale non-irrigated arable lands in the agricultural production area declined to 7,5 %.
- Deciduous forests represent 9 %. Regional location of course did not change and these forests can be found along the Danube river, and on smaller hills situated west and northwest from the settlement.
- Intensive pastures and strongly degraded lawn areas (~4 %) can be regarded as somewhat characteristic land use in the region.
- Other forms of land use now do not represent major land use (<1 %).

Summary assessment

Summarising changes in the ratio of land use forms between 1977. and 2013. we can state that most of the land use forms have not or only slightly changed.

The Regional structural changes can be only to lesser extent connected to the implementation of the Nuclear Power Plant (e.g. extension of the industrial zone, establishing protective forests, urban development).

9.5 SPATIAL DEVELOPMENT CONCEPTS, PROGRAMS

9.5.1 NATIONAL SPATIAL DEVELOPMENT CONCEPT

National Spatial development Concept - 2005

The National Spatial development Concept (OTK) was adopted by virtue of resolution 97/2005. (XII. 25.) OGY (Hungarian Parliament) and it defined the future area concept for the country, political objectives leading to the implementation of this vision through a comprehensive long term Spatial developments, the medium-term local goals, the conditions of the asset and institution system and it contains the specific conceptional targets of the relevant regions.

The following five comprehensive targets shall be fulfilled in order that the harmonised area structure and system and a well-balanced rural development can be implemented by 2020, as set out in the OTK vision:

1. regional competitiveness,
2. to catch up the area ,
3. sustainable spatial development and heritage protection,
4. integration of the area into Europe,
5. decentralisation and regionalism.

The following national comprehensive goals were defined for medium-term, i.e. until 2013 related to the studied region:

- to strengthen development poles for energizing the region and to develop the system of connection network of the city,
- to catch up the under-developed regions, and the external and internal peripheries,
- integrated development regions and topics of national significance:

  sustainable development of areas next to Danube river,

  to increase share of renewable energy sources,
- development of areas along the national borders and to improve cross-border regional cooperation of such areas.

National Development 2030 – National Development and Spatial development Concept

The National Economic Planning Office (NTH), the background institution of the Ministry of National Economy (NGM) and the Secretariat of State responsible for coordination of the planning process prepared a strategic discussion paper for the National Development and Spatial development Concept (OFTK) titled as National Development 2020, and the NGM launched social consultations for this document on December 17, 2012. Comments and observations on the document could be sent to the NTH by January 31, 2013 using the OFTK Social Consultation website. The National Development and Spatial development Concept has a time horizon looking forward until 2030, and the Parliament adopted the document by virtue of resolution 1/2014. (I. 3.) OGY.

The Parliament set out four long term development targets described in the Concept to be implemented until 2030 in order that the national vision can be accomplished. These four targets address the society and economy as a whole, including also attitude to the society and economic environment and environmental aspects. Comprehensive goals are aiming at an economic and social turning point as it follows:

a) economic development that can create value and employment,

b) demographic turn, healthy and renewable society,

c) sustainable use of natural resources, preservation and values and protection of the environment,

d) sustainable spatial structure based on regional potentials.

The Parliament confirmed the thirteen specific targets set out in the Concept, including seven special political targets and six local targets in order that the comprehensive targets can be implemented. The specific targets embrace sectoral and topic areas of national significance.

Specific targets to be applied and enforced in special politics:

aa) competitive, innovative economy,

ab) Hungary for healing, healthy society, health and sport economy,

ac) viable rural areas, healthy food production and supply, developments in the food-processing industry,

ad) creative knowledge-based society, marketable capabilities and competences, R+D+I,

ae) society with value-awareness and solidarity-based self-reliance,

af) good state, service-providing state and security,

ag) retaining and sustainable use of strategic resources, protection of our environment,

Area-specific goals:

ba) to strengthen the country's macro-regional role,

bb) city network that can ensure multi-centre spatial structure,

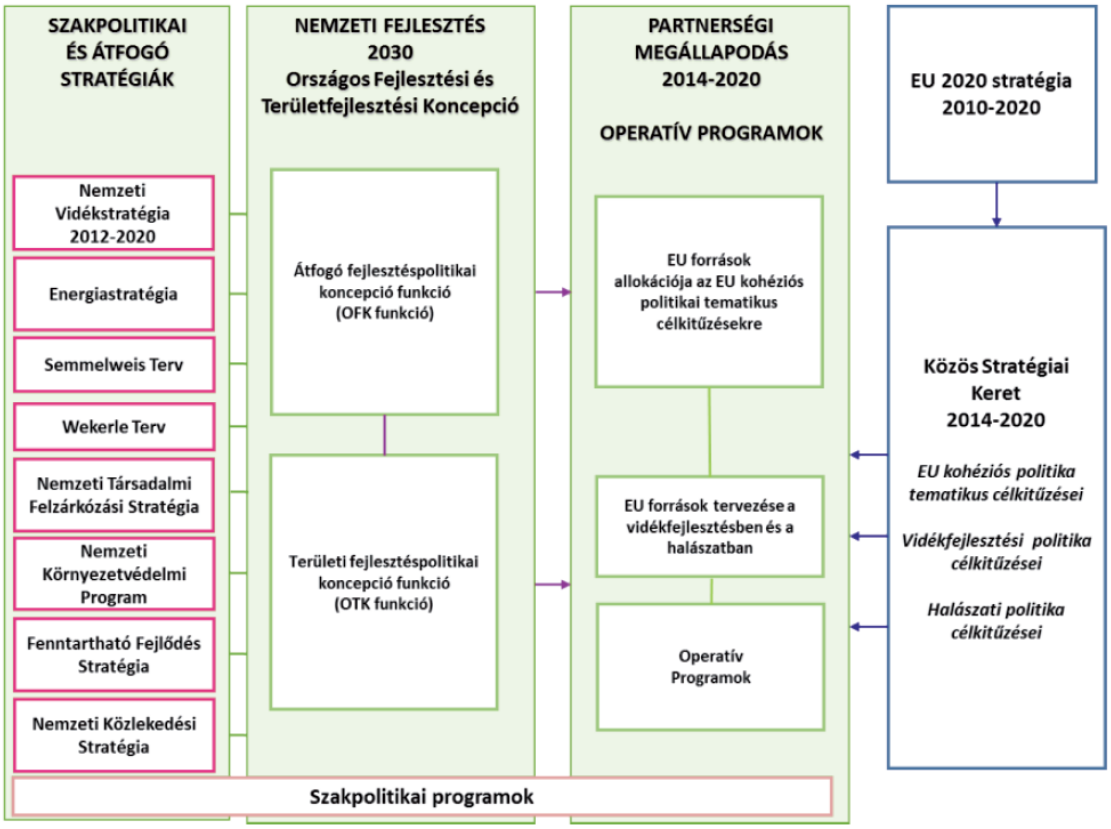
bc) to enhance population retention capacity of rural regions,

bd) development of regions with outstanding landscape value,

be) to reduce differences between regions, to support regional alignment and to energize the economy,

bf) inter-connected areas: to secure availability and mobility.

The Parliament states that the European Union cohesion policy and rural development policy, and the EU development funds available during the 2014–2020 programming and development period provide the primary framework for the development politics. The Concept starts from national demands and specifications, and sets out the medium term (between 2014–2020) strategic focus points that can support the implementation of the country's long term objectives. The national priorities are adjusted to the programming frameworks set out by the European Union, and these shall be applied during the domestic planning and implementation process. The development topics identified within the relevant national priorities can also support the topics of the 2014–2020 development programs forming the framework of utilisation of the European Union funds.



Legend:
Szakpolitikai és átfogó stratégiák – national development and overall strategies
Nemzeti vidékstratégia 2012-2020 – national rural strategy
Energiastratégia – energy strategy
Semmelweis terv –Semmelweis plan
Wekerle terv – Wekerle plan
Nemzeti Társadalmi Felzárkozási Stratégia –National Social Integration Strategy
Nemzeti Környezetvédelmi Program –National Environmental Protection Program
Fenntartható Fejlődés Stratégia – Sustainaible Development Strategy
Nemzeti Közlekedési Stratégia – National Transport Strategy
Nemzeti fejlesztés 2030 – national development 2030
Országos Fejlesztési és Területfejlesztési Koncepció – National Development and Regional Development Concept
Átfogó fejlesztéspolitikai koncepció funkció (OFK funkció) – Overall development policy concept (OFK)
Terület fejlesztéspolitikai koncepció funkció (OTK funkció) – Regional development policy concept (OTK)
Partnerségi megállapodás 2014-2020 – partnership agreement 2014-2020
Operatív programok – operational programmes
EU források allokációja az EU kohéziós politikai tematikus célkitűzésekre – Allocation of EU funds on EU cohesion political thematic targets
EU források tervezése a vidékfejlesztésben és a halászatban – Planning of EU funds in rural development and fishery
Operatív programok – operational programmes
EU 2020 stratégia –EU 2020 strategy
Közös Stratégiai Keret – Common Strategy Framework
EU kohéziós politika tematikus célkitűzései – Thematic targets of EU cohesion politics
Vidékfejlesztési politika célkitűzései – Targets of rural development politics
Halászati politika célkitűzései – Targets of fishery policy
Szakpolitikai programok – Special political programs

Figure 9.5.1-1: Connection of the National Development and Spatial development Concept to the Union programming

9.5.1.1 National Development Plan II. – New Hungary Development Plan

The Government adopted the New Hungary Development Plan on October 25, 2006.

The development plan was prepared at the European Union's request, and it entails that Hungary can use 22,4 billion euros for implementing the developments. The New Hungary Development Plan broke down the goals, strategies, focus points, priorities and also specific action proposals for the applications that will be submitted to the competent authorities applying for the EU funds.

The developments are focusing onto six areas that are related to Operational Programmes.

Development area:

Economic development

- *Economy Development Operational Programme*

Traffic development

- *Traffic Infrastructure Development Operational Programme*

Renewal of the society renewal

- *Social Renewal Operational Programme*
- *Social Structure Operational Programme*

Environment and energy development

- *Environment and Energy Development Operational Programme*

Spatial development

- *North-Hungary Regional Operational Programme*
- *North-Great Plain Regional Operational Programme*
- *South-Great Plain Regional Operational Programme*
- *Central Hungary Regional Operational Programme*
- *Central Transdanubian Regional Operational Programme*
- *South Transdanubian Regional Operational Programme*
- *West Transdanubian Regional Operational Programme*
- *European Regional Cooperation Operational Programme*

State reform

- *Public Administration Renewal Operational Programme*
- *Electronic Public Administration Operational Programme*

9.5.2 OPERATIONAL PROGRAMMES

The South-Transdanubian and the South-Great Plain Operational Programme have effects onto the studied region among actions in the Operational Programmes.

9.5.2.1 South-Transdanubian Operational Programme (DDOP) 2007-2013

The Hungarian Government adopted the South-Transdanubian Operational Programme in December 2006, and this document defined the relevant actions for 2007-2013 for the area of Somogy, Baranya and Tolna counties with the purpose to catch-up the region.

The strategic target of this program (until 2013) is to stop the exclusion of the South-Transdanubia region. To this strategic goal the DDOP defined three specific targets:

- To prepare a high environment quality model region (to preserve the natural and man-made environment)
- To establish a competitive economy based on local parameters
- To eliminate social differences within the region.

Three spatial development zones were defined in the South-Transdanubian region, and one of them is related to the study area. The Paks-Szekszárd-Mohács-(Lower Danube valley) axis suggests that business services should be developed in the field of logistics and agrarian logistics, and touristic developments in the wine-producing areas – as based on this touristic core product. Cooperation with the South-Great Plain region and establishment of the Danube-valley Economic Zone are critical issues. Economic and service roles of the small regional and micro-regional centres should be strengthened in order that development of regions can be ensured.

9.5.2.2 South-Great Plain Operational Programme (DAOP) 2007-2013

As set out in the Operational Programme, the South-Great Plain region (that includes the area of Bács-Kiskun, Békés and Csongrád counties) the comprehensive goal here is to ensure sustainable growth and development, to expand employment and to balance-off the differences between the regions.

Among the DAOP priority axes the following are related to the studied region:

- traffic infrastructure development, where small and most retarded regions of the county are presented as points of preference, like Bácsalmás and Jánoshalma small region, and region along the Danube and Tisza rivers in Bács-Kiskun county;
- spatial development actions.

The main targets of the traffic infrastructure-development priority axis is to improve accessibility of retarded small regions and to mitigate inequalities between the settlements and small regions.

Actions of the priority axis:

- infrastructure projects that can improve road accessibility conditions for small regions,
- modernisation of community and public traffic,
- development of public road infrastructure related to logistical projects,
- construction of cycle road network,
- development of inner zone public road network.

The program defines three development axes in the South-Great Plain region, and one of them is related to the study area, namely the zone along the Danube river: Soltocsa-Baja axis. As the concept describes, settlements where development can be connected to these axes will be economically integrated, and here innovation and competitiveness-based economic development can begin and their infrastructure can allow organic cooperation.

9.5.3 DANUBE COMPLEX PROGRAM

The Danube Complex Program was completed in 2006 for the 20 small regions directly connected to the river, the embankment section at Budapest, and the area of Danube-Tisza-Sand Zone (14 small regions). The priorities of the Program refer to the 2007-2013 planning-programming period, but several targets in the Program can be implemented only on long term. Economic and social results of “quick-win” type technical interventions can be seen only later (10-15 years), whereas the ecological impacts even later.

Goals and priorities:

- To strengthen the trans-European integrating role of Danube river
  - Development of Trans-European and internal inter-regional cooperation in an environmentally-friendly manner
  - To strengthen the region’s role in the international division of labour.
- To establish a sustainable economic structure
  - Development of landscape-conform forms of tourism
  - Environmentally-aware expansion of conditions that can energize the industry
  - Establishment of competitive agrarian sector based on parameters that can develop the landscape
- Conservation and development of natural resources
  - Establishment of complex water management system
  - Development and maintenance of planned ecological environment
  - Mitigation of loads onto the environment.

9.5.4 DANUBE REGION STRATEGY

In 2009 the European Commission asked 14 countries to cooperate in preparing the Danube Region Strategy, basically focusing onto EU member states, but involving also the non-EU member states located along the Danube river as strategic partners.

The goal of the Danube Region Strategy is to define Danube macro region in the new budget period (starting in 2014) as a common European development and research region. The strategy will strengthen the regional cohesion and contribute to mitigating the differences in the level of development in the region. The strategy is based on the principle of „three NO-s": it does NOT establish a new institutional system, it does NOT imply new EU legalisation and it does NOT provide a separate budget line.

The main topics of the Danube Region Strategy can be defined around four key pillars. Each of these pillars contains key issues that represent action areas with outstanding significance. These issues are following:

1) Connection of the Danube region to the other regions in order that the following can be secured:

- Development of mobility and inter-modality,
  a) inland water shipping lines,
  b) public road, railway and aerial connection,
- Incentives for using sustainable energy,
- Promotion of culture and tourism, and inter-personal relations among people.

2) Protection of the environment in Danube region in order that:

- water quality can be restored and preserved,
- environmental risks can be managed,
- biodiversity, and quality of landscape, air and soil can be protected.

3) To establish welfare in Danube region in order that:

- knowledge-based society can be established with the help of research, education and information technologies,
- support to improve competitiveness of undertakings, including development of regional cooperation (clusters) among undertakings,
- investment into human resource and competences.

4) To strengthen Danube region in order that:

- expansion of the institution system and enforcement of institutional cooperation,
- improving security, struggle against challenges due to serious crimes and organised crime through common efforts and cooperation.

9.6 PROFILE OF POPULATION LIVING WITHIN A 30 KM RADIUS IN THE REGION

9.6.1 SETTLEMENTS LOCATED IN THE STUDY AREA

There are 75 settlements within a 30 km radius of Paks.

Tolna county					**Bács-Kiskun county**			**Fejér county**
Bikács	Felsőnána	Kistormás	Németkér	Szakadát	Akasztó	Fajsz	Miske	Alap
Bogyiszló	Gerjen	Kisszékely	Őcsény	Szedres	Bátya	Foktő	Nemesnádudvar	Alsószentiván
Bölcske	Gyönk	Kölesd	Paks	Szekszárd	Császártöltés	Géderlak	Ordas	Cece
Daruszentmiklós	Györköny	Madocsa	Pálfa	Tengelic	Drágszél	Hajós	Öregcsertő	Előszállás
Dunaföldvár	Harc	Medina	Pusztahencse	Tolna	Dunaegyháza	Harta	Solt	Nagykarácsony
Dunaszentgyörgy	Kajdács	Miszla	Sárszentlőrinc	Tolnanémedi	Dunapataj	Homokmégy	Sükösd	Sáregres
Fácánkert	Kalaznó	Nagydorog	Simontornya	Udvari	Dunaszentbenedek	Kalocsa	Szakmár	Vajta
Fadd	Kéty	Nagyszékely	Sióagárd	Varsád	Dunatetétlen	Kecel	Újtelek	
				Zomba	Dusnok	Kiskőrös	Uszód	

Table 9.6.1-1: Settlements within a 30 km radius of Paks – by counties

Settlements within the radius of 0-10 km						
Dunapataj	Dunaszentbenedek	Dunaszentgyörgy	Fadd	Foktő	Géderlak	Gerjen
Györköny	Madocsa	Ordas	Paks	Pusztahencse	Tengelic	Uszód
Settlements within the radius of 10-30 km						
Akasztó	Daruszentmiklós	Felsőnána	Kecel	Nagydorog	Sárszentlőrinc	Tolna
Alap	Drágszél	Gyönk	Kéty	Nagykarácsony	Simontornya	Tolnanémedi
Alsószentiván	Dunaegyháza	Hajós	Kiskőrös	Nagyszékely	Sióagárd	Udvari
Bátya	Dunaföldvár	Harc	Kistormás	Nemesnádudvar	Solt	Újtelek
Bikács	Dunatetétlen	Harta	Kisszékely	Németkér	Sükösd	Vajta
Bogyiszló	Dusnok	Homokmégy	Kölesd	Őcsény	Szakadát	Varsád
Bölcske	Előszállás	Kajdács	Medina	Öregcsertő	Szakmár	Zomba
Cece	Fácánkert	Kalaznó	Miske	Pálfa	Szedres	
Császártöltés	Fajsz	Kalocsa	Miszla	Sáregres	Szekszárd	

Table 9.6.1-2: Settlements located within a 0-10 km radius and a 30 km radius

9.6.2 DISTRIBUTION AND DEMOGRAPHIC DATA OF THE POPULATION

We present distribution and demographic data of population of Paks and the 75 settlements located within a 30 km radius using data of the Central Statistical Office (KSH) and with the following parameters.

- total population broken down to settlements
- data for population growth / decline:
    - immigrants and emigrants
    - fertility, mortality
    - ageing index
- population density / population distribution broken down to settlements
- gender distribution
- break down of gender age groups:
    - 0-14
    - 15-24
    - 25-64
    - above 64

9.6.2.1 Demographic characteristics

We present these data broken down to county – small region – settlement (city/village)

County	Micro-region	Settlement	Inhabitants on January 1, 2011	Inhabitants on January 1, 2012	Aging index on January 1, 2012	Births 2011	Deaths 2011	Moving in 2011	Moving away 2011	Area (ha) January 1, 2012	Population density January 1, 2012
Bács-Kiskun	Bajai	Sükösd	3 721	3 693	128,8	29	53	153	160	9 418	39
		Nemesnádudvar	1 836	1 802	137,3	12	34	45	58	5 878	31
	Kalocsai	Foktő	1 620	1 606	225,7	12	30	72	68	3 146	51
		Fajsz	1 667	1 658	193,4	13	21	80	88	3 199	52
		Géderlak	988	983	119,1	7	19	53	42	1 874	52
		Dusnok	2 912	2 873	143,3	20	37	78	101	5 747	50
		Kalocsa	17 165	16 959	147,4	132	208	671	798	5 318	319
		Drágszél	328	329	145,5	0	6	30	23	1 259	26
		Dunapataj	3 211	3 169	267,2	17	39	141	158	9 047	35
		Öregcsertő	789	753	165,0	5	19	41	66	4 306	17
		Dunaszentbenedek	813	812	152,1	9	7	33	34	2 324	35
		Bátya	2 051	2 023	188,0	13	34	127	131	3 386	60
		Dunatetétlen	543	530	172,3	7	11	26	36	4 319	12
		Ordas	413	415	191,1	3	4	28	24	1 652	25
		Uszód	1 049	1 008	182,7	7	14	36	67	2 446	41
		Harta	3 300	3 275	222,0	25	52	130	131	12 968	25
		Hajós	3 160	3 134	203,1	21	44	88	93	8 992	35
		Szakmár	1 139	1 148	139,4	5	15	82	70	7 464	15
		Homokmégy	1 312	1 326	201,4	8	21	103	79	7 032	19
		Solt	6 359	6 285	136,0	48	100	291	296	13 267	47
		Miske	1 683	1 656	141,2	9	29	89	96	4 227	39
		Újtelek	389	373	323,7	0	10	15	23	956	39
	Kiskőrösi	Kiskőrös	14 269	14 259	143,8	116	175	565	515	10 223	139
		Császártöltés	2 354	2 323	232,0	20	38	84	95	8 206	28
		Kecel	8 781	8 687	131,3	71	130	239	295	11 448	76
		Akasztó	3 247	3 230	134,5	23	35	124	135	6 488	50
	Kunszentmiklósi	Dunaegyháza	1 497	1 504	109,9	12	20	122	100	1 012	149
Fejér	Dunaújvárosi	Nagykarácsony	1 369	1 361	153,3	8	21	67	68	3 046	45
		Előszállás	2 157	2 186	125,2	15	27	163	126	3 998	55
		Daruszentmiklós	1 624	1 597	118,0	10	19	87	106	1 912	84
	Sárbogárdi	Vajta	1 038	1 053	140,0	6	15	52	45	2 343	45
		Sáregres	777	752	115,3	2	17	53	61	2 616	29
		Cece	2 547	2 499	125,1	18	39	94	122	5 885	42
		Alsószentiván	614	608	145,8	4	8	21	23	3 965	15
		Alap	1 953	1 925	172,0	8	42	103	103	4 829	40
Tolna	Paksi	Paks	19 625	19 510	129,3	146	199	698	773	15 408	127
		Gerjen	1 205	1 199	115,5	6	17	55	51	3 628	33
		Bölcske	2 828	2 825	122,0	20	39	151	132	5 878	48

County	Micro-region	Settlement	Inhabitants on January 1, 2011	Inhabitants on January 1, 2012	Aging index on January 1, 2012	Births 2011	Deaths 2011	Moving in 2011	Moving away 2011	Area (ha) January 1, 2012	Population density January 1, 2012
Tolna	Paksi	Dunaszentgyörgy	2 534	2 520	146,2	28	28	111	120	3 763	67
		Bikács	433	433	108,5	5	8	19	19	3 467	12
		Györköny	938	938	141,7	3	14	64	56	3 160	30
		Kajdacs	1 231	1 210	121,3	6	24	73	76	3 773	32
		Németkér	1 681	1 688	97,1	12	10	82	82	6 497	26
		Nagydorog	2 673	2 618	139,0	20	37	91	133	4 144	63
		Pusztahencse	984	978	83,1	11	6	47	59	3 171	31
		Sárszentlőrinc	941	932	147,4	6	12	49	50	4 669	20
		Madocsa	1 877	1 881	107,8	15	27	73	56	4 333	43
		Dunaföldvár	8 776	8 666	130,5	66	144	413	454	11 142	78
	Szekszárdi	Bogyiszló	2 211	2 193	111,0	18	36	111	115	5 593	39
		Kistormás	324	331	80,4	0	5	36	23	1 135	29
		Tengelic	2 290	2 254	140,2	9	40	148	155	7 093	32
		Őcsény	2 380	2 389	121,2	16	28	160	144	7 261	33
		Kölesd	1 516	1 478	100,0	14	24	81	109	3 813	39
		Harc	901	901	97,6	9	10	54	56	1 586	57
		Felsőnána	604	577	83,3	4	9	17	41	1 890	31
		Szedres	2 308	2 299	120,0	13	26	105	116	4 631	50
		Fadd	4 403	4 317	119,4	38	58	202	274	6 754	64
		Zomba	2 065	2 047	122,7	14	29	88	93	5 730	36
		Kéty	683	694	139,1	5	4	38	29	1 656	42
		Szekszárd	33 720	33 311	154,6	309	360	1 666	1 991	9 628	346
		Fácánkert	630	633	130,5	7	4	44	44	1 070	59
		Tolna	11 439	11 367	137,7	94	164	533	535	7 107	160
		Sióagárd	1 268	1 246	134,7	6	13	41	57	2 440	51
		Medina	821	805	121,1	2	10	58	68	2 224	36
	Tamási	Miszla	271	272	333,3	1	6	28	19	3 471	8
		Varsád	364	372	155,7	5	1	20	16	2 156	17
		Nagyszékely	441	437	95,3	6	11	19	21	3 670	12
		Tolnanémedi	1 079	1 067	285,7	8	21	38	38	2 195	49
		Szakadát	248	238	198,1	0	10	11	13	1 070	22
		Simontornya	4 086	4 028	150,0	23	65	165	184	3 383	119
		Udvari	404	400	392,0	0	7	19	16	1 941	21
		Kalaznó	167	145	189,6	0	6	19	35	1 835	8
		Kisszékely	307	297	172,1	2	11	19	16	2 830	10
		Gyönk	2 009	2 066	216,2	12	71	210	90	3 812	54

Table 9.6.2-1: Demographic characteristics in 75 settlements located in Paks and within a 30 km radius

9.6.2.2 Resident population broken down by gender – in 2012

County	Micro-region	Settlement	Type of settlement	Permanent population n total	Permanent male population in total	Permanent female population in total
Bács-Kiskun	Bajai	Sükösd	large village	3 693	1 797	1 896
		Nemesnádudvar	village	1 802	878	924
	Kalocsai	Drágszél	village	329	159	170
		Dunapataj	large village	3 169	1 548	1 621
		Dusnok	village	2 873	1 439	1 434
		Fajsz	village	1 658	816	842
		Foktő	village	1 606	769	837
		Kalocsa	town	16 959	7 924	9 035
		Öregcsertő	village	753	382	371
		Géderlak	village	983	470	513
		Bátya	village	2 023	978	1 045
		Dunaszentbenedek	village	812	383	429
		Dunatetétlen	village	530	263	267
		Hajós	town	3 134	1 470	1 664
		Harta	large village	3 275	1 593	1 682
		Ordas	village	415	188	227
		Szakmár	village	1 148	557	591
		Uszód	village	1 008	476	532
		Homokmégy	village	1 326	627	699
		Solt	town	6 285	3 007	3 278
		Miske	village	1 656	798	858
		Újtelek	village	373	175	198
	Kiskőrösi	Kiskőrös	town	14 259	6 677	7 582
		Császártöltés	village	2 323	1 090	1 233
		Kecel	town	8 687	4 102	4 585
		Akasztó	village	3 230	1 589	1 641
	Kunszentmiklósi	Dunaegyháza	village	1 504	733	771
Fejér	Dunaújvárosi	Nagykarácsony	village	1 361	670	691
		Előszállás	large village	2 186	1 092	1 094
		Daruszentmiklós	village	1 597	796	801
	Sárbogárdi	Sáregres	village	752	372	380
		Vajta	village	1 053	494	559
		Cece	large village	2 499	1 231	1 268
		Alap	village	1 925	943	982
		Alsószentiván	village	608	306	302
Tolna	Paksi	Bölcske	village	2 825	1 404	1 421
		Dunaszentgyörgy	village	2 520	1 235	1 285
		Gerjen	village	1 199	587	612
		Paks	town	19 510	9 465	10 045
		Pálfa	village	1 555	762	793
		Bikács	village	433	226	207
		Györköny	village	938	472	466
		Kajdacs	village	1 210	601	609
		Nagydorog	large village	2 618	1 274	1 344
		Németkér	village	1 688	847	841
		Pusztahencse	village	978	503	475
		Madocsa	village	1 881	884	997
		Sárszentlőrinc	village	932	431	501
		Dunaföldvár	town	8 666	4 131	4 535
	Szekszárdi	Bogyiszló	village	2 193	1 075	1 118
		Kistormás	village	331	166	165
		Tengelic	village	2 254	1 109	1 145
		Őcsény	village	2 389	1 192	1 197
		Fadd	large village	4 317	2 159	2 158
		Felsőnána	village	577	296	281
		Harc	village	901	435	466
		Kölesd	village	1 478	724	754
		Szedres	village	2 299	1 134	1 165
		Fácánkert	village	633	310	323
		Kéty	village	694	342	352
		Sióagárd	village	1 246	609	637
		Szekszárd	county town	33 311	15 334	17 977
		Tolna	town	11 367	5 407	5 960
		Zomba	village	2 047	959	1 088
		Medina	village	805	404	401

County	Micro-region	Settlement	Type of settlement	Permanent population n total	Permanent male population in total	Permanent female population in total
	Tamási	Miszla	village	272	142	130
		Nagyszékely	village	437	220	217
		Varsád	village	372	179	193
		Szakadát	village	238	105	133
		Tolnanémedi	village	1 067	503	564
		Kalaznó	village	145	82	63
		Kisszékely	village	297	138	159
		Simontornya	town	4 028	1 888	2 140
		Udvari	village	400	206	194
		Gyönk	town	2 066	952	1 114
	In total			**220 911**	**105 684**	**115 227**

Table 9.6.2-2: Population of the studied settlements broken down by genders

9.6.2.3 Residential population broken down by age group on January 1, 2012

We present the total residential population and its break down by genders for 4 age groups.

9.6.2.3.1 Total residential population broken down by age group on January 1, 2012

Micro-region	Settlement	In total				
		In total	Age group			
			0--14	15--24	25--64	65+
Baja	Sükösd	3 693	524	470	2 024	675
	Nemesnádudvar	1 802	244	233	990	335
Kalocsa	Drágszél	329	35	43	172	79
	Dunapataj	3 169	364	399	1 702	704
	Dusnok	2 873	403	345	1 645	480
	Fajsz	1 658	215	183	952	308
	Foktő	1 606	211	195	889	311
	Kalocsa	16 959	2 174	1 969	9 653	3 163
	Öregcsertő	753	61	91	438	163
	Géderlak	983	120	115	550	198
	Bátya	2 023	257	255	1 120	391
	Dunaszentbenedek	812	100	83	441	188
	Dunatetétlen	530	65	55	298	112
	Hajós	3 134	360	376	1 710	688
	Harta	3 275	369	354	1 878	674
	Ordas	415	41	47	236	91
	Szakmár	1 148	129	135	622	262
	Uszód	1 008	137	119	561	191
	Homokmégy	1 326	147	158	725	296
	Solt	6 285	806	720	3 663	1 096
	Miske	1 656	221	203	920	312
	Újtelek	373	38	38	174	123
Kiskőrös	Kiskőrös	14 259	1 906	1 632	7 980	2 741
	Császártöltés	2 323	244	228	1 285	566
	Kecel	8 687	1 245	1 106	4 701	1 635
	Akasztó	3 230	452	371	1 799	608
Kunszentmiklós	Dunaegyháza	1 504	203	202	876	223
Dunaújváros	Nagykarácsony	1 361	169	173	760	259
	Előszállás	2 186	302	345	1 161	378
	Daruszentmiklós	1 597	211	211	926	249
Sárbogárdi	Sáregres	752	110	88	400	154
	Vajta	1 053	111	236	578	128
	Cece	2 499	339	300	1 436	424
	Alap	1 925	253	237	1 066	369
	Alsószentiván	608	75	65	339	129

Micro-region	Settlement	In total				
		In total	Age group			
			0--14	15--24	25--64	65+
Paks	Bölcske	2 825	400	327	1 581	517
	Dunaszentgyörgy	2 520	354	317	1 440	409
	Gerjen	1 199	173	139	676	211
	Paks	19 510	2 677	2 527	11 434	2 872
	Pálfa	1 555	195	157	918	285
	Bikács	433	59	60	250	64
	Györköny	938	120	116	532	170
	Kajdacs	1 210	174	149	676	211
	Nagydorog	2 618	385	371	1 488	374
	Németkér	1 688	210	186	1 000	292
	Pusztahencse	978	160	132	553	133
	Madocsa	1 881	253	252	1 003	373
	Sárszentlőrinc	932	154	118	494	166
	Dunaföldvár	8 666	1 233	992	4 832	1 609
Szekszárd	Bogyiszló	2 193	327	275	1 228	363
	Kistormás	331	56	46	184	45
	Tengelic	2 254	328	264	1 202	460
	Őcsény	2 389	307	339	1 371	372
	Fadd	4 317	695	550	2 377	695
	Felsőnána	577	85	83	326	83
	Harc	901	138	151	497	115
	Kölesd	1 478	220	212	782	264
	Szedres	2 299	284	321	1 355	339
	Fácánkert	633	88	73	364	108
	Kéty	694	87	104	382	121
	Sióagárd	1 246	163	127	704	252
	Szekszárd	33 311	4 569	3 721	19 059	5 962
	Tolna	11 367	1 519	1 311	6 446	2 091
	Zomba	2 047	251	241	1 217	338
	Medina	805	114	108	445	138
Tamási	Miszla	272	24	23	145	80
	Nagyszékely	437	61	35	246	95
	Varsád	372	64	42	205	61
	Szakadát	238	28	11	119	80
	Tolnanémedi	1 067	107	77	671	212
	Kalaznó	145	24	8	77	36
	Kisszékely	297	25	19	155	98
	Simontornya	4 028	432	497	2 280	819
	Udvari	400	43	40	243	74
	Gyönk	2 066	229	289	1 053	495
In total		**220 911**	**29 456**	**26 590**	**124 680**	**40 185**

Table 9.6.2-3: Total residential population broken down by age group on January 1, 2012

9.6.2.3.2 Population broken down by gender age groups on January 1, 2012

Micro-region	Settlement	Men					Women				
		In total	Age group				In total	Age group			
			0-14	15-24	25-64	65+		0-14	15-24	25-64	65+
Baja	Sükösd	1 797	267	248	1 040	242	1 896	257	222	984	433
	Nemesnádudvar	878	119	125	514	120	924	125	108	476	215
Kalocsa	Drágszél	159	24	26	86	23	170	11	17	86	56
	Dunapataj	1 548	198	207	882	261	1 621	166	192	820	443
	Dusnok	1 439	223	205	834	177	1 434	180	140	811	303
	Fajsz	816	105	99	494	118	842	110	84	458	190
	Foktő	769	100	95	449	125	837	111	100	440	186
	Kalocsa	7 924	1 126	1 034	4 664	1 100	9 035	1 048	935	4 989	2 063
	Öregcsertő	382	29	53	236	64	371	32	38	202	99
	Géderlak	470	59	64	274	73	513	61	51	276	125
	Bátya	978	132	143	563	140	1 045	125	112	557	251
	Dunaszentbenedek	383	43	43	236	61	429	57	40	205	127
	Dunatetétlen	263	37	26	156	44	267	28	29	142	68
	Hajós	1 470	172	204	853	241	1 664	188	172	857	447

Micro-region	Settlement	Men					Women				
		In total	Age group				In total	Age group			
			0-14	15-24	25-64	65+		0-14	15-24	25-64	65+
Kalocsa	Harta	1 593	192	195	945	261	1 682	177	159	933	413
	Ordas	188	17	18	122	31	227	24	29	114	60
	Szakmár	557	69	71	321	96	591	60	64	301	166
	Uszód	476	65	52	283	76	532	72	67	278	115
	Homokmégy	627	77	81	373	96	699	70	77	352	200
	Solt	3 007	403	377	1 807	420	3 278	403	343	1 856	676
	Miske	798	107	107	473	111	858	114	96	447	201
	Újtelek	175	25	16	96	38	198	13	22	78	85
Kiskőrös	Kiskőrös	6 677	957	829	3 924	967	7 582	949	803	4 056	1 774
	Császártöltés	1 090	128	110	665	187	1 233	116	118	620	379
	Kecel	4 102	642	571	2 334	555	4 585	603	535	2 367	1 080
	Akasztó	1 589	240	193	926	230	1 641	212	178	873	378
Kunszentmiklós	Dunaegyháza	733	115	95	456	67	771	88	107	420	156
Dunaújváros	Nagykarácsony	670	93	102	389	86	691	76	71	371	173
	Előszállás	1 092	160	182	617	133	1 094	142	163	544	245
	Daruszentmiklós	796	105	112	498	81	801	106	99	428	168
Sárbogárd	Sáregres	372	56	47	218	51	380	54	41	182	103
	Vajta	494	52	118	282	42	559	59	118	296	86
	Cece	1 231	197	156	742	136	1 268	142	144	694	288
	Alap	943	128	124	534	157	982	125	113	532	212
	Alsószentiván	306	40	32	183	51	302	35	33	156	78
Paks	Bölcske	1 404	209	189	810	196	1 421	191	138	771	321
	Dunaszentgyörgy	1 235	186	173	749	127	1 285	168	144	691	282
	Gerjen	587	89	72	352	74	612	84	67	324	137
	Paks	9 465	1 356	1 410	5 630	1 069	10 045	1 321	1 117	5 804	1 803
	Pálfa	762	93	98	468	103	793	102	59	450	182
	Bikács	226	34	33	129	30	207	25	27	121	34
	Györköny	472	54	69	285	64	466	66	47	247	106
	Kajdacs	601	98	88	340	75	609	76	61	336	136
	Nagydorog	1 274	210	195	748	121	1 344	175	176	740	253
	Németkér	847	118	110	514	105	841	92	76	486	187
	Pusztahencse	503	81	73	296	53	475	79	59	257	80
	Madocsa	884	125	116	511	132	997	128	136	492	241
	Sárszentlőrinc	431	65	59	257	50	501	89	59	237	116
	Dunaföldvár	4 131	639	516	2 408	568	4 535	594	476	2 424	1 041
Szekszárd	Bogyiszló	1 075	160	139	633	143	1 118	167	136	595	220
	Kistormás	166	27	32	95	12	165	29	14	89	33
	Tengelic	1 109	169	152	616	172	1 145	159	112	586	288
	Őcsény	1 192	176	179	705	132	1 197	131	160	666	240
	Fadd	2 159	377	299	1 232	251	2 158	318	251	1 145	444
	Felsőnána	296	48	45	175	28	281	37	38	151	55
	Harc	435	67	71	253	44	466	71	80	244	71
	Kölesd	724	119	106	406	93	754	101	106	376	171
	Szedres	1 134	150	174	685	125	1 165	134	147	670	214
	Fácánkert	310	34	45	190	41	323	54	28	174	67
	Kéty	342	45	61	196	40	352	42	43	186	81
	Sióagárd	609	88	57	356	108	637	75	70	348	144
	Szekszárd	15 334	2 359	1 839	8 911	2 225	17 977	2 210	1 882	10 148	3 737
	Tolna	5 407	770	668	3 180	789	5 960	749	643	3 266	1 302
	Zomba	959	121	129	581	128	1 088	130	112	636	210
	Medina	404	68	53	229	54	401	46	55	216	84
Tamás	Miszla	142	10	20	79	33	130	14	3	66	47
	Nagyszékely	220	34	21	133	32	217	27	14	113	63
	Varsád	179	34	18	112	15	193	30	24	93	46
	Szakadát	105	15	4	55	31	133	13	7	64	49
	Tolnanémedi	503	47	44	332	80	564	60	33	339	132
	Kalaznó	82	18	2	43	19	63	6	6	34	17
	Kisszékely	138	11	16	84	27	159	14	3	71	71
	Simontornya	1 888	205	248	1 133	302	2 140	227	249	1 147	517
	Udvari	206	23	30	125	28	194	20	10	118	46
	Gyönk	952	124	151	511	166	1 114	105	138	542	329
In total		105 684	15 158	13 964	62 016	14 546	115 227	14 298	12 626	62 664	25 639

Table 9.6.2-4: Population broken down by gender age groups on January 1, 2012

9.6.2.3.3 Summary gender profile broken down by age group

	Total	Age group			
		0 - 14	15 - 24	25 - 64	65+
Total population	220 911	29 456	26 590	124 680	40 185
Man	105 684	15 158	13 964	62 016	14 546
Woman	115 227	14 298	12 626	62 664	25 639
Man – Woman balance		860	1 338	-648	-11 093

Table 9.6.2-5: Summary data broken down by age group on January 1, 2012

Based on data broken down by age groups we can state that there are more boys in the 0-14 age group, 6 % more boys in this age group than girls. In the 15-24 age group the difference is even higher (10 %). In the adult population the profile is the opposite, there are (through slightly) more women than men. However, in the 65+ age group the difference is quite significant, there are almost twice as many women than men.

9.6.3 PAKS REGION DEMOGRAPHIC STUDY - 1990-2120

This chapter studies the demographic characteristics of Paks and the settlements located in a 30 km radius (hereinafter as: Paks region) between 1990-2012, and the population forecast for 2020-2120.

Regarding the ***demographic characteristics*** of the region, we present the following:

- Profile of **demographic conditions** in Paks region between 1990-2012

  Presenting the main demographic indicators (fertility, mortality, migration), effects of these indicators onto the number and composition of population.
- **Population** of Paks region between 1990-2012

  Number and composition of population, specifically among elderlies; and changes in genders and headcount broken down by age groups.
- **Demographic characteristics** of Paks region versus national figures

  Demographic indicators, within those specifically fertility and mortality indicators versus national average figures.
- **Demographic characteristics** of Paks region for the future

  Hypotheses.

Forward-looking calculation of the population in the region contains the following:

- Residential population[1] of Paks region between 2020-2120:

  Number of residential population broken down to age groups (5-year groups).
- Demographic indicators of Paks region between 2020-2120:

  The fertility and mortality rate, and total fertility rate, life expectancy at birth and migration balance [2].
- Other demographic indicators characteristic to Paks region:

  Ageing index and dependence rate.

Analysis of demographic conditions and forward-estimate are increasingly indispensable for preparing development plans for a given area or region. To prepare such plans we need to know the initial baseline status for the population characteristics, and estimates providing quantified estimated regarding the future changes in demographic conditions are indispensable for the planning process.

1 Residential population defined by KSH: total number of persons who have permanent residence in the given area and no place of stay elsewhere, and who have place of stay in the same area
2 migration balance: the difference between the number of migrants moving to the given area and moving from this area .

One of the most important characteristics of demographic changes is that they occur on fairly long term: population changes are slow processes that take decades. This also entails for the forward-looking population calculations the degree of uncertainty during the same time horizon is usually lower than in other social-economic forward-estimates.

However, we cannot state that the population development process has long term permanent characteristics. The past two decades can also prove that these characteristics may significantly change and they indeed do change. When we try to estimate future profile of the population we have to consider these changes as well.

When the calculations were prepared as the basis for the study the final data from the 2011 population census were already available, and we used them for our study. For 2012 and 2013 we used the demographic statistics of the Central Statistical Office and based on these data we applied the population figures extrapolated from these data from the date of the population census.

On national level Hungary's population was 9 million and 938 according to data of the 2011 population census[3], i.e. since 2001 the decline was 261 000 (2.6 per cent). The reduction was due to natural decline, i.e. the fertility rate was lower than the mortality rate, and international migration could compensate only one-third of this drop during the total period. As a consequence of this migration the population was primarily concentrated onto the central part of the country, and to lesser extent onto the western region[4].

Three counties are concerned – Fejér, Tolna, Bács-Kiskun – and among them Tolna county showed a natural decline more unfavourable than the national average, and migration also caused a significant population decline. In the other two counties the population decline was around the national average.

There are 75 settlements located in Paks region, i.e. within a 30 km radius from Paks.

There are 11 cities among these settlements: Dunaföldvár, Gyönk, Hajós, Kalocsa, Kecel, Kiskőrös, Paks, Simontornya, Solt Szekszárd (county capital) and Tolna.

7 large villages: Cece, Dunapataj, Előszállás, Fadd, Harta, Nagydorog and Sükösd.

The remaining 57 settlements are villages: Akasztó, Alap, Alsószentiván, Bátya, Bikács, Bogyiszló, Bölcske, Császártöltés, Daruszentmiklós, Drágszél, Dunaegyháza, Dunapataj, Dunaszentbenedek, Dunaszentgyörgy, Dunatetétlen, Dusnok, Előszállás, Fácánkert, Fadd, Fajsz, Felsőnána, Foktő, Géderlak, Gerjen, Györköny, Harc, Harta, Homokmégy, Kajdacs, Kalaznó, Kéty, Kistormás, Kisszékely, Kölesd, Madocsa, Medina, Miske, Miszla, Nagydorog, Nagykarácsony, Nagyszékely, Nemesnádudvar, Németkér, Ordas, Őcsény, Öregcsertő, Pálfa, Pusztahencse, Sáregres, Sárszentlőrinc, Sióagárd, Sükösd, Szakadát, Szakmár, Szedres, Tengelic, Tolnanémedi, Udvari, Újtelek, Uszód, Vajta, Varsád and Zomba.

All settlements were used in the forward-looking calculation as one single area unit. The primarily reason behind was that if we break down the region onto settlements or settlement groups, then the degree of uncertainty in the forward-looking calculation can significantly increase[5]. Paks region is a "small area" regarding demographic forward-looking calculations, where the population in sub-units is relatively low, and estimation uncertainties of the small area are well-known.

9.6.4 KEY CHARACTERISTICS OF POPULATION AND DEMOGRAPHIC PROCESSES

Population is a multitude that can reproduce itself: demography is observing this reproduction process, studies and analyses the effects and consequences, and studies the intervention opportunities.

Headcount and composition by genders and age groups are the key indicators for the population living in a given area and during a given period. There might be other key indicators for the population statistics - e.g. marital status, education and qualification, economic activity, location within the area etc..

Changes occur in the headcount and composition of the population due to various demographic phenomena. The balance between fertility and mortality can influence the headcount of population (natural reproduction or decline) and

3 As of the theoretical date of the census, i.e. as of October 1, 2011.
4 2011 census. 3. National data. KSH 2013, http://www.ksh.hu/nepszamlalas/tablak_teruleti_00
5 one of the standard method here is using 5-year age groups for the calculations; but we can give estimate only for every fifth year of the forward-looking calculation period.

balance of external migrations can define it (these two together present the actual reproduction or decline). Changes in the population age structure depend on the number of new entrants (new-born infants) and the leavers in each age group (mortality by age, immigration and emigration).

A birth age-group is made of babies born at the same time (year). Any population can thus include people born over the past one hundred years (so-called birth cohort). According to principles of demography, events and results of every cohort can be traced year-by-year in changes in the population. The most important method for demographic analysis is the application and inter-connection of cross-section (i.e. year-by-year) and longitudinal (from cohort-to-cohort) approach.

Within a given year the birth rate depends on the number of woman in fertile age, their age structure and actual fertility, i.e. the frequency of birth during a given age. The mortality rate depends on the population headcount and mortality probability, i.e. the frequency of death within the given age group.

One of the most critical areas of demography is the measurement of frequency and intensity of various demographic phenomena (fertility, mortality, migration).

The fertility rate presents the total (or completed) birth rate, which is in fact the average number of children delivered by one woman during her lifetime. If we count only the girls from this figure, then we can speak about the gross reproduction coefficient.

We can describe the mortality rate with the average life expectancy at birth, i.e. the number of years potentially available for an average new-born infant, i.e. the age when this infant will most presumably die.

The simplified population reproduction is a consecutive process of "birth – survival - birth - survival -mortality". But people may also change their residence - this is called migration. The change their residence may happen within the given area unit (this is internal migration), or from a different area onto the given area (immigration) and from the given area to some other area (emigration). Type of migration can be differentiated not only by the direction of migration, but also permanent or temporary types of migration. Permanent migration means that the person settled down for good – or at least for a longer period of time – in the given area. Temporary migration is the change of residence for shorter or longer period in most cases for purposes of education or employment. Migration can be often connected to other events of the carrier (education, change of employment or workplace, establishing partnership, movements due to changes in family headcount, etc.). One of the key characteristics of migration is how often a person migrates during his lifetime (geographic mobility).

9.6.4.1 Demographic transitions

Regarding the direction of the demographic processes it is extremely significant that the given population is in which phase of the so-called demographic transition.

As described in the theory of demographic transition, there was a milestone in the 19-20th century in the global demographic processes – firstly in the so-called developed countries, and later also in the so-called developing world. The formerly high fertility and mortality rates significantly declined during a historically and relatively short period of time. This is the first demographic transition process containing several phases.

The first phase was a longer historic period prior to the transition with high mortality and high number of children. The population growth was at moderate rate, the age structure was basically young. This phase is referred to as the pre-decline period; in Hungary this process ended in the end of the 19th century.

During the second transition phase the fertility remains high but the mortality rate begins to significantly decline. As the combined effect of these two processes population growth could significantly accelerate, this is referred to as the demographic explosion. This phase was in the history when the agrarian societies started to disintegrate and the industrial societies emerged. In Hungary the period until the I. World War is regarded as the second phase of the demographic transition.

During the third phase both the fertility and mortality rates decline to very low levels. The population growth first is moderated and then significantly slows down. This is the period when the industrial society and at the same time social modernisation evolved and the traditional system of values and norms disintegrated. As a result of these demographic processes the population quickly becomes older – in demographic sense, i.e. the share of elderly is steadily increasing. In Hungary this phase was dominant until 1980.

By the end of the first demographic transition high life expectancy, low fertility, increasing number of population and older age structure were the characteristic features. However, changes can keep on arising: a new process has emerged, the so-called second demographic transition, typical for the post-industrial era. Life expectancy keeps on rising, while fertility declines lower than before. Declining population in Hungary, starting from the 1980-ies and still ongoing, can be regarded as part of this process, including the increase in the number and share of the elderly within the population.

These characteristics are general by nature; they apply not only on Hungary but also on other countries and not only the totality of the country but its parts as well. Thus we can also speak about demographic transition of population also in Paks region and this may provide a framework for outlining the future population in the region. In addition to those mentioned above, systemic change is also a critical factor, as it partly accelerated the demographic changes, and partly gave new direction to various processes.

9.6.4.2 Demographic changes in 1990 and 2000

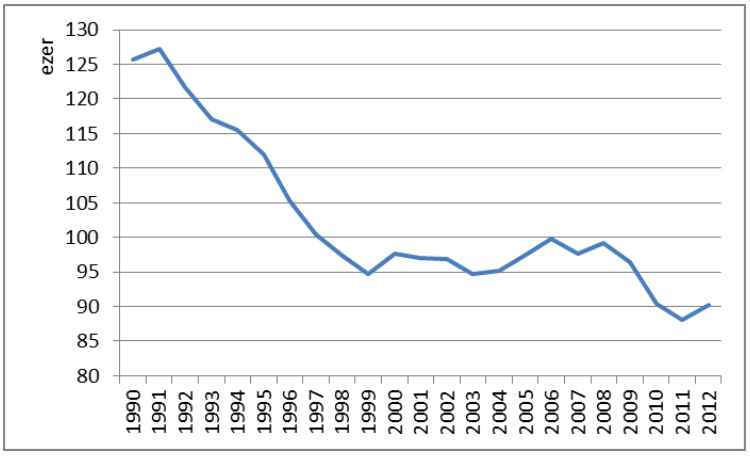
In addition to demographic transitions as the overall framework of demographic changes, there are other significant social-economic changes in every historic period that have effects also onto demographic processes. Three similar events occurred in the past three decades and they had impacts – inter alia – also onto Hungary's demographic profile: the systemic change in 1989, accession to the European Union in 2004 and the global economic crisis starting in 2008.

Initial uncertainty, differentiation in the families' position, rising unemployment and spreading poverty that emerged due to systemic change evidently had negative demographic impacts: fertility and, to some extent, life expectancy declined, number of marriage decreased, number of divorce increased, population decline become stronger.

At the same time, shift in demographic patterns has gradually evolved and expanded, demographic indicators get closer and closer to those prevailing in West-European countries also regarding to start a family, to accept motherhood and mortality.

There were significant changes also in the field of family star-up and accepting motherhood. Readiness for motherhood declined, and the age when women gave birth to the first child increased. The cross-section fertility decline could cover this shift in pattern for a while.

In 1990 only 126 000 new-born infant came to the world but since then a decline followed. The fertility rate declined accelerated from 1995, partly due to effects of the then prevailing family policy: in 1998 less than 100 000 infants were born and this number has never reached this level ever since. Since 2008 a strong decline has been prevailing, and in 2011 only 88 000 children were born. Birth rate has never been so low in Hungary – this is a historic negative record for fertility. In 2012 the birth rate increased and it was slightly higher than 90 000.



Legend:
ezer - thousand

Figure 9.6.4-1: Birth rate in Hungary - 1990-2012

Accordingly, the average number of children dropped by 1996 below the 1.5 demarcation line. The 1.28 average number of children in 1999, as a very negative figure, was repeated with similar low values in 2003 and in 2004. Then promising trends were shown for a couple of years but it was followed another sharp drop and as current data can demonstrate, 100 women would give birth in average only for 124 children throughout their lifetime. There was a birth rate growth in 2012 and could increase the total fertility rate up to 1.34; and as a result of population policy initiatives this trend might remain in place for some time.

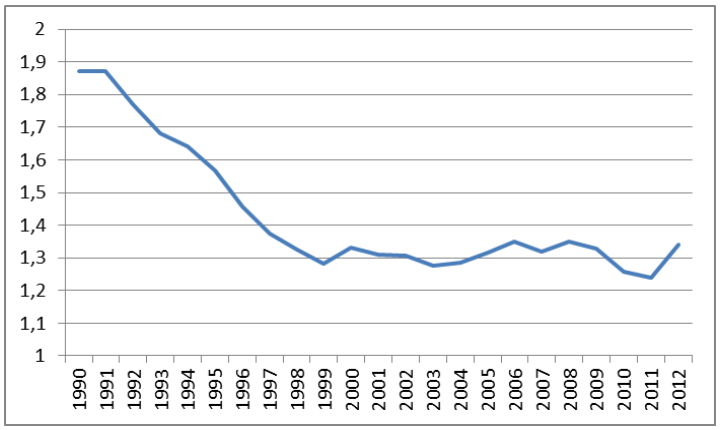


Figure 9.6.4-2: Total fertilityi rate in Hungary - 1990-2012

Parallel with this process the age structure for motherhood also changed, average age of women when they gave birth to babies significantly increased –as part of the shift in starting a family and accepting motherhood pattern. In 1990 women gave birth to their first child at the age of 23, in 2011 this age was more than 6 years higher. The average age for birth – including age of women who gave birth not only to their first but second, etc. child – in 1990 was next to 26, and in 2012 it was higher than 30. More than 20 years have elapsed since the systemic change and children born at younger ages of their mother are still missing, though some remedy could emerge if the motherhood age can be further increased (through this has of course certain biological limits).

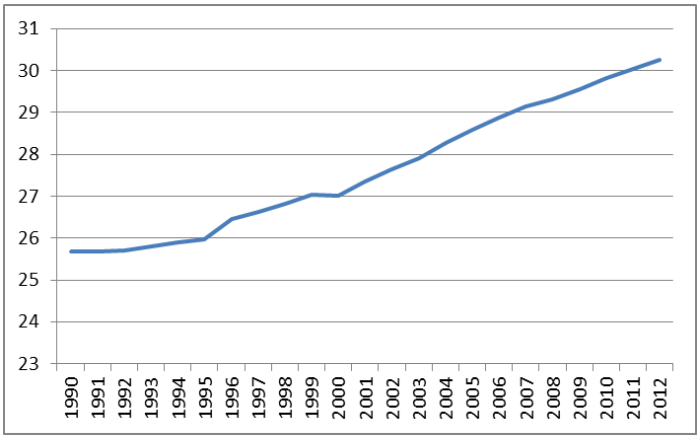


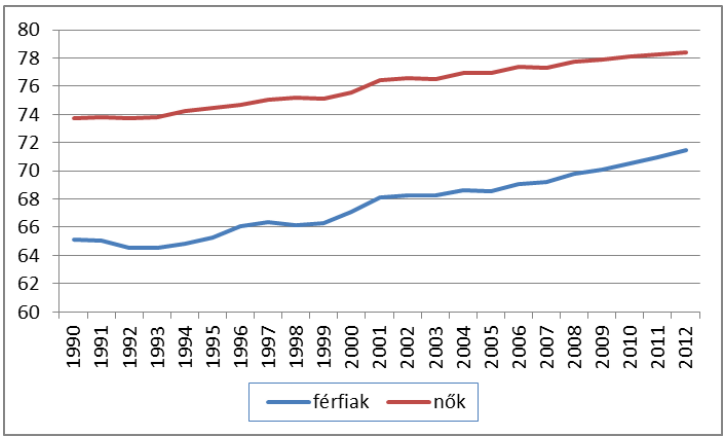
Figure 9.6.4-3: Women's average age at giving birth in Hungary - 1990-2012

So only a slow improvement can be expected in fertility and average number of children will not reach 2.1 even on long term, through this would be required for simple reproduction. Domestic and international population-forward-looking calculations[6] suggest that in 20-30 years the average number of children, depending on several factors like economic development, social welfare, family policy, may reach 1.3–1.7, but realistic expectation is around 1.5.

These tendencies vary to different extent in settlements and area units. Generally speaking, the decline in fertility is lower in village-type settlements than in the cities.

6 We can mention forward-looking calculations of KSH NKI, UN or EUROSTAT, as they present very similar future development for Hungary. World Population Prospects: The 2012 Revision; EuroPop 2010 (EUROSTAT population-forward-looking calculation)

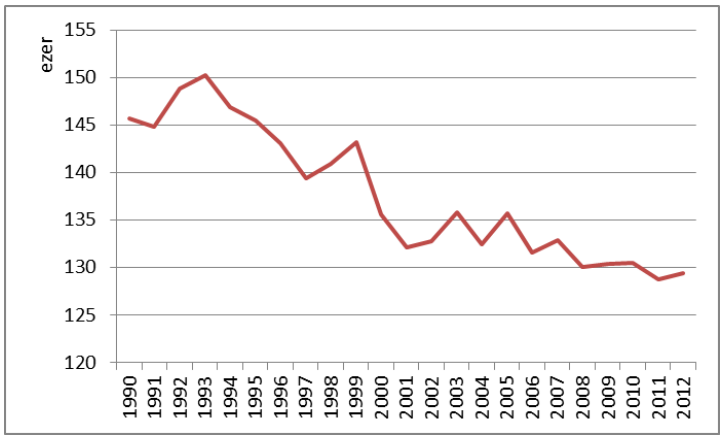
Mortality profile was quite worrisome between the systemic change and 1995. Men average life expectancy declined in 1992-1994 to 64.6 years, and middle-aged men mortality tripled versus the 1960 figure. In 1998 and 1999 life expectancy again slightly declined. Since 2000 life expectancy has increased every year to some extent, and it reached 71.5 for men and 78.4 for women. The gap between the life expectancy figures of the two genders has been slowly declining, but is still quite significant.



Legend:
Férfiak – men
Nők – women

Figure 9.6.4-4: Average life expectancy at birth of men and women in Hungary - 1990-2012

Mortality rate followed the changes in life expectancy. From 1996 the former annual death toll (nearly 150 000) declined to 144 000, and this declining trend continues also in 1997, primarily improving the men's rate. In 1998 and 1999 the number of death again increased and life expectancy slightly declined. Since 2000 life expectancy has increased every year to various extents. Since the beginning of 2000 the number of death has been showing a declining trend, through with some volatility, and in 2011 and in 2012 it was slightly below 130 000.



Legend:
ezer - thousand

Figure 9.6.4-5: Mortality rate in Hungary - 1990-2012

This means that a new mortality trend will evolve leading to significantly growing life expectancy.

Regarding domestic migration rates, number of movements dropped after the systemic change and a sub-urbanisation process emerged. More and more people moved to settlements around the cities rather than to downtown zones. This was reflected in statistics that the former village-city direction turned to reverse, and in 1990 migration gain of villages grew, and cities suffered migration losses. A new turn occurred in 2006-2007, when migration loss for cities – mainly Budapest – was eliminated and the negative migration balance hit the villages. Domestic migration is primarily from east to and towards central parts of the country. Primarily young men migrate, but the migration trend significantly declines above 40 years of age.

Increasing international migration was quite characteristic during the systemic change period but this was also and partly due to the refugees escaping from the war zones in former Yugoslavia. The following milestone was Hungary's accession to the EU in 2004 as it fuelled the migration process, but primarily into Hungary and emigration from Hungary was mush less than expected. The later became stronger driven by the global economic crisis from 2008, whereas immigrants from the neighbouring countries looked at Hungary only as a transit country or springboard. In such a situation no significant international migration gain can be expected.

9.6.4.3 Demographic profile of Paks region from 1990

In the following section we overlook demographic data and tendencies observed in Paks region during the past two decades.

In Paks region 2.4% of Hungary's population lived in 1990 and 2001, based on the population census. The headcount of the residential population was 244 000 in 1990 and 243 000 in 2001, almost the same as registered in the two censuses. After 2001 the region's population was 221 000 in 2012, thus during the decade there was a 22 000 decline. This decline was the consequence of partly a natural decline and partly the negative migration balance. In summary, between 1990 and 2012 there was a 23 000 population decline, representing a 9.4 per cent decline. The country's population declined by 4.2 per cent at the same time. Consequently, in Paks region the population decline was twice higher than the national average.

There are 11 cities located in the region. The city-village population ratio in 1990 was 56.4 per cent, in 2001 it was 57.3 and in 2012 it was 58.1 per cent. This means that the rate of urban population has been – through at a slow rate – increasing in the region. In 1990 there were 138 000 people living in cities, and in 2001 the headcount was quite similar (139 000), but in 2012 urban population was only 128 000 – thus in the last decade more than 10 000 people was the decline in people living in cities. There were 106 000 people living in villages in 1990, and the number of this population declined by 3 000 by 2001. At the beginning of 2012 another 10 000 decline occurred, and as a consequence we can now find 93 000 people living in villages in Paks region.

Between 1990-2012 the rate of population decline was higher than 10 per cent in Hajós and Simontornya among the villages and cities. During the same period the rate of population decline was between 5-10 per cent in Gyönk, Solt, Szekszárd, Tolna and Kalocsa. A more moderate population decline rate (lower than 5 per cent) could be detected at Dunaföldvár, Kecel, Kiskőrös and Paks. Among settlements having more than 10 000 habitants the rate of population decline was the lowest in Kiskőrös and Paks, in case of Kalocsa and Tolna this rate was around 6-8 per cent, and among cities the highest rate of population decline was found in Szekszárd, the largest city in Paks region, this rate was very close to 10 per cent. In summary, residential population of cities declined by nearly 7 per cent, whereas population of villages dropped by almost 13 per cent during the two decades.

Fertility, mortality and migration rates can define changes in the headcount of population. The population age structure is one of the main components of changes (number of births is higher within younger population, while mortality is higher in the elderly population), and the other key factor is the intensity of the relevant demographic phenomena (fertility, mortality, migration).

9.6.4.3.1 Fertility profile

There was a major fertility decline between 1990-2011 in Hungary and as a consequence of this process, both readiness for motherhood and the rate of live birth are at present at historic bottom. The total fertility rate in Paks region in 1990 was still 2.05, which was significantly higher than the then prevailing national average (1.87). However, in 1996 the fertility rate declined and fee below the national average and in 2001 it was only 1.28 (the national average was 1.31). The fertility rate in Paks region remained higher than the national average until 2011 – except one year in 2008. In 2011 this rate in the region was 1.2, and this means that 100 women gave birth only to 120 children during their lifetime – consequently 90 per cent of women living in the region should give birth to more than one child in order that the simple reproduction (that means an average number of children around 2.1) can be secured.

Total 49 000 children were born in Paks region between 1990-2011, representing 2 250 birth cases as an annual average. During the first part of this period, i.e. between 1990 and 2000 significantly more children were born (as annual average 2 500 children), but from 2001 this number significantly declined (average 2 000 children/year, but last year the birth rate was only around 1 700).

The birth rate dropped when the high-headcount age groups (born in 1970) just entered to their 20ies. Formerly a fertility pattern could be identified in Hungary and all over East-Europe, i.e. women gave birth to babies at relatively young age, so this should have been reflected also in growing number of new-born children. But this did not happen moreover the birth rate kept on declining as a clear indication of dropping readiness for motherhood. If this tendency remains it is quite a good reason for serious headache, because there is no indication that the birth cancelled at younger age can be made up later, after the age of 30.

This is why we can clearly see an increase in the women's birth age. The average birth age in the entire region was in 1990 only around 25 years, whereas in 2000 it was already 27 and in 2011 as high as 29 years. This phenomenon can be interpreted as the women's decision to postpone the time for motherhood. As far as the future is concerned the key issue is to what extent and when will parents make up – if they can make it up at all – the gap caused by children who did not born in the past decades.

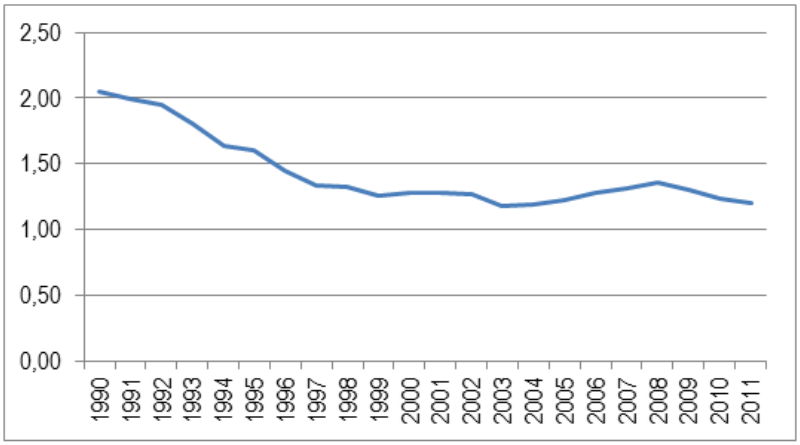


Figure 9.6.4-6: Total fertilityi rate in Paks region - 1990-2011

Knowledge of past tendencies may offer the basis for preparing assumptions for future tendencies. A hypothesis for the fertility of a regional forward-looking calculation may be based on the assumption that the regional trend follows the pre-calculated curve of the national average[7]. The basic hypothesis for the fertility of national forward-looking calculations assumes a gradual increase in the number of children by 2030. Based on this an increase slightly higher than 0.1 would occur in the fertility rate as the average in Balaton region by 2020 (10 per cent of women agree to give birth to more than one child), and then the number of children would increase up to 1.45 by 2030, and would remain at this rate until the end of the forward-looking calculation period. Thus we can see a shift in fertility pattern and its pre-calculated run-out behind this hypothesis. The said shift in pattern began in the second half of 1980, and its main essence is to postpone the age for the first marriage, and consequently, the age of motherhood.

9.6.4.3.2 Mortality profile

Mortality in Hungary showed a tendency unique worldwide during the past 40-50 years. One of the fundamental characteristics of the demographic transformation in the 20th century is the robust increase in life expectancy, but in Hungary this indicator was rather stagnating and declining. At the beginning of the nineties the mortality rate has significantly deteriorated driven by effects of the systemic change. Life expectancy at birth for men was 64,8 years on national level between 1990-1995, and this was 8-10 years lower than the same rate in the developed European countries, and women will still die 6-8 years earlier than in West Europe. Mortality rate of infants and children kept on improving, but the mortality risk of middle-aged men increased by two or three times. There is a trend of improvement after the end of the 90ies, at the beginning at a faster, then at a slower rate, but mortality rate is still the most unfavourable for the middle-aged men.

General mortality trend in Paks region is similar to national trends and its volatility is around the national average data. Between 1990-2011 nearly 72 000 people died so the annual average number of deaths was-3300. Between 1990-2001

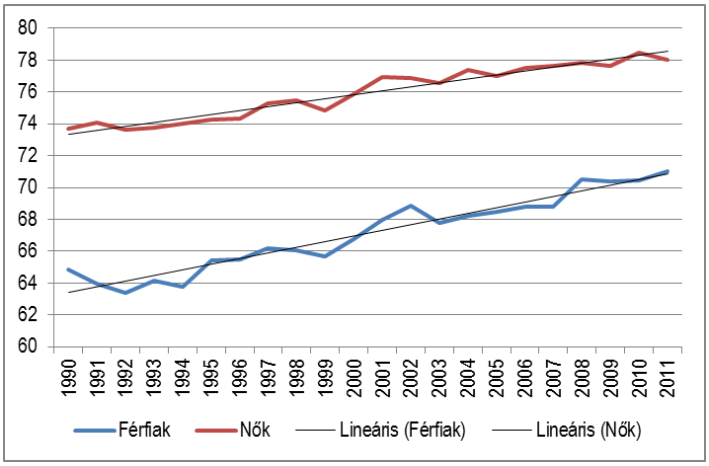
7 The 2012 forward-looking calculation provides the national framework for the forward-looking calculation of the area. See e.g. Földházi (2012) or www.demografia.hu

nearly 38 000 people died in the region so the annual average number of deaths is 3400. This figure declined between 2001-2011 period to 34 000 thus the annual average number of deaths significantly dropped to 3100. Based on the above figures we may come to the conclusion that mortality indicators improved but we cannot be sure until we can eliminate the effect of the age structure.

In demography we use indicators for the mortality level and profile – just like in other phenomena as well – and these indicators are independent of the age structure of the given population. Regarding mortality this means that we analyse the average life expectancy at birth.[8]

As men and women have different mortality indicators it is useful to calculate life expectancy separately for each gender. In 1990 men life expectancy was 64.9 years in Paks region, whereas for women almost 9 years higher (73.7). Ten years later in 2001 men life expectancy grew with almost two years up to 66.7 , while for women it was more than two years higher: 75.9 . During this period the difference between men and women life expectancy increased, though only indeed very slightly. By 2011 men life expectancy jumped high up to 71 years, whereas for women the improvement remained gradual and resulted in „only" two years improvement, i.e. 78 years. As a result of these processes the difference between men and women life expectancy was moderated during the two decades between 1990-2011 from the initial 9 to 7 years.

Changes described above emerged due to various degree of volatility but in summary we may state that life expectancy at birth has significantly increased for both genders during the studied period, moreover life expectancy rates for men and women life have got closer to each other.



Legend:
Férfiak – men
Nők – women
Lineáris (férfiak) – linear (men)
Lineáris (nők) – linear (women)

Figure 9.6.4-7: Life expectancy at birth of men and women and its linear trends in Paks region, 1990-2011

Changes presented here in life expectancy at birth evolve, of course, from different characteristics prevailing in various settlement s in the region. Mortality data in settlements with relatively low population headcount are of course more uncertain than national data or data relevant for larger regions. As presented above, there are very few settlements among the cities in Paks region that have higher than 10 000 population, thus we did not calculated indicators relevant for areas smaller than the total region.

The mortality hypothesis for the region can be prepared using the method similar to the one applied for the fertility hypothesis: mortality follows the national tendency, which assumes a continuous and significant mortality decline both for men and women until 2120. As this hypothesis predicts, in 2070 the life expectancy at birth will reach 84.8 (for men) and 90 (for women). During the next 50 years life expectancy will continue to increase and life expectancy for men and women will get closer, thus for men it will be 94.3 and for women 97.8 years.

8 Life expectancy at birth (e_0^0) gives an estimate for the number of average years expected for new-born infants under the current conditions through applying the mortality probabilities broken to the age monitored in a given year.

9.6.4.3.3 Migration, natural and actual reproduction

Former and current difficulties for preparing domestic (and international) migration statistics are well known and they can cause uncertainties for monitoring the process. However, it seems quite sure that intensity of domestic migration declined in the first half of 1990, and direction of migration also changed quite often and thus villages were the winners of migration processes. However, from the middle of 2000 a new turn occurred in migration direction: migration loss of Budapest and major cities ceased and migration balance became negative for the villages. The migration volume – i.e. the number of migrants – jumped up in 2007, however then it again declined due to the economic crisis and did not remain high for long. Number of permanent migrants has been continuously declining since 2007, and the rate was only little higher than the lowest measured in 1991. Temporary migrations show a higher volatility, in 2008 there was a major decline and then again some increase.

We wish to call the attention that there were further uncertainties causing problems in 1990 to domestic migration data and these could partly remain also in 2000. Firstly, registrations are very often ignored as there is practically no control. The 2001 population census identified masses of people who were living in places other than their registered residence. Secondly, the registers are also incomplete, for example the registration forms do not contain the old only the new address thus we cannot know the two settlements involved in the migration. It is also known that people tend to move from a given settlement without registering out from the old (not live) address. The usually way of management is that the persons registered onto obviously "dead" temporary addresses are "re-registered" to their permanent addresses. This will, of course, affect also the data source we used: at certain points there is no strict harmony between the number of populations and demography otherwise typical for demography.

Registering international migration is also quite difficult. We have much more and more reliable information about the migrants than people who leave the country. Their actual headcount can be realistically estimated using the mirror statistics of the recipient countries or preparing an inventory with the help of data from various population censuses. Data from the 2011 population census can demonstrate that data obtained from extrapolation of demographic statistics and the actual population census van show only a minimum difference (the difference is only 14 000 people, versus the figure of the 2001 population census, i.e. 200 000 people gain). This suggests that international migration could be counted during the period between the last two population censuses. However we can say that international migration primarily hits Budapest and the major cities and the settlements located near the country borders thus it has no major role in changing population in Paks region.

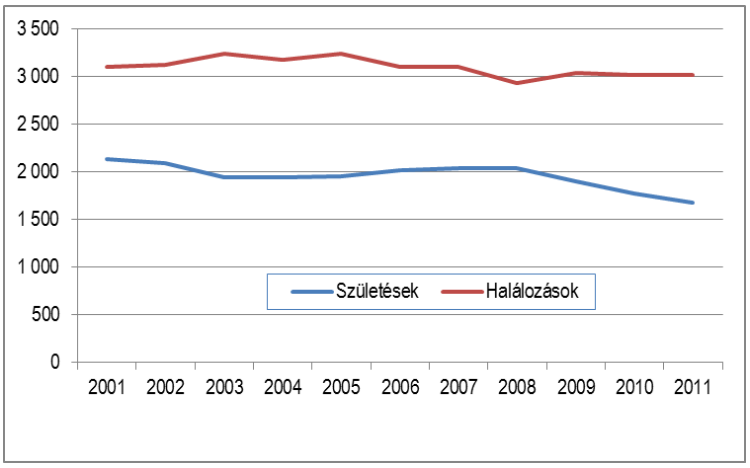
Accuracy of domestic migration data can be confirmed when the detailed data of the population census are available - they are not yet published. But we can know that settlements located with a 30 km radius from Paks are situated in the area of three counties, and there was no significant emigration from two of them – Tolna and Bács-Kiskun county. These two counties contain 67 out of 75 settlements in Paks region. Fejér county has 8 settlements belonging to Paks region, and we know that the total population of the county did not decline.

Regarding Paks region we analyse population changes triggered by migration using a compact indicator, the so-called migration balance (this contains the difference between the total number of immigrants moving into the region and the emigrants leaving the region). It seems evident that during the last decade the migration loss was somewhat typical in the region, through this loss has been mitigated in the past few years. Between 2001-2011 the migration balance was negative in almost every year for the total region. Prior to 2003 the balance was positive in the villages, but from 2003 it turned to negative through the rate was lower than the migration loss of the cities. After 2007 migration loss of villages was higher than the number of emigrants leaving the cities, but it again turned back by 2011. The highest migration loss in the region during this period occurred in 2008 - nearly 1600 people.

Negative sign was the typical for natural reproduction (i.e. the balance between fertility and mortality) both in the region as well as in the country. The population of the region is relatively elderly and the number of children is low, thus the number of birth is lower than the number of death.

In Paks region the number of death was 12,500 higher than the number of birth in the past decade. This means that the region suffered nearly 5 % loss in its population in natural reproduction. The primary reason is the decline in the number of birth.

The actual reproduction, thus the number of actual population also containing the negative effect of changes in the migration in the region, and the number of the residential population is declining. This decline in total Paks region was 19,500 people, i.e. 8% of the population.



Legend:
Születések – fertility
Halálozások – mortality

Figure 9.6.4-8: Fertility and mortality in Paks region, 2001-2011

This can be summarised that the combined effect of the three components of demographic changes – we believe – shall point toward leverage on long term. We assume that fertility would be gradually consolidated and mortality would continue improving on long term.

We define the migration hypothesis based on the above starting point. Based on the migration balance in 2007-2011, we assume the by 2020 a migration balance would evolve that can help tendencies prevailing during this period to continue. Depending how long the improving trend of the balance of migration can remain in place and with what intensity, we developed three hypotheses. The base case assumes that improvement can reach a slightly positive level, i.e. resulting as an annual average 100 people migration gain. The low case predicts a steady emigration from the region, 100 people migration loss as the annual average. The high case expects a 200 people migration gain as annual average, somewhat higher than in the base case.

Migration processes are less predictable than fertility and mortality as they mostly follow the standards of population development. This is exactly why migration hypotheses – particularly in a long time horizon as in the present calculations – should be interpreted as indicators for the case that would have emerged if a migration tendency with a given direction had remained in place for long.

9.6.4.3.4 Age structure of the population

The age structure is one of the key indicators of the population. We usually refer to age structure in two aspects: first we analyse the size (headcount) of population in various ages and age groups, and secondly we study the share of this headcount within the total population.

Two processes should be simultaneously considered how they can have impacts on the age structure. The first such process is ageing, i.e. the increasing rate of elderly population, and the declining rate of young generations. This is the combined consequence of the demographic transition, i.e. higher life expectancy and lower birth rate, which might be modified by migration effects. The other process is the volatility mostly connected to ups and downs in the past birth rates (wars, crises, demography policy impacts). As the new generation with variable headcount go through the age pyramid they continuously develop an irregular age structure.

At the beginning of 1990 population of Paks region counted 244 000 people, among them 69 000 was in the 0-19, 143 000 in the 20-64 and 32 000 in the +65 age group. These headcount numbers represented 28.2, 58.7 and 13.1 % of the total population, respectively. The average age, as the indicator of the ageing level of the total population [9] was 37.2 years at the beginning of the said decade.

9 Average age weighted with the number of population in the relevant age group

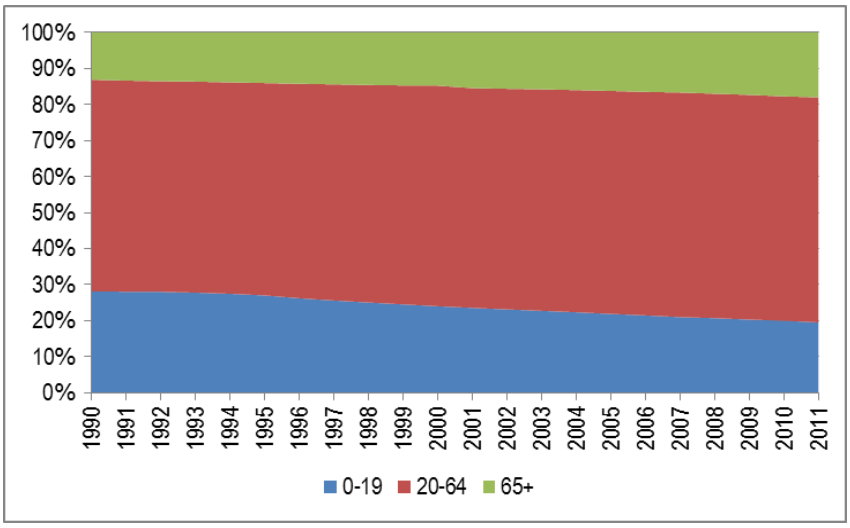


Figure 9.6.4-9: Changes in the population age structure in Paks region - 1990-2011

The decade caused significant changes in the age structure. Share of young generations significantly declined: in 2001 the 0–19 age group represented 23.6 per cent of the total population, and in 2011 only 19.5 per cent. The headcount also dropped heavily: in 2001 there were 57 000, in 2011 only 44 000 people in this age group. Share of the 20–64 age group increased up to 61 per cent by 2001, and the headcount grew to 148 000. By 2011 this headcount figure decline to 139 000 but the share within the total population increased up to 62.5 per cent. The number of "elderly" people (+65) also increased: in 2001 the headcount was 37 000, and the share 15.4 per cent, by 2011 40 000 and 18 per cent, as a consequence of improving mortality rate and gradual departure of smaller headcount generations born during the first World War. All-in-all, the average age of the population increased by 2.2 years by 2001 and reached 39.4 years; and by 2011 this indicator grew to 42.4 years.

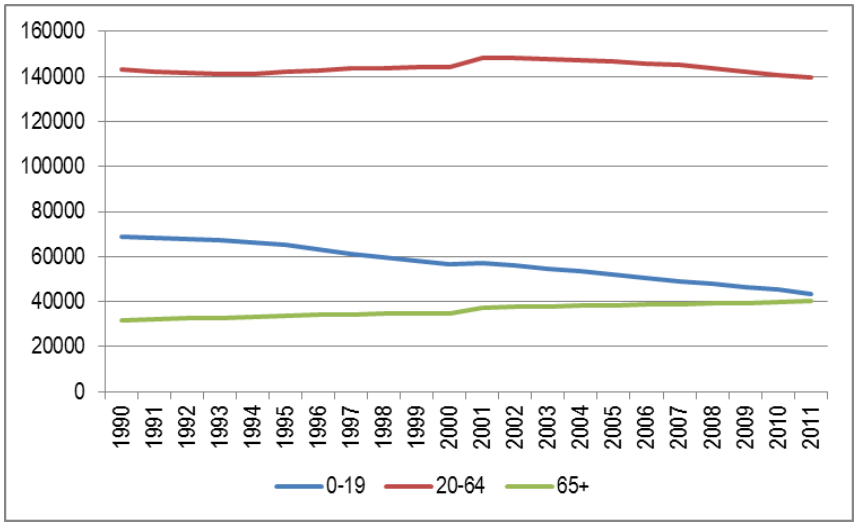


Figure 9.6.4-10: Changes in headcount of various age groups in Paks region - 1990-2011

Age structure can usually change at a slow rate thus movements with short interval may lead to quote significant changes. Impacts of the repeatedly declining number of children, still high mortality of the middle-aged and changes in headcount of various cohorts and age groups can, of course, be identified in these changes. The ageing process goes on in the population and it indicates that a new demographic process is going to evolve: the so-called second demographic transition. The most characteristic features of this process are: low number of children, significantly improving life expectancy, ageing process and an immigration replenishing the declining headcount.

There is no need for describing specific assumptions for changes in the age structure when forward-looking calculations are prepared for the population, because hypotheses generated for the fertility and mortality can almost automatically offer conclusions for changes in the age structure, as a result of dynamically presenting the laws in the demographic processes. Based on the results we can have a chance for monitoring these changes in full details.

9.6.5 METHODS, INPUT DATA AND HYPOTHESES FOR FORWARD-LOOKING CALCULATION OF POPULATION

9.6.5.1 Forward-looking calculation of local population in Hungary

Demography-based forward-looking calculations of the local populations have been prepared in Hungary as early as since the beginning of the 1960-ies.

Based on data gained from various population censuses, the regional demographic-population pre-calculating experts of the Central Statistical Office Demographic Research Institute prepared county-level forward-looking calculations. The forward-looking calculations prepared in 1980 were exceptions, as in this the counties were broken down to three sub-divisions: county capital, other cities of the county total and villages of the county total, i.e. on 57 local units on national level.

The demography-based forward-looking calculation of the population means that a detailed forward-looking estimate is prepared for the population: results of this calculation present not only the total population headcount, but also the men and women breakdown, and within that the break down for various age groups. Further, the estimate covers also the components of changes: predicted movements in fertility, mortality and migration, i.e. the forward-looking calculations of population contain each of the fundamental demographic indicators and characteristics.

These forward-looking calculations of the population were prepared using the so-called cohort-component method, recommended by the UN. They not simply project the number of population for a given area unit applying some methods, but they regularly extrapolate the population headcount broken down to genders and age groups based on the relevant reproduction processes (fertility, mortality, migration). This process is extremely labour and computer intensive, but can offer several benefits versus the less detailed methods: firstly it can provide an appropriate information basis for preparing regional demographic studies covering the future, and secondly it is able to secure very high level of accuracy, as proved by experiences.

The scope or content of such forward-looking calculations of the population is the following:

- Residential population:
    - ✓ combined high-priority age groups:
        - 0–19: juvenile,
        - 20–64: working age,
        - +65: elderly.
    - ✓ For January 1, 2013. 1. – January 1, 2120.
    - ✓ in three forward-looking calculation versions: *base case, low case, high case*
- Demography:
    - ✓ live birth rate
    - ✓ mortality
    - ✓ number of migrants
    - ✓ between 2012-2019
    - ✓ in three forward-looking calculation versions: base case, low case, high case
- Hypotheses:
    - ✓ average number of children (total fertility rate)
    - ✓ boys birth rate
    - ✓ men and women average life expectancy at birth
    - ✓ balance of migration
    - ✓ between 2012-2019

9.6.5.1.1 Input data for -forward-looking calculation of population

Forward-looking calculations cover residential population and it starts from residential population extrapolated for 2011 using birth, mortality and migration statistics obtained from 2001 population census.

We also used the data warehouse of the Central Statistical Office, where we analysed population and migration data for 1990 and 2000 in line with the above breakdown. The first part of the study (Section 9.6.4.3) contains the relevant results, and these results were used also as the kick-off status for preparing the hypotheses as the basis for the forward-looking calculation.

We have the following input data:

- Residential population:

  number of residential population broken down to genders and age groups between January 1, 1990 – January 1, 2012

  between the two population censuses extrapolated using the relevant demographic statistics

- Demography:

  live birth rate between 1990-2011 broken down to calendar years, gender of children and age of the mother

  mortality between 1990-2011 broken down to calendar years, gender and year of birth

  migration between 1990-2011 broken down to gender, age and migration type (immigration - emigration, permanent migration – temporary migration, domestic-international migration)

9.6.5.1.2 Hypotheses for forward-looking calculation of population

When hypotheses for forward-looking calculations were prepared we started from the fact that the region between 1990-2011 the region followed the national average in main trends but showed certain deviations.

The fertility hypothesis applies on the total fertility rate (average number of children), and we defined the mortality hypothesis based on the average life expectancy at birth and the migration hypothesis using the balance of migration. Using the relevant methods (to be described in details later) we broke down the main hypotheses to ratios and probabilities by age. These ratios and probabilities provide the basis for the regular forward-looking calculation broken down by population age.

The basic hypothesis of the regional forward-looking calculation for fertility is that the region can (as a trend) follow the pre-calculated changes in the national average[10]. The basic hypothesis of the national forward-looking calculations for fertility assumes a steady increase in the number of children for 2030, when the number of children can reach 1.5, i.e. when 100 women give birth to 150 children during their lifetime. As the average in Paks region we calculate with a fertility rate 0.05 lower, also considering the former deviation versus the national fertility rate between 1990-2011. This means that in Paks region an average 0.1 growth will occur in the fertility rate by the end of 2010(10 % of women will give birth to more than one child) and then the number of children will grow by 2030 and reach 1,45, and will remain at this rate until the end of the forward-looking calculation period. The low case hypothesis assumes only a minimum growth in the current fertility rate and expects only maximum 1.25 from the end of 2010. The high case is only "conservatively optimistic", and assumes 1.65 fertility rate, and has the view that this will be reached only after a slow and long term increase by the middle of the 2030-ies.

The basic mortality hypothesis was developed using the logic of fertility hypothesis: the mortality will follow the national core tendency that assumes a continuous mortality decline both for men and women until 2120. Neither men nor women life expectancy rates showed a definite deviation versus the national average in Paks region between 1990-2011, as it had slight volatility around the national average. Thus we assume that life expectancy can in average follow the national trend in the region. As described in the national hypothesis, in 50 years life expectancy at birth will reach for men 82.6 and for women 88.1 years. At the end of the period the respective values will be 94.3 and 97.8 years. We assume that the difference between men and women life expectancy rates can slightly but gradually mitigated. In the low case

10 The 2012 forward-looking calculation provides the national framework for the forward-looking calculation of the area. See: [9.6-2]

hypothesis life expectancy for men and women will reach a similar value only by the end of the forward-looking calculation period, like in the base hypothesis during the first 50 years: the low hypothesis assumes for men 83.9 and for women 89.8 years by 2120. The high case envisages a strong and significant growth in life expectancy, and as a result both men and women life expectancy rates will be higher than 100 years by the end of the period (for men 103.7 and for women 105.5 years). This growth rate can be reached only if several conditions change very favourably (e.g. significant developments in the quality and capacity of various medical or healthcare systems).

We defined three assumptions also for the migration, and these hypotheses apply on the balance of migration (i.e. the difference between the domestic and international migration rates estimated with the relevant immigration and emigration data). We used the 2001-2011 period as the basis for estimation due to reasons already described when we analysed the former migration processes. We assumed that the trend showing declining migration losses in the past few years will continue and the difference among the three versions was in the duration and intensity of this tendency. As the base hypothesis assumes the balance of migration would be positive by the end of 2010, i.e. the migration gain would be somewhat higher than the migration loss – minimum 100 people per annum. For the subsequent period we assumed consolidation in this balance of migration. In the low case we assumed that though migration loss would decline, but remain negative in a minor extent. Thus we calculated with a migration loss of 100 people from the end of 2010. The high case assumed, similarly to the base case, a migration gain of 200 people per annum.

When we prepared the migration hypotheses uncertain, sometimes contradictory migration data caused some difficulties. Final data of the 2011 population census (which are not yet available) i.e. final results of the migration processes will allow us to form a more accurate opinion about the migration processes of the past few years. It is essential to clearly see that while population age structure and fertility and mortality indicators typical for the given population (which change only at very slow rate) can basically define fertility and mortality also on long term, on other hand changes arising from migration in most cases occur eventually or with ad hoc character in a given population, and they may cause significant changes even within relatively short span of time.

Based on the above, we generated three forward-looking calculation versions: base, low and high cases. Each of these versions was prepared through combined application of the relevant hypotheses, thus the base case was built on a core hypothesis for fertility, mortality and migration, whereas in the high case we used the high values of the relevant components. So the base case can be regarded as the “realistic” version describing the most probable population development on medium term. The low case assumes a balance combined from low fertility, high mortality and negative migration, consequently it can be regarded as the pessimistic version. The high case describes an optimistic future. On long term results of the forward-looking calculation can show how the population would change if conditions presented in the relevant hypotheses are fulfilled.

For forming opinion for short term population development using the base case is the best.

In the following section we present a quantified summary for the hypotheses.

Average number of children

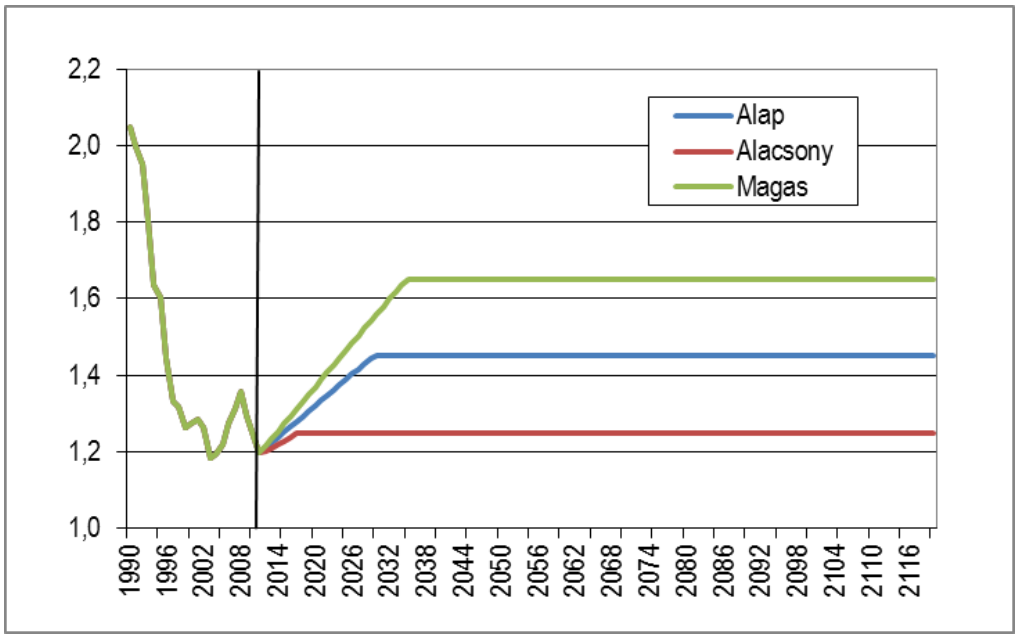
Average number of children is the number of children born by one woman during her lifetime[11] and its initial value in 2011 was 1.20 assuming gradual changes in the mid 2020-ies

- low rate: 1.25
- medium rate: 1.39
- high rate: 1.47

Final value for average number of children in 2120

- low rate 1.25
- medium rate 1.45
- high rate 1.65

11 In the professional literature we usually use the English term: Total Fertility Rate, TFR



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-1: Total fertility rate in Paks region and hypotheses for forward-looking calculation versions, 1990-2120

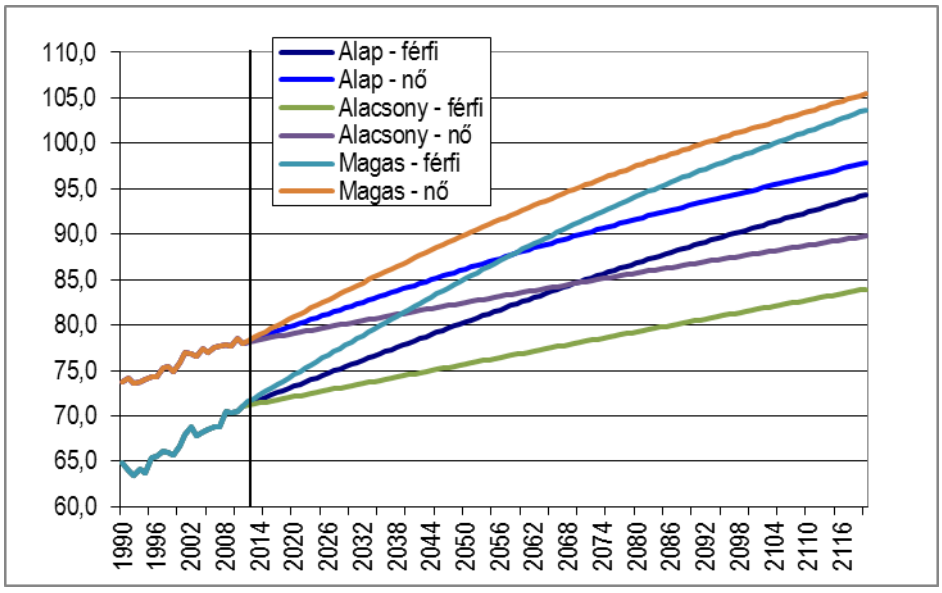
Average life expectancy at birth

Life expectancy for new-born infants in 2011 for men was 71.4 and for women 78.5 years. As a result of gradual changes in 2060

- *low* rate for men 76.9, for women 83.6 years,
- *medium* rate 82.6 and 88,1 years,
- *high* rate 88.3 and 92.6 years,

while final figures in 2120

- *low* rate for men 83.9, for women 89.8 years,
- *medium* rate 94.3 and 97.8 years,
- *high* rate 103.7 and 105.5 years.



Legend: alap base– line, alacsony – low, magas – high, férfi – men, nő – women

Figure 9.6.5-2 Average life expectancy at birth in Paks region and hypotheses for forward-looking calculation versions, 1990-2120

Balance of external migration

Initial figure for net migration estimated for 2011: -655 people.

Annual balance of migration until 2020

- low case growing to -100 people, then unchanged,
- medium case growing to +100 people, then unchanged,
- high case growing to +200 people, then remains at this level until 2120.

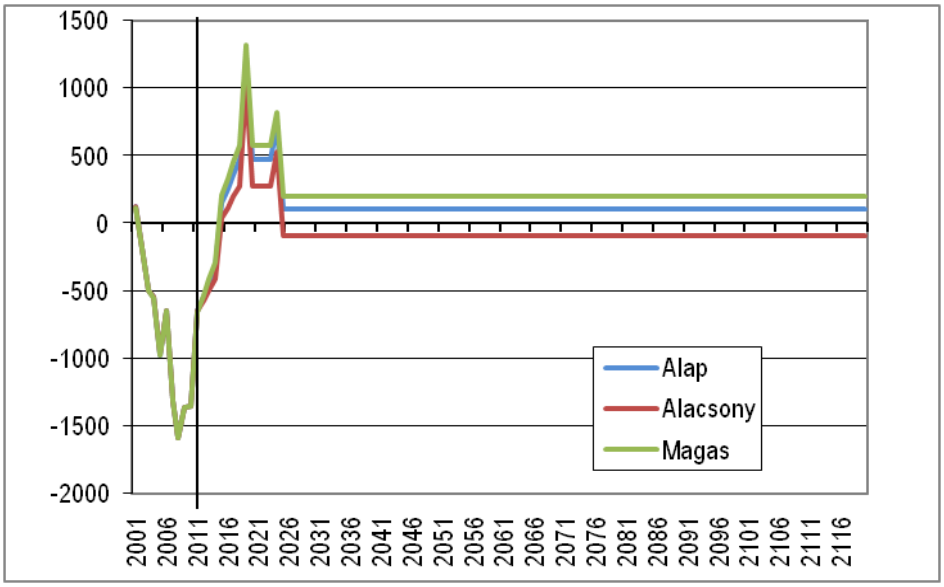
Balance figures broken down by gender from 2020 will be identical in every hypothesis.

Every migration hypotheses is supplemented with the assumption that estimates the expected manpower demand for the construction and operation of the planned new units in the power plant. Firstly, construction of the power plant would need (as per estimates) 5000-7000 workers. Regarding migration, we have to calculate only those people who will come from regions beyond the study area and get employment or settle down at Paks or within a 30 km radius. We assume that nearly half of the required manpower would come from "outside", i.e. approximately 3000 people. Some of them would not come alone but with minimum one family member – the presumption is that 25 % of the migrants would bring also one family member, and this would typically be the wife, because most of the migrants and people looking for jobs at construction projects are young or maximum middle-aged men. Thus we estimate a 70-30% rate for men-women, and the age of migrants as between 25 and 40 years. During the construction phase nearly 3750 people would move in to the region.

We can have similar concepts regarding the staff required for the operation of the new units of the power plant. One-one unit will require nearly 700 employees, thus simultaneous operation of two units would need an additional 300 employees. We assume that 80 % of them would migrate from regions beyond the given area – as this type of work requires significantly higher-level expertise than construction, and it is less likely that Paks and its direct environment can provide experts with acceptable qualification in the required number. The assumptions used for family members, men-women rates and age limits for construction can be also used for the operation phase. Thus some 800 people migrating from “outside” would be required for the operation, and with family members the total headcount would be 1000.

So we expect a total 3800 migrants and 25 per cent of them would bring minimum one family member, i.e. total 4750 migration gain in Paks region. We assume 380 people would settle down per annum during the 10 years of construction – this includes workers on the construction and their family members. During one-one year prior to the planned commissioning date of the two new units manpower will be recruited and gradually put to work, thus we assumed that these will be the years when a major and a minor “immigration wave” would most probably occur.

This positive migration balance as estimated above was "added" to the migration balance originally assumed in the migration hypotheses, and thus we could get the actual hypotheses we applied for the calculations. The figure can clearly present the migration gain and its distribution.



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-3: Balance of external migrations in Paks region and hypotheses for forward-looking calculation versions - 2001-2120

9.6.5.2 Population-forward-looking calculation versions

Three versions for forward-looking calculation are developed using the following system of hypothesis:

Base case:

- medium fertility hypothesis: total fertility rate: 1.45
- medium mortality hypothesis: life expectancy at birth for men: 94.3; for women: 97.8 years
- medium migration hypothesis: annual average 100 people migration gain

Low case:

- low fertility hypothesis: total fertility rate: 1.25
- low mortality hypothesis: life expectancy at birth for men: 83,9; for women: 89.8 years
- low migration hypothesis: annual average 100 people migration loss

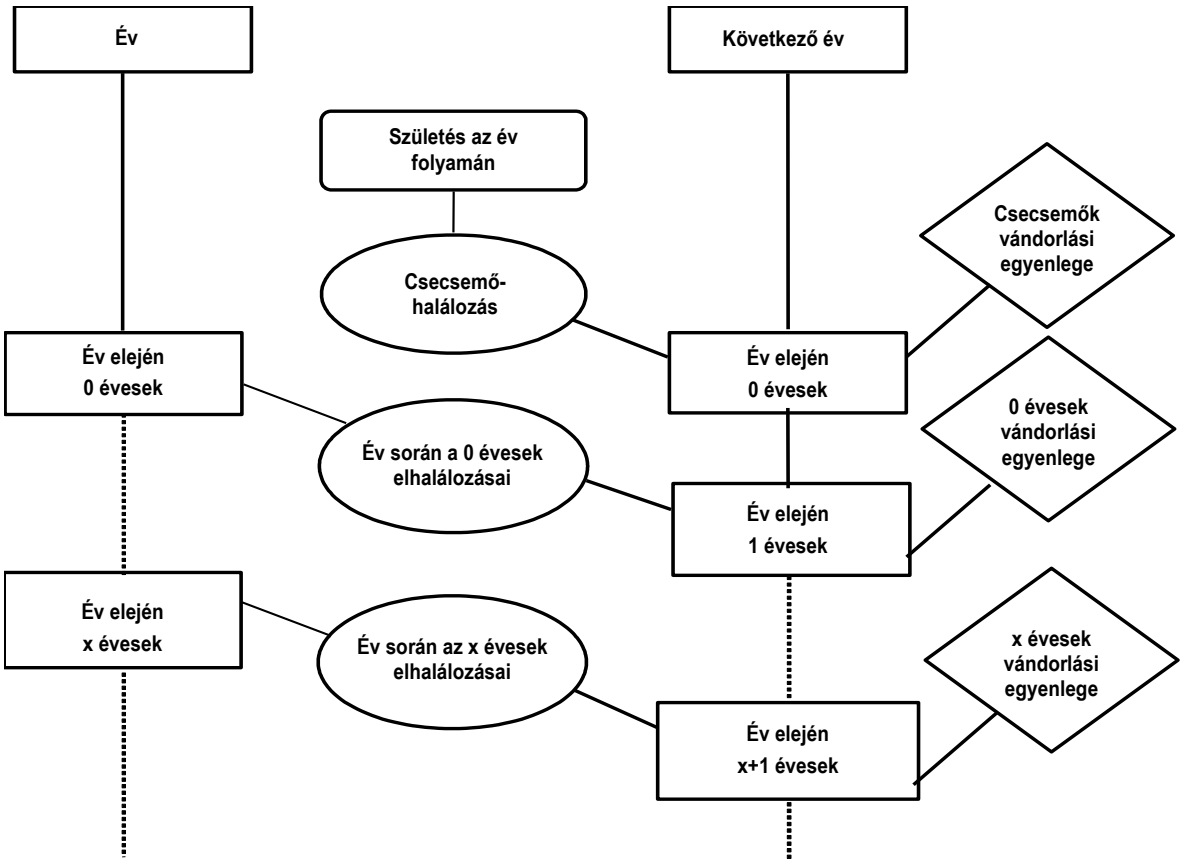
High case:

- high fertility hypothesis: total fertility rate: 1.65
- high mortality hypothesis: life expectancy at birth for men: 103.7; for women: 105.5 years
- high migration hypothesis: annual average 200 people migration gain

9.6.5.3 Calculation method for forward-looking calculation of population

We prepared the forward-looking calculation using the so-called cohort component method (or known under other name) recommended by the UN. Here we use the fertility, mortality and migration expected for the given periods and we calculate the population expected by the end of the forward-looking calculation period broken down to gender and age. Thus we break down the population changes to the components, and define separate assumptions for each, and then we apply them in line with the laws of demographic processes and so-to-say we “re-build” them to get the annually pre-calculated population.

The following figure presents the process of forward-looking calculation for one calendar year and for various age groups.



Source: Kovacsicsné 1996

Legend:
Év – year
Év elején 0 évesek – 0-year old at year start
Év elején x évesek – x-year old at year start
Születés az év folyamán –birth rate during the year
Csecsemő halálozás – infant mortality
Év során 0 évesek elhalálozásai – mortality of 0-year old during the year
Év során x évesek elhalálozásai – mortaliy of x-year old during the year
Következő év – next year
Év elején 0 évesek – 0-year old at year-start
Év elején 1 évesek – 1-year old at year-start
Év elején 1+x évesek –x+1 year old at year-start
Csecsemők vándorlási egyenlege – infant migration balance
0 évesek vándorlási egyenlege – migration balance of 0-year old
x évesek vándorlási egyenlege – migration balance of x-year old

Figure 9.6.5-4: Process of forward-looking calculation in a given year for the following calendar year

Estimates are prepared for every component of the -forward-looking calculation of population using a special method and process.

Forward-looking estimate of fertility

In this case the input data are the birth rate, gender of the new-born child and the mother's age. Using these data we can calculate the indicators required for the estimates. To be able to estimate the number of birth in a given year, we should know the frequency when a mother agrees to give birth to a child in various ages of the woman, i.e. what the share of women of a given age in the total population is from the total birth rate. This is shown in the fertility calendar, and it can be calculated using the hypothesis of the forward-looking calculation. We can prepare the model for the increasing age of birth by modifying "postponing" the initial birth age profile.

We must also know the boy-girl birth ratio, because this ratio allows us to estimate the share of boys and girls within the total number of birth. This is required to prepare an estimate broken down by gender for the forward-looking calculation. We can estimate the boy-girl birth ratio using the actual data for the years preceding the period covered by the forward-looking calculation; in our case assuming boys in 51.8 per cent of total birth. The boy-girl birth ratio is a fairly stable indicator; at birth the number of boys is higher, but as a consequence of different mortality indicators of the two genders this ratio is usually equalised between 40 and 50 years of age, and then the trend turns back: in older age groups the number of women is higher.

Forward-looking estimate of mortality

If we want to calculate the decline rate arising from mortality, we should first calculate the number of death broken down to gender and age. This can be done that we break up the average life expectancy at birth, in this case using the so-called exponentiation method. This means that we break down the gender and for every year we define the exponent that can be used for life expectancy data and thus we can arrive at the assumed life expectancy. [9.6-7]

Then we apply the perspective life expectancy probabilities and then we can calculate men and women mortality by age groups for every calendar year.

Forward-looking estimate of migration

To estimate migration, we have to prepare a hypothesis for defining the composition of migrants by gender and age – in addition to the migrants headcount. We can do this using the previous migration data: as migration data are uncertain, we usually use the age profile available for the past few years or eventually for the last one year. In most cases we use so kind of “smoothing” process for eliminating the extreme values or “irregularities” in the given year or years. In our case we used the 2011 migration age structure for preparing further estimates. We usually assume that migrants have the same fertility and mortality indicators as the recipient population.

9.6.5.4 Forward-looking calculation of residential population in Paks region

9.6.5.4.1 Number of residential population

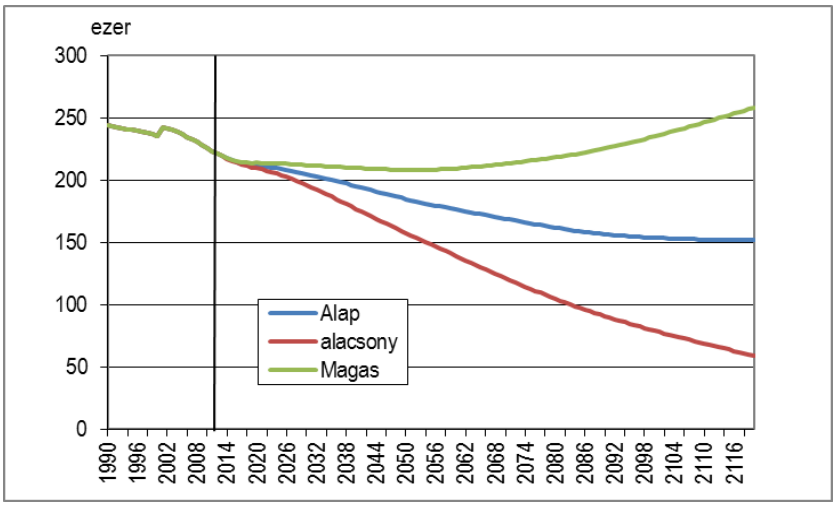
The number of population in the region shows a different picture as the various versions of the forward-looking calculations. More than 50 years later the number of population in the region will be between 121 000 and 213 000, and in 2120 the gap between the low and high case headcount figures will be even wider: 59 000 and 258 000, representing almost 200 000 people difference between the two numbers.

In the base case the initial population in 2012 was 221 000 and by 2020 it will drop to 212 000, representing 4 per cent population loss. In the low case this loss is 11 000 people, i.e. 5 per cent, and in the high case the 7 000 reduction represents 3 per cent population decline. It can be clearly seen that natural decline in the previous years will continue in every case or version, and this nearly 10-year period would not be enough for changing the tendencies in population changes even in the most optimistic version.

If we study the estimated prepared for a period looking forward to 50 years, we can find further 43 000 people loss in the base case representing nearly 20 per cent decline versus the number of population in 2020. The low case can clearly demonstrate the accelerating tendency of population decline: the decline is 89 000 people, i.e. more than 40 per cent. In the high case the population decline would stop and the number of population would in fact reach the input value.

After one century new changes will occur in the assumed demographic processes. The rate of population decline will be mitigated in the base case, and the population headcount will finally reach almost 152 000, i.e. 8 per cent decline by the end of the period. In the low case decline will remain steady, and a further 62 000 loss is expected, thus only 59 000 population will remain in the region. In the high case population will show a definite growth, i.e. 20% increase versus the initial status and thus the number of population will reach 248 000 people by the end of the forward-looking calculation period.

Thus decline will be the general tendency, and increase will begin only more than 50 years later even in the high case, and significant population gain can be expected only by the end of the forward-looking calculation period.



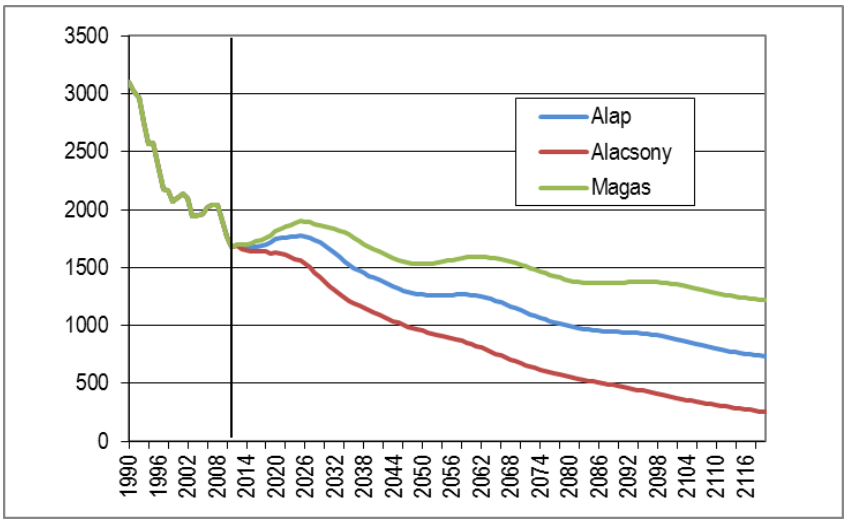
Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-5: Changes in the residential population in Paks region shown in different forward-looking calculations, 1990-2011

Basically two factors can determine the results: natural demographic processes in the region and migration. Demographic conditions of the region and the age structure of the residential population can lead to decline in itself on long term even if the balance of migration is not negative, i.e. the emigration is not characteristic. If in the base case we disregard migration, then the number of the residential population would decline to 135 000 people by 2120, and this is significantly lower than the population assumed in the base case, namely with 17 000 people, nearly 8% of the initial number of population. We have several times emphasised that migration has a volatile character and migration data are full of uncertainties.

9.6.5.4.2 Fertility profile

We defined the fertility hypotheses also in three versions, and we assumed in each version that the total fertility rate would increase from the 1.2 rate by 2012; the hypotheses assumed different rates for this increase. We have a view that the 1.45 fertility rate shown in the base case would be the most probable outcome – it would mean that 100 women would give birth to 145 children during their lifetime. The low case assumed a minimum increase, and final figure would be 125 children for 100 women. We also used a low-flame assumption for the expected number of children shown in the high case as we considered an increase in the fertility rates (predicted but not happened so far): i.e. 100 women would give birth to 165 children.



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-6: Birth rate in Paks region shown in different forward-looking calculation versions,1990-2011

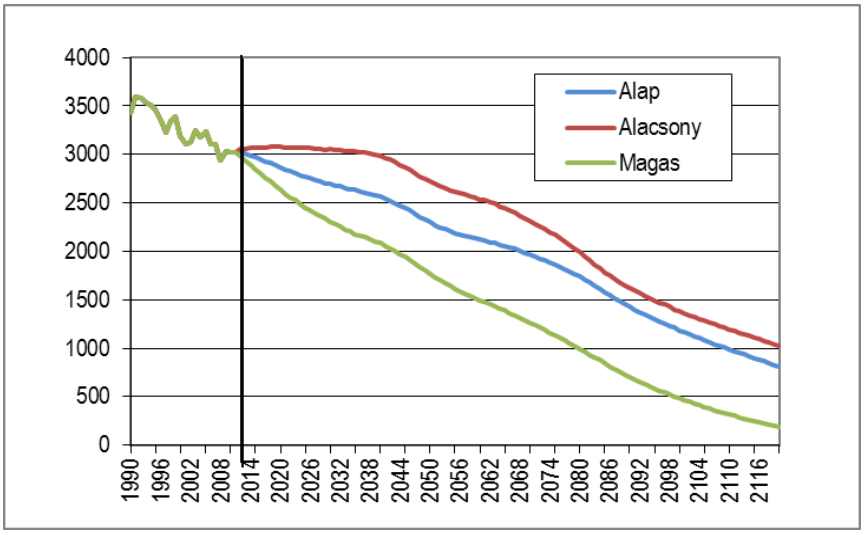
Declining birth rate is characteristic for all the three versions, though we can expect a temporary growth in birth rates as a result of fertility growth assumed for the beginning of the beginning of the base and high case extrapolation period. After this however volatility will emerge in the birth rate that follows the changes in the headcount of women in fertile age groups, showing a declining tendency on long term.

In 2011 almost 1700 children were born in the region. In the base case this number would slightly increase by 2020 getting close to 1750. After 50 years, i.e. in 2070 we can expect a brit rate only slightly above 1100, and by 2120 this would be little more than 700. The respected birth rate figures in low case were 1600, 700 and 250, whereas in the high case 1800, 1500 and 1200. Declining fertility rate will have a strong impact on decline of population, because the "un-born" girl children will not give birth to children, consequently the population will continue declining.

In summary: in the base case 131 000 children birth is expected, most of them (86 000 children) will be born by 2070, whereas a further 45 000 children in the subsequent 50 years. The low case assumes that 90 000 children would be born during the forward-looking calculation period, namely during its first section (i.e. until 2070) 69 000 children, and during the remaining period 22 000 children. This version can clearly demonstrate the above-mentioned exponential birth rate decline. In the high case 167 000 children would be born, nearly 100 000 until 2070, and a further 68 000 children until.

9.6.5.4.3 Mortality profile

The mortality hypotheses assume significant life expectancy increase in all the three versions both for men and women, and the hypotheses also expects that life expectancy profile of the two genders would get closer to each other. Mortality rate can reduce the growth in life expectancy – however, not only this factor will have impact onto the number of death, but also the population age structure and the share of the elderly population.



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-7: Mortality rate in Paks region shown in different forward-looking calculation versions - 1990-2011

All the three versions expected a declining mortality rate, the highest decline is predicted in the high case. In 2011 in Paks region 3038 people died. In the base case of the forward-looking calculation this number was 2020 lower than 2900, and in 2070 it is less than 2000 and in 2120 almost 800 people would die. In the low case the reduction is much lower: in 2020 the mortality will still increase, but even after 50 years, in 2300 we still expect more death cases; by 2120 the annual number of death will be around 1000. As a result of high growth in life expectancy the mortality indicators will sharply improve: in 2020 it will not even reach 300 per annum, in 2170 it will be a round 1260 and by 2120 it will be less than 200 people. We can expect this impressive improvement in mortality only as a result of extremely favourable changes.

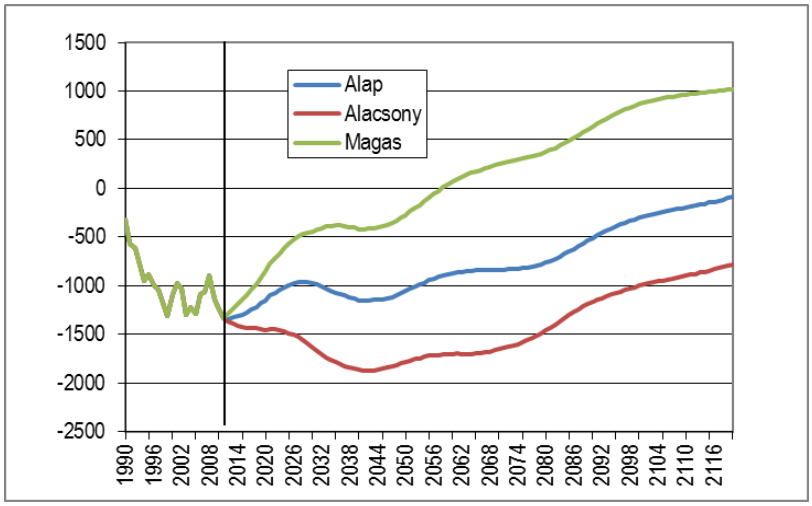
In summary: the base case predicts 214 000 death cases during the total forward-looking calculation period and most of them (nearly two-thirds) i.e. 147 000 will occur until 2070, while the remaining 67 000 during the next period. In the low case mortality rate will be higher, total 245 000 death cases. During the first period, until 2070 slightly more than two-thirds of the total mortality, 167 000 people will die, and the remaining one-third will die between 2070 and 2120. The

high case presents the lowest mortality rate, in total 152 000 death cases. Out of this figure 120 00 (nearly 805 of total cases) will die in the first 50-60 years, while the remaining 32 00 in the next 50 years.

9.6.5.4.4 Migration, natural and actual reproduction

Fertility, mortality and a migration rates can jointly influence the number of population. The balance of fertility and mortality represents the natural reproduction: we can speak about natural decline, when the number of death is higher than the number of birth, in the contrary case we speak about natural gain. We calculate the actual changes in the number of population also counting with migration, i.e. we add the balance of migrations to the natural loss/gain, and the result can be positive of the number of immigrants arriving to the region is higher than the number of emigrants leaving the region, and can be negative in the contrary event.

In the base case of the forward-looking calculation we assume more than 13 000 migration gain during the total forward-looking calculation period, most of this gain (more than 8 000 people) will migrate into the region until 2070, and a further 5 000 people after this date. In the low case we expect a migration loss, nearly 8 000 people during the total period, most of them (5 000 people) will leave the region between 2070-2120. The assumed labour immigration would to a great extent mitigate migration loss during the period until 2070. In the high case the greatest migration gain will be total 24 000 people, as a result of immigration of 14 000 and 10 000 people, respectively in accordance with the periods as described above.



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-8: Natural reproduction rate in Paks region swhon in different forward-looking calculation versions - 1990-2011

Natural reproduction will remain negative throughout the period covered by the base and low cases of the total forward-looking calculation, i.e. we can speak about natural decline. Natural gain will occur only in the high case, during the second phase of the forward-looking calculation period. In the base case a natural loss of total 83 000 will occur until 2120, three-quarters until 2070, then as a result of declining mortality and growing birth rate only one-quarter by the end of the period. Natural decline in the low case will be nearly twice the base case value: 155 000 people –two-thirds by 2070, and one-third by 2120. In the high case natural demographic processes also present a positive balance, total 13 000 population gain population, result of 22 000 decline until 2070 and 35 000 reproduction in the next 50 years.

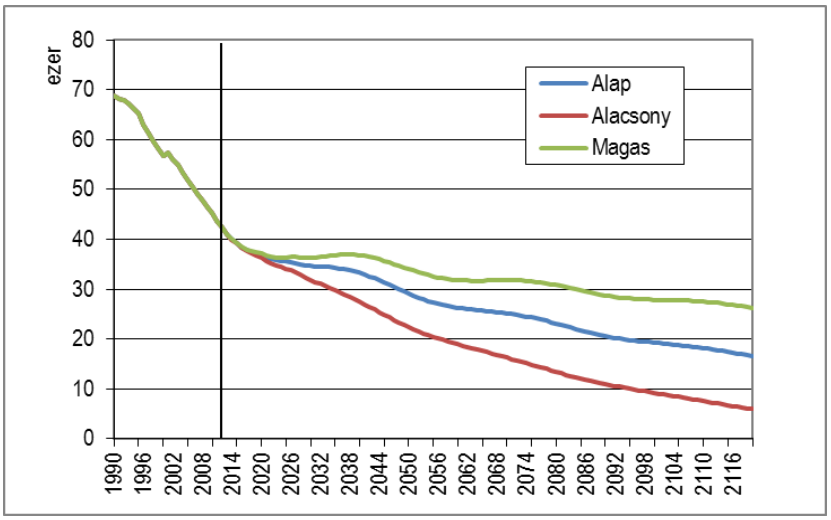
The balance of migration will modify the population number arising from natural reproduction – and naturally also its structure, to some extent. In the base and high case the balance of migration is positive from 2015, thus it mitigates the effects of natural decline, while the low case has a negative migration balance, and thus it strengthens the natural decline trend. The actual decline in the base case is 69 000, and in the low case 162 000 people. The high case has a positive balance: population will grow with total 38 000 people versus the 2012 figure.

If we compare data from the migration balance and natural reproduction or decline we can see that natural demographic processes, fertility and mortality can primarily determine changes in the regional population. However, migration may also cause larger and different changes in the population development, if actual volumes and directions in the future can significantly vary versus the assumptions.

9.6.5.4.5 Changes in the age structure

We also calculate headcount data and their ratios within total population during the forward-looking calculations. The so-called high-priority aggregated age groups are the most conspicuous in the summary analysis: the juvenile age group (0–19), working age group (20–64), and elderly age group, i.e. people with minimum 65 years of age.

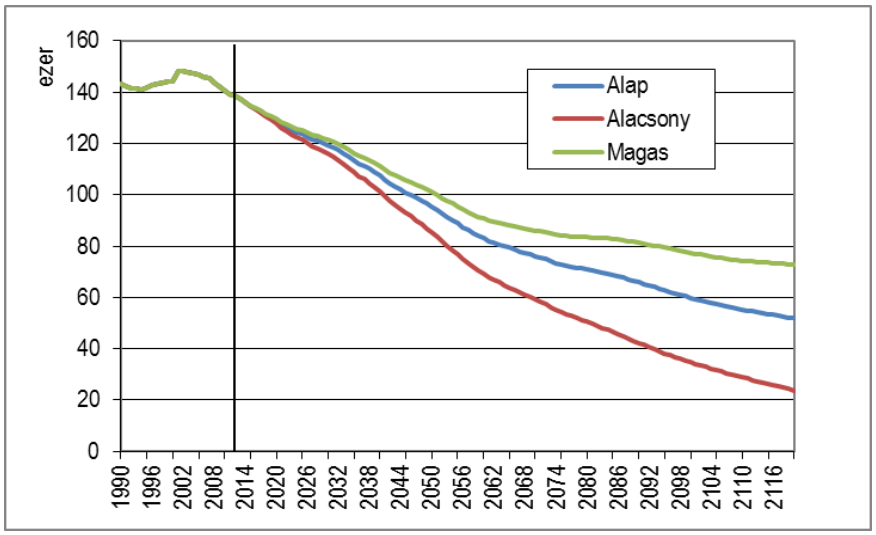
The headcount of the 0-19 age group is alarming in every scenario. Headcount in this age will decline from 42 000 in 2012 to less than 37 000 by 2020, representing a 12 per cent decline within 8 years. In 2070 the expected headcount will be only 25 000 (40 per cent decline versus 2012), and in 2120 only 17 000 – this means that the share of young generation within the total population will shrink to 40 per cent versus the initial headcount figure. The low case is even more pessimistic: as early as in 2070 only 16 000 will be the calculated headcount, and by the end of the period the 0-19 age group will almost fully disappear: the headcount will be only 6 000. This indicates the dramatic impacts of highly unfavourable birth, mortality and migration trends if prevailing on longer term. The high case predicts 37 000 headcount loss in 2020, and 32 000 in 2070 (24 per cent decline), and by the end of the period 26 000 (in total 38 per cent loss in the age group).



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-9: Headcount of 0-19 age group in Paks region shown in different forward-looking calculation versions – 1990-2120

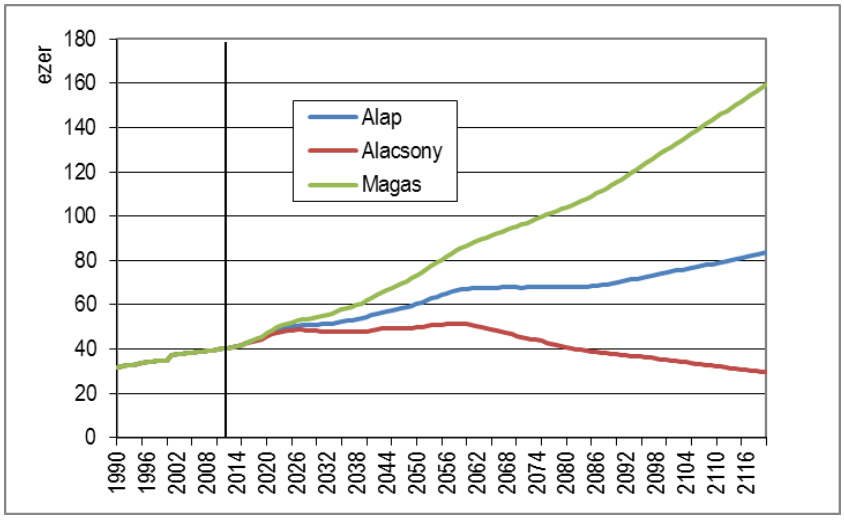
As the number of younger age group is declining and the population is ageing we can expect that the headcount of middle-age generations (20-64) would also decline. In fact this is true and only the high case of the forward-looking calculation shows a short stagnation, and then the age group headcount will decline also in this age group. In the base case the age group headcount is 139 000 in 2012 but by 2020 it will drop to 129 000, representing 7 per cent decline. In 2070 the headcount will be 76 000, as a result of total 41 per cent decline. At the end of the forward-looking calculation period the headcount of this age group will be only 52 000 (nearly 60 per cent decline). In the low case the headcount is only slightly lower in 2020: namely 128 000. However, this figure rapidly declines in this age group, in 2070 it will be 59 000 – not much higher than the figure predicted in the base case for 50 years later, and in 2120 it will be only 24 000. In the high case almost 130 000 people will belong into this age group in 2020, and in 2070 this figure will be 86 000, and in 2120 only 73 000. Thus in the high case the headcount will decline and reach the same level by the end of the period as in the base case by 2070.



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-10: Headcount of 20-64 age group in Paks region shown in different forward-looking calculation versions - 1990-2120

Decline in the working age population can in itself emerge several questions and problems, but if we also add to this the other tendency, namely that the headcount of the elderly population (+65), and as we will soon see also the share of this age group within the total population will also increase, we have very good reasons to worry. We can see a relatively moderate growth in the base case of the forward-looking calculation and a steady and steep growth in the high case, whereas in the low case decline will begin from 2060. In 2012 the headcount in the oldest age group headcount was 40 000, and the base case predicted a growth, namely 46 000 for 2020, 68 000 for 2070 and 83 000 for 2120, doubling the initial headcount by the end of the period. In the low case the age group headcount almost constant between 2020 and 2070 (around 46 000) and then will suddenly drop to 30 000 by the end of the period. The high case predicts a sharp growth: the headcount will be 47 000 in 2020, 95 000 in 2070 i.e. nearly 2,5-times the initial headcount. 159 000 is predicted by 2120, 4-times the 2012 headcount. This growth rate can, of course, be reached only if life expectancy significantly increases – as explained in the hypotheses.



Legend: alap – baseline, alacsony – low, magas – high

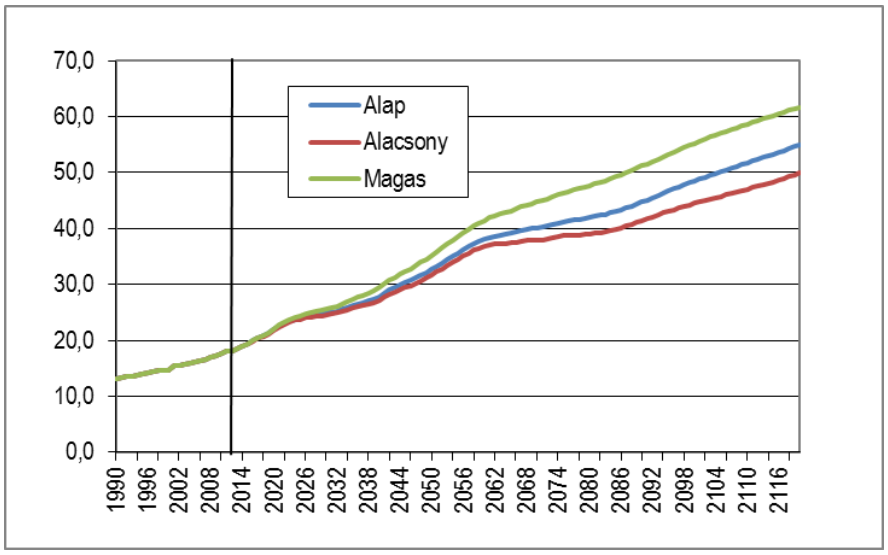
Figure 9.6.5-11: Headcont of +65 age group in Paks region shown in different forward-looking calculation versions - 1990-2120

Demographic ageing is one of the key factors behind changes in Hungary's population, and this means firstly the gradually growing life expectancy at birth, and secondly – as combined impact of low fertility – the increasing share of elderly age groups within the total population. So in addition to changes expected in various age groups, we should focus also on the share of various age groups within the total population. Changes in ratios of elderly age groups are particularly critical from this aspect.

Share of young age groups (0-19) within the total population in the region will continuously decline in harmony with national processes, though we can see some volatility in the forward-looking calculation period subject to changes in the birth rate, thus the decline is not linear. In the base case of the forward-looking calculation this group has 19 per cent share in the total population in the region in 2012, and this will decline to 17 per cent by 2020, 15 per cent by 2070, and 10 per cent by the end of the period – i.e. this share from the total population will drop to half. In the low case of the forward-looking calculation the value in 2070 is slightly lower than in the other two versions. The shares in the high case were similar to those in the base case – with higher number of population.

Share of the middle-aged group (20-64) within the total population in 2012 was 63 per cent, and this will somewhat decline by 2020 to 61 per cent. Then it will almost free-fall: in 2070 less than half of the total population – 45 per cent-, and in 2120 slightly more than one-third (34 per cent) belongs into this age group. In the low case we can see slightly more favourable shares: the figures relevant for the past two years are 49 and 40 per cent. In the high case we can see an even more unfavourable picture than in the base case: in 2070 the share of the middle-aged group will be only 40 per cent in the total population, and in 2120 only 28 per cent. The primary reason behind this change is the growing share of the elderly age group.

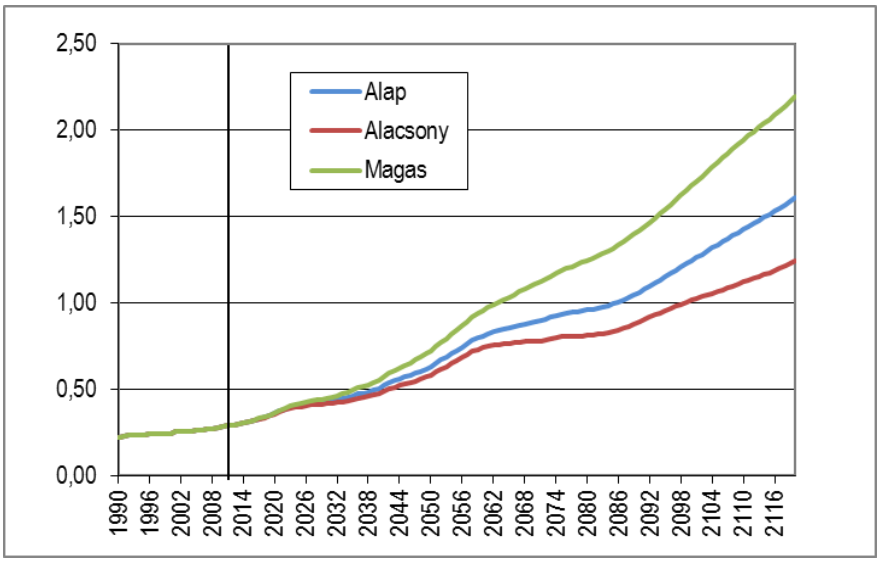
Share of the +65 age group within the total population in the region will rapidly grow in every forward-looking calculation version. In the base case this share will grow from 18 per cent in 2012 up to 22 per cent by 2020, and after 50 years it will reach 40 per cent, and after another 50 years more than half of the total population will be elderly (55 per cent). In the low case the respective two figures are 38 and 50 per cent, somewhat more favourable than in the base case. However, the high case of the forward-looking calculation 45 per cent in 2070 and 62 per cent in 2120 are very high figures as a result of very high life expectancy and fertility indicators not sufficient even for securing a simply reproduction.



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-12: Share of population of +65 age group within total population in Paks region shown in different forward-looking calculation versions - 1990-2120

There are several indicators for studying the share of a given age group within the total population. One of them is the old age dependence, the ratio of the older (+65) and middle-aged groups (20-64); and the other key indicator is the ageing index that compares the headcount of the elderlies with the number of young generations. In 2012 in Paks region the dependence rate was 0.29 i.e. there were somewhat 3-times more people in the middle-aged people in the total population than the elderlies. In the base case this indicator will be 0.89 in 2070, and by the end of the period 1.61 – this means that the number of elderlies is more than 1.5-times higher than the number of middle-aged people. If this indicator can reach 1 that will be the break-even point in the ratio between elderlies and middle-aged. In the low case the highest value of this indicator is 1.25 i.e. the headcount of the elderlies is a 25 % higher than the number of middle-aged. The high case shows a 11 % elderly gain in 2070, and by 2120 the indicator will be higher than 2 (2.19).



Legend: alap – baseline, alacsony – low, magas – high

Figure 9.6.5-13: Old age dependence rate in Paks region shown in different forward-looking calculation versions, 1990-2120

The ageing index presents the ratio between the elderlies and the young people. This index in the region almost reached 1 (0.95) in 2012, and by 2070 it will be 2.7 and in 2120 it will be 5 – i.e. there will be 5-times more elderly than young people in the total population of the region. The low case of the forward-looking calculation shows similar figures, while the high case the indicator is only 3 in 2070 due to effects of the enhanced ageing processes, and in 2120 it will be twice as high, i.e. there will be 6-times more elderly than young people in the total population of the region.

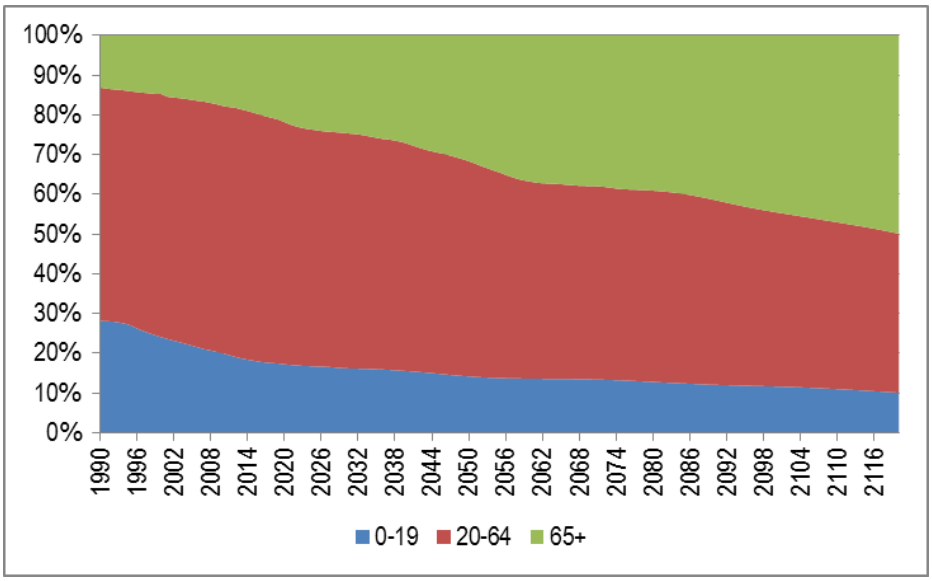


Figure 9.6.5-14: Changes in population age structure in Paks region shown in base case of forward-looking calculation 1990-2120

Low fertility and low mortality, and moderate migration rates can also on long term define the age structure: share of young and middle-aged groups will rapidly decline while share of the elderlies will rapidly increase.

These regional processes will progress parallel with the national tendencies, and arise similar issues also within the region partly regarding the population decline and party the sustenance of the elderlies.

9.6.5.5 Summary

The regional population-forward-looking calculation predicts changes in the population, including breakdown figures for genders and age groups. The primary purpose of forward-looking calculation is to provide the basic population data for long term planning, preparing development strategies, fundamental calculations and estimates.

When we prepared various versions of the forward-looking calculation different we used the demographic changes potentially emerging between 1990-2012: significant fertility decline, special changes in mortality and migration tendencies. We compared these processes with the assumptions and results obtained from the forward-looking calculations for national population, and thus we could elaborate a realistic set of conditions for the forward estimates and a model for monitoring and predicting demographic changes in Paks region with the expected degree of accuracy. We must emphasise that results of the last population census may have effects onto the accuracy of the forward-looking calculation, but knowing the preliminary results we have good reasons to presume that any eventual mistake or error cannot significantly change the predicted tendencies and the relevant values, rates and ratios.

The said forward-looking calculations can support a basic tendency that the population will for sure significantly decline on long term.

There is another clear-cut tendency, the population ageing, and it will run simultaneously with the decline in the number and share of younger age-groups and the increase in the share of older age groups.

9.7 IMPACTS OF PAKS DEVELOPMENT

9.7.1 ECONOMIC IMPACTS, CONDITIONS

The planned Paks development will have significant impacts onto the economy of the total country, and evidently also to the economy of the region and Paks city.

On national level we should highlight the improving economic performance (GDP) as it will grow as a result of the project, because parallel with the preparatory works for the planned project domestic undertakings will begin preparations as they want to be involved into the project implementation, and all this have and will have effects onto education, development of the human resources and technical assets of the relevant undertakings and their innovation.

As specified in Paragraph 2 of Article 4 of Act II of 2014, on the promulgation of the Treaty between the Hungarian Government and the Government of the Russian Federation on the cooperation in peaceful utilisation of nuclear energy „The Parties shall do their best efforts to reach the 40% minimum localisation level if this is reasonably feasible in order that the cooperation envisaged in the present Treaty can be implemented and frameworks specified by the relevant laws so allow" thus the Hungarian Government regards the planned project significant not only from aspects of energy policy, but will manage the project as a top priority also from aspects of industrial policy. Thus out of the total project CAPEX (planned as 12.5 billion EUR) 5 billion EUR would most probably implemented involving domestic undertakings, and this figure represents nearly 5% of the domestic annual GDP, so this is quite a significant item even on national economic level.

From energy policy aspects and as the Government expects, the „mix" that can ensure the electric energy generation for the country will remain well-balanced also after the date when 1-4. Paks units will be de-commissioned, and the country's dependence of import energy carriers (nuclear fuel can be acquired from several sources of supply and a sizeable stock can be also stored) and dependence of direct electric energy import will reduce versus the "no-development" scenario, and the price of electric energy generated by Paks development will remain competitive on long term, providing a competitive advantage for the energy-intensive domestic undertakings, enabling even the increase in their production volume.

It is an extremely critical criteria from industry policy aspects that undertakings involved into the project (as mentioned above) will be more competitive also after the project as a result of developments in their human resources and physical assets and this improvement will have multiplicator impacts onto the performance of the national economy, employment rate, expanding consumption of the population, in addition to the direct impacts onto Paks development, and as a result also onto the state's income from tax and royalty. There is another national economic aspect, namely that Paks development will enrich the treasury with a high-value and up-to-date asset, and as added value the development will also help sustaining a world-famous and state-of-the-art professional culture.

There is another goal on national economy level related to the planned new units of the Nuclear Power Plant: domestic suppliers should have a chance for participating in the works in as high as possible number. The maximum share that can be realistically achieved is around 30-40 %. Results of presently ongoing international Nuclear Power Plant projects can clearly demonstrate that sub.-contractors (suppliers) can be intensively involved from the national economy of the ordering party into the preparatory, construction, technology assembly, manufacturing and then operation and maintenance works and processes only if they are consciously prepared and developed in a planned manner and organised into a system that can supplement, complement and strengthen each other. The degree of usefulness of the power plant project on national economy level will be greatly enhanced if the preparation is well-planned, properly designed and sub-contractors are systematically prepared and trained, as thus significant extra cost potentially arising during the project can be avoided.

The implementation of new units is a project that can for years or even for one full decade offer significant orders for several domestic companies, contractors and provide employment for several thousand employees either on the site, or in various planning, technical engineering and research institutes, pre-assembly and manufacturing factories and plants during the preparatory works. If we want to cover 30-40% of the total project CAPEX with domestic suppliers and contractors it will require well-planned preparations and well-organised cooperation among the companies and institutions. Hungary's manufacturing capacity in the energy sector and the capacity of various construction and building companies have significantly declined during the past two decades. Total re-vitalisation is not realistic, and the goal could rather be to prepare and collaborate with primarily small and medium size companies that are potentially capable of such cooperation.

As part of the preparatory project the potentially eligible companies and contractors that can be involved into the planned project were surveyed. Two approaches were applied. Firstly companies regarded as high-priority were analysed on national level, and secondly companies located in the environment of Paks Nuclear Power Plant, primarily as potential candidates for the sub-contractors chain were surveyed. As a result of the national survey nearly 150 potentially relevant companies were recorded in the database, broken down to suppliers, service providers by professions (nuclear, civil engineering, control technology, electricity, architecture, chemistry, other) and to activities (R+D, planning, manufacturing, transportation, building, assembly, commissioning, expert jobs, other). Assets, capacities, references, quality assurance parameters of the companies, and import share of components for manufacturing were all recorded.

It is a natural expectation that companies operating in the wider environment of Paks Nuclear Power Plant can be involved into the implementation as participants with fair chance, thus enhancing the regional entrepreneurial potential and providing chances for employing local manpower. The region contains 90 settlements in the area carefully delineated using specific criteria and covering both banks of Danube and 3 counties. The study addressed companies operating in the field of building industry, manufacturing, assembly and transportation, and their headcount is minimum 10 employees, and are interested in and willing to participate in the project implementation through some kind of contractual structure. As part of the surveying process, the potentially cooperating companies were classified into various categories based on competences (employees and assets/equipment), references, capital power, balance data, certificates or accreditations and readiness for further training. The regional companies can be candidates in the project not only directly, but also indirectly in auxiliary works (e.g. infrastructure construction). As a result of the survey nearly 240 regional companies were registered in the database.

9.7.2 SOCIAL RELATIONSHIPS, SET OF CONDITIONS

MVM Paks Nuclear Power Plant Zrt. has been present almost for four decades in the region defined by a Paks – Szekszárd - Kalocsa centres. As a result of well-planned and structured process the Pant has built up a regional set of connections that covers a cooperation based on mutual respect, understanding and benefits. This robust supporting and symbiotic relationship provided a solid basis for the decision-makers for adopting decision with utmost significance like extension of the operation time and implementation of new units. Decisions adopted by the Parliament and the Government aiming at the construction of the new Nuclear Power Plant units extremely require to improve the economic and social relationship with the region around the power plant, and to enrich and energize its content. Strengthening the regional acceptance and cooperation readiness, improving confidence of local governments, municipalities, companies and citizens is one of the key pre-conditions for the expansion program, and this should be addressed already during the preparatory phase of the main project.

MVM Paks Nuclear Power Plant Zrt. is evidently the no. 1. company and employer of the region and it has explicitly assumed the responsibility for the status of the environment, the quality of life of the local population, development and future of the region. The power plant and the related development project can be successful if the plant itself can function in a virulent economic and social environment, and efficiencies can mutually strengthen each other. The process of implementation of the new units is an outstanding issue for people living around the Paks Nuclear Power Plant and they are looking forward to democratic processes offering them the chance for offering opinion. The level of support from the region is quite reassuring at the moment and relations are dynamic, improving through serious expectations are also formed. Local government, municipalities and population of the settlements as well as the stakeholder companies expect initiative steps to verify long term cooperation as early as during the preparatory phase of the main project.

It is imperative that the recipient region must be involved and made interested, and this will primarily connected to manpower supply and its logistical system, in addition to undertaking development. The preparatory project addressed these issues in full details. First of all we had to prepare the list of professions that are required for the construction, assembly commissioning and then operation of the Nuclear Power Plant and that is consistent with the National Training Registry system and the domestic high-level training guidelines. This document was prepared in cooperation with eminent energy experts and university departments with experiences from major projects. Manpower needs of potential bidders can form the basis for all subsequent surveys. Conclusion of the inter-governmental treaty between Hungary and Russia could simplify the situation, and from then we had to use only the preliminary data supplied by Atomstroyexport as the sole data base.

A large-scale survey was prepared covering 90 settlements in Tolna, Baranya and Bács-Kiskun counties in order that the presently available skilled manpower and that can potentially be made available for future demands in the wider region

can be registered. As there was no state and public administration registry system available the database had to be prepared using results of a large-scale field work based on sampling work. All this can provide a solid basis for a study on availability of regional manpower labour and its preparation for the main project. Based on the survey of available manpower broken down to professions these data available in the region can be easily compared with the regional manpower potential. It is assumed that only 20% of the manpower available in the studied region can be involved into the construction and assembly works of the planned new units of the Nuclear Power Plant, so we can state the only 25-30 % of the required manpower can be supplied from the region. Naturally there are significant differences in various professions. Based on results of comparative analysis we can state that major shortage problems would primarily emerge in the following professions: carpenter, scaffolding workers, reinforced concrete workers, qualified welder, fitter and ironer, electricity system and control technology assembly technicians.

The special secondary-level training, vocational training and adult education institutions and companies in the region were also surveyed, including their education and training capacities and conditions, infrastructure, practice background, development plans and flexibility. These schools and training institutions can supply the manpower that is presently not available on the labour market and cannot be predicted as they can launch targeted and tailor-made new training courses, increase the headcount in the existing courses and improve training conditions. Departments, faculties and chairs in the domestic technical high-level education system were also surveyed including some high-priority institutions with similar profile in the neighbouring countries. A decision-preparatory document was also prepared analysing re-start of the College of Energy Technology in Paks as an off-site faculty.

A system was also prepared for students presently learning in various secondary schools for encouraging and incentivising them to continue their studies in technical universities and colleges, broken down to discipline levels and supplemented with energy-related practices and on-the-spot professional practical training. There is a system of cooperation agreements signed with various secondary schools in the region around Paks Nuclear Power Plant and they contain a specific supplementary training for physics from class 11 with enhanced level high-school graduation certificate. Students studying in various universities in the country are more inclined to return into the region if the project can offer them employment and challenging professional carrier opportunities. A special fellowship and mentoring system was also elaborated both for medium and high levels because young experts can be retained and effects of international brain drain can be prevented in the electricity sector only through these solutions.

Human resource research documents can provide data regarding the manpower needs arising during the a project broken down to headcount figures and years and the relevant service needs attached thereto. Enforced employment of regional manpower (which should be in fact an issue of top priority) demands for accommodation and other services can be significantly reduced but then traffic and commuting demands would increase. Kalocsa region would also receive a high-priority treatment including promotion to ferry services on Danube. Environmentally-friendly traffic solutions should be also preferred just like large-size parking plots that can be later utilised for other purposes. Available accommodation places should be surveyed including the relevant development and expansion options in line with the recommendations of the International Atomic Energy Agency. In addition to securing accommodation facilities in accordance with the transition and 21st century requirements actions will be required for securing final settlement opportunities for the would-be operating crew and the family members. Acceptance attitude of various settlements should be also analysed. Issues like food supply, catering services, medical or healthcare and social services for more than 1 000 people will also need attention and solution, as well as public security issues, sport and leisure time and recreational activities and programs. Expansion options for nurseries, kindergartens and education facilities should be carefully analysed well in advance, and securing employment options in time for women (family members) is also a key issue.

On regional level the a planned development will primarily be significant during the implementation phase: infrastructure will develop, regional companies engaged in providing accommodation and related services for people working on the project will earn extra income, and following the development and the de-commissioning of units 1-4. mainly on long term a solvent employment and contractor group will remain in the region as they will be responsible for the operation and maintenance of the new units, thus compensating the negative economic and social impacts potentially arising from the shutdown of the old units.

Though Paks city has developed definite decentralisation ideas, it will have a high-priority role already during the preparatory phase, thus it is reasonable for the city to maintain continuous cooperation with the project. Surveying the required infrastructure developments and launching the related planning and preparatory actions as well as identification of the required resources is going on. Development options for Paks Industrial Park and opportunities for enlarging its territory are also key issues. It is very important that plants and other facilities (including offices as well) that will be involved into the preparation of construction and assembly and later the operation of the power plant settle down in or

near the city. Szekszárd is a major city and should be treated accordingly during the project preparation and implementation phases. Villages located in the region of the power plant that assume specific roles in order to support and make the project successful (e.g. accepting the container city for accommodation, providing the required land and public utility connections, smooth licensing procedure, manpower mobilisation, cooperation in training, communication support, residential area plotting, providing sport and recreation programs and facilities) will be included into the partner settlement network. Members of this network will not be entitled for any financial benefit but will receive various opportunities. All this requires detailed preparatory work form these settlements in order that the final result can be based on realistic local resources.

MVM Paks Nuclear Power Plant Zrt. has been operating a social support system for nearly a decade in the form of a foundation with the purpose to help regional, urban and rural development, undertaking development and establishment of new workplaces. With the help of this foundation various developments of more than HUF 30 billion value have been implemented in the beneficiary region through direct and indirect support (down-payment for bidding), also including several hundred new workplaces.

An organisation has to be established which is able to efficiently represent the realistic demands and interests of the regional population with the help of a registered legal entity status, independent program, operation system and budget in order that a successful dialogue can be established and maintained between the Nuclear Power Plant and the population in the region. Accordingly, the Social Control, Information and Settlement Development society (TEIT) was established in 1992 with the representatives of local governments and municipalities of 13 settlements. The Society performs control activity, and maintains a close cooperation with the power plant in forwarding information. Its goal is not to oppose the power plant, but rather protecting the interest of the population, maintaining sincere dialogue and cooperation and to improve mutual confidence. TEIT publishes periodicals and established a social committee for control.

There are living various communication opportunities between MVM Paks Nuclear Power Plant Zrt. and the regional population looking back to several decades history. This wide-range communication and commenting opportunity provides a solid base and building for confidence-building, steady cooperation and consensus-creation. In the spirit of open-door policy the power plant operates a visitor centre next to the power plant and at Kalocsa, and these are the most important places for meetings between the population and the nuclear industry, and they can offer daily opportunities for personally capturing information for every Hungarian citizen including people living in the region. The power plant maintains close cooperation with representatives of the local, regional and national press and media, supplying them with regular or ad hoc (if so required) information documents. MVM Paks Nuclear Power Plant Zrt. issues its own newsletter providing exact information on events in the power plant, the plans and development ideas. The newsletter is widely circulated and delivered to every post-box of houses in settlements within a 12 km radius (TEIT). people living in Paks, Kalocsa, Gerjen and Uszód can obtain information round the clock through the monitors displayed in the city/village centres showing the timely local broadcasting conditions in an easy-to-understand and comparative approach.

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