

Water management as a part of civil engineering sector in Slovenia

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ABSTRACT

The construction industry including water management sector represents an important part of the Slovenian economy and during the recession that started in 2009, this industry has shrunk for ~10-20% annually, and in 2012 it dropped below 50% of the 2008 level. Compared to Austria, Slovenia invests up to more than three times less into the water management sector, including regular maintenance. Flood hazard in Slovenia is increasing rather than decreasing, and organisation of the water management sector was claimed to a large extent to be one of the major reasons for the present deteriorating situation. In 2016, a newly established Directorate for Waters of the Republic of Slovenia should bring fresh air into the scene. Considering rather poor condition of water infrastructure in Slovenia and very high flood hazard, water management must become one of the top priorities in years to come.

KEYWORDS

financial investments; regular maintenance; Slovenia; water infrastructure; water management

INTRODUCTION

A healthy status of the Slovenian construction sector is not only the responsibility of the sector itself, part of which is also the water management sector, but of the whole society. The construction industry represents an important part of the Slovenian economy (around 6% GDP) and before the recession that started in 2009, in Slovenian construction sector there were more than 90.000 employees in 4600 constructional companies, plus 10.000 self-employed workers directly working in construction business. In 2009, the construction sector started to shrink for about 10-20% annually, and in 2012 it was already well below 50% of the 2008 level. Engineering works (including water management and flood protection measures) represents 50% of Slovenian construction sector activities (the rest is construction of buildings). In 2012, five out of ten biggest Slovenian construction companies were bankrupt and three more were in serious financial problems. Revival of the construction sector as a part of the industrial sector is crucial for the revival of Slovenian economy in general to come of the financial and economic crisis started in 2009. In the last two years construction sector was mainly growing due to realisation of the EU Cohesion Fund projects for building sewage systems in rural areas. With the end of 2015 the majority of these

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projects will finish and 2016 will be crucial for many of the construction companies (including water management sector) in Slovenia since there are no new infrastructural projects in sight in the near future.

WATER MANAGEMENT IN SLOVENIA

In Slovenia, water management is governed by the Ministry of the environment and spatial planning that prepares all national legislation (harmonized with EU directives). The operational body on the national level is Slovenian Environment Agency (ARSO). ARSO is the water manager on the national level and is in charge for all spatial planning permits, maintenance works on water infrastructure, water infrastructure cadastre, restoration plans after natural disasters, supervision, etc. Slovenia is divided into eight river sub-basins (watersheds). Each watershed has a concessionaire for maintenance works on water infrastructure and other tasks holding a concession contract with the Ministry. Concessionaires are local Water management companies which are responsible for carrying out maintenance works, according to plans, prepared by the Agency.

In the last two decades all these companies have become private firms and the Republic of Slovenia owns only 25% + 1 share or even less in some cases. In the last strategic plan for final privatisation of selected state capital investments, the Government of the Republic of Slovenia recognized Water management companies as strategic property and decided not to fully privatise them. On the other hand, state owned institutions are not acceptable in Slovenia since we are still in process of privatisation. Water management "in the field" is carried out through these companies. Scope of these measures is limited with funding possibilities of the Agency and the Ministry. Funding of maintenance works was shrinking and today it represents only about 10-20% of yearly business of Water management companies. These companies were forced to start building other structures on the free market (canalization systems, roads, other infrastructure). Two of eight water management companies went bankrupt due to lack of business. Analysis show that in the period from 1986 to 1998 funding of water management in Slovenia shrank from 0.71% to 0.07% of GDP (Umek and Banovec, 1998). This trend lead slowed down the education process and gaining operational experiences of professionals. Civil engineering study programs have become non-attractive and new engineers have hard time to gain operational experiences.

WATER MANAGEMENT FINANCING IN SLOVENIA AND A COMPARISON WITH AUSTRIA

Slovenia and Austria are comparable in terms of topography, climate, torrents and rivers. Population density is also comparable (105 p/km²). Austria has 100,000km of waterways with a density of 1.2km/km² (BMLFUW, 2010; 2012a) and Slovenia has 28,000km of rivers with a density of 1.4 km/km² (Bat et al., 2003). Due to low financing of water managements sector in Slovenia in the last two decades, water infrastructure is in a very poor condition and therefore the flood hazard level of many densely populated areas is very high. The analysis of financial investments in the water management sector (water infrastructure for river engineering and in general for the protection against floods, torrents, landslides, avalanches,

and erosion) of Austria and Slovenia in the period 2002-2014 was prepared. Given the differences between the two countries in gross domestic product, population and length of the hydrographic network, in all cases investments in Slovenia are significantly lagging behind Austria.

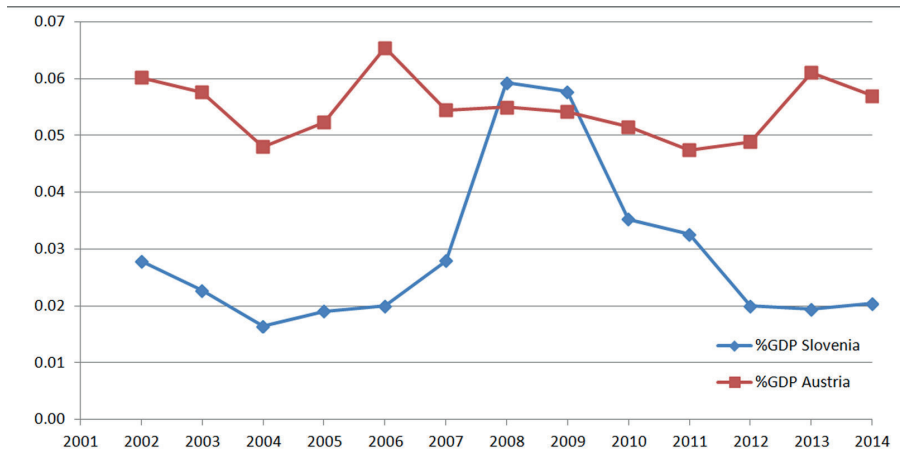


Figure 1: Comparison of “water management investments” as % GDP between Slovenia and Austria.

Slovenia invests in the water management sector for the mentioned purposes annually on average between 0.02 and 0.03% of GDP, Austria, on average, 0.055% (Fig. 1). Slovenia invests comparably to Austria only in years with extreme floods that have caused damages of several 100 million EUR (2008 and 2009 after massive flooding in September 2007).

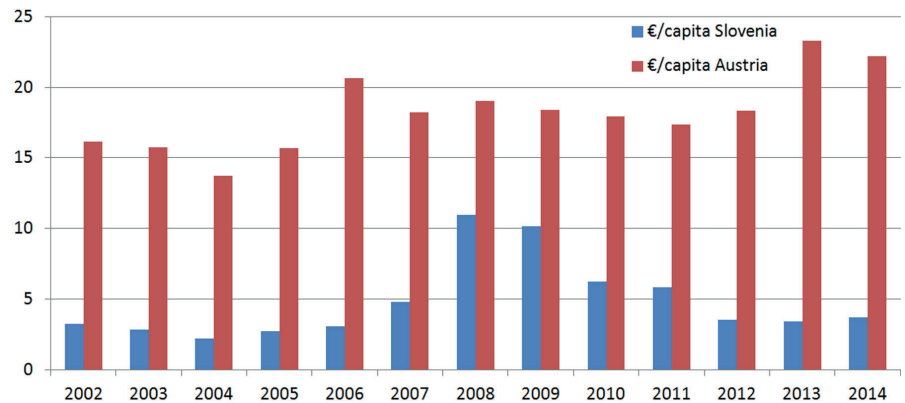


Figure 2: Comparison of “water management investments” as €/capita between Slovenia and Austria.

With regard to the number of inhabitants, the annual investment into water management in Slovenia is 5 EUR per capita and in Austria is 17 EUR per capita (Fig. 2). Also the investments for a kilometre of a watercourse in Slovenia were on average only about 400 EUR per km and in Austria nearly 1500 EUR per km in the investigated period (Fig. 3).

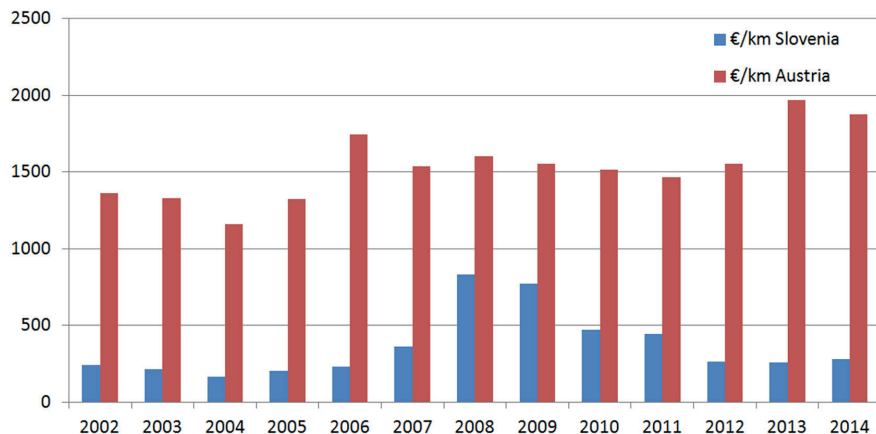


Figure 3: Comparison of “water management investments” as €/km between Slovenia and Austria.

The ratios for Slovenia are even worse, because we used in the presented analysis for Austria only data on its state funding. On average, every year the Austrian Federal Government makes available funds (subsidies are granted subject to the provisions of the Hydraulic Engineering Assistance Act) from the Disaster Relief Fund of the Federal State to the amount of € 69.9 million for the torrents, avalanche, and erosion control. Together with contributions from the Federal Provinces and stake holders (municipalities, water corporations, others) funds to the amount of almost € 122 million are thus available annually for investments into active control measures (BMLFUW, 2012a;b). Since the 2002 Floods, Austria invested all together 2.9 billion EUR into protection against natural hazards. According to an action plan called „Flood Safe Austria“ that was accepted in Austria after the 2013 Floods, will the Austrian Federal State invest around 1 billion EUR in the period 2014-2019 into protection of their citizens (BMLFUW, 2016).

Water management funding in Slovenia is based only on national funds. Municipalities do not have their own funds to invest in that sector. There have been some changes in that field, and some municipalities realized that national funds are not sufficient to ensure a good state of water infrastructure and they started to ensure their own budget to finance parts of the maintenance works, mostly parts closely connected with their own infrastructure (municipality roads, sewage systems, water supply systems). But these cases are rather exceptions and such funds do not present amounts worth mentioning in the overall statistics. This is also one of the steps forward that could improve the state in Water management sector in Slovenia.

Figures 1-3 show that Slovenia lags behind Austria, except in years 2008 and 2009 when all the mitigation measures and restoration of water infrastructure after massive flooding in September 2007 were carried out. After 2007 floods occurred in 2009, 2010, 2012 and 2014. Damage exceeded 0.05% of national GDP in 2012. GDP data were taken from the World Bank (data.worldbank.org).

Table 1: Damage on water infrastructure in Slovenia (% of national GDP).

Floods	Damage estimation on water infrastructure in Slovenia (million €)	GDP (billion €)	Share of GDP (%)
2007	91.479	34.594	0.264
2009	23.258	35.556	0.065
2010	116.843	35.607	0.328
2012	194.527	35.700	0.545
2014	52.126	37.300	0.139
Sum	478.232		

After last large flood events in Slovenia the maintenance funding remained on the same level as before (8.5 mil € on the national level); instead the Ministry prepared restoration plans and provided additional financing. None of these restoration programs reached the planned amount due to lack of financing in the following fiscal years and due to new flood events. Despite financing problems these restorations programs improved state of water infrastructure in flooded areas. Numerous check dams and retention dams were built on small torrential tributaries, since sediment transport and woody debris were one of the most pressing problems during past flood events. Nevertheless, mostly were these measures rather a first-aid than actually improving the flood-safety situation.

In the end of 2014, after the fifth massive flood in 8 years, the new government set the flood protection and good condition of water infrastructure as its top priorities. Government prepared so called action plans which should improve the state of water infrastructure in Slovenia (see Fig. 6 for an example of a neglected and therefore damaged check dam) and reduce flood hazard. This action plan was divided into four major chapters (MOP, 2014):

- The first part was short term measures to compensate lack of maintenance in the past years with amount of 11.9mil €. In 2015, only 11.1mil€ of the action plan was carried out due to lack of annual financing. Majority of the financing was used to carry out the restoration measures in the recently flooded areas. So, the first part of the action plan turned into another remediation program, as we know them in the past to remediate devastated flooded areas.
- The second part of the action plan was an increase of the regular maintenance funding for water management to at least 25 mil€ on the national level per year. Also according to our interpretation, the annual maintenance budget in Slovenia in the field of water manage-

ment should raise from 8.5 to 25 million € per year – this is ~3% of the estimated value of water infrastructure in Slovenia of around 800 million €. In 2015 that was not applied and the maintenance budget stayed the same as in the last few years (7.6 mil €/year). The third part (the last part related to water management, since the fourth part is related to road infrastructure damaged in floods) of the action plan was long term measures including administrative changes, changes of national funding and greater focus on EU funding of measures to reduce flood hazard.



Figure 4: A degraded check dam on the Belca torrent in NW Slovenia.

On administration level the Parliament of Slovenia in July 2015 accepted an amendment to the Water Law (ZV-1E, 2015) and established the Directorate for Waters of the Republic of Slovenia (DRSV) that will start its work in January 2016 as a constitutional part of the Ministry of the Environment and Spatial Planning. The situation could have been better, if only we have succeeded to raise more than only 22.5% of the available EU structural funds to be spent in Slovenia for these purposes in the period of 2007-2013. The Directorate for Waters will be a stand-alone fiscal user of the ministry budget, and will be in charge for investments in water management in Slovenia – the staff will be recruited from employees of the Slovenian Environment Agency (ARSO - <http://www.arso.gov.si/en/>), Institute for Water of the Republic of Slovenia (IzVRS - <http://www.izvrs.si/?lang=en>), and internal units of the Ministry of the Environment and Spatial Planning (MOP - <http://www.mop.gov.si/en/>),

especially the Water and Investments Directorate. The main reason for the directorate establishment was reaching findings that flood hazard in Slovenia is increasing rather decreasing (after the last few major floods), and the water management organisation was claimed to a large extent to be one of the major reasons for the present unsatisfactory situation. What concerns about new Directorate is that it brings only administrative changes with existing experts and mostly officers and does not bring necessary professional strengthening to water management sector.

As a basis for a more effective work of the future WD will be a Water Management Strategy – to be prepared before the end of 2015 . Part of it is also a Flood Risk Management Plan 2016 – 2021 (MOP, 2015) and Basin Management Plan for the same period, among other documents. The Flood Risk Management plan (National plan for flood risk reduction) recognizes 61 locations with high flood risk where implementation of mitigation measures should be a priority. In last 25 years flood caused 1,800 million € of direct damage, only in last 10 years 1,200 million € of damage. On average in Slovenia floods cause 150 million € of damage. The main question that remains is the scope of funding in the future. No administrative change can basically ensure reduced flood risk without increased and effectively spent funding. An important step in the past was done by establishing a web platform called eVode (<http://evode.arso.gov.si/>), where stakeholders can find different evidences, studies and other data on water use and water management. A part of these publically available data are now also LiDAR data for the whole area of the Republic of Slovenia, which is a very advanced approach and enables wide usage of high resolution data for flood hazard mapping, spatial planning etc. Also an important ongoing activity is the determination of water areas. Based on the Water Act, a water area is an area with permanent or occasional water presence (stream channels) including flood areas (flood plains) and areas close to watercourses till first geomorphological change – tough, water areas are not covering full river corridors. This project includes cooperation of water management and geodetic experts and will provide very valuable data layer which will be important in the process of spatial planning.

WATER MANAGEMENT AND CONSTRUCTION SECTOR IN SLOVENIA

According to the Standard Classification of Activities (version 2008), water management is part of F. Construction (in former Yugoslavia, water management was a separate activity outside construction) – Construction sector is subdivided to:

- F41. Construction of buildings,
- F42. Civil engineering (among others F42.91 Construction of water projects) and
- F.43 Specialised construction activities.

The peak number of employed workers in construction sector in Slovenia was in October 2008 with over 92,000 (more than 11% of all employed persons in Slovenia) and the value of the executed construction works in 2008 in Slovenia was estimated at 3,551 billion EUR (1,727 billion EUR for civil engineering) – this dropped down to 1,927 billion EUR in 2014 (1,269 billion EUR for civil engineering). In 2015, Slovenia has already signed first 5 projects in the field of drinking water supply and collecting and treating of waste water for over

150 million EUR to be partially co-financed from the European Structural Funds and the Cohesion Fund in the 2014-2020 programming period. In the field of flood protection projects, the available funds in this period are estimated to 600 million EUR; an amount to be of importance to revive the construction sector in Slovenia, where large investments into highway construction has recently stopped (the value of close to 800 km highways and motorways in Slovenia is estimated at 6+ billion EUR – for comparison purpose: the value of close to 10,000 water management structures in Slovenia is estimated to close to 800 million EUR). The realization of these Cohesion Fund projects still depends on the success of Slovenian bureaucracy which has prevented the realisation of 2010-2015 period projects for the first three years and thus the majority of projects started only in the second part of 2013; a fact that additionally hit the Slovenian construction sector in the past 5 years.

CONCLUSIONS

Considering very poor condition of water infrastructure in Slovenia and very high flood hazard, water management and flood mitigation measures must become one of the top priorities in years to come. Previously described administrative changes in Slovenia are a step forward and rule out the administrative obstacles for efficient water management in Slovenia. But for now (early 2016) all these changes still did not bring the necessary changes in funding. Maintenance is still inadequate and projects for EU funding are still not a top priority of the Government. Increased funding of water management will reduce flood hazard and consequently also help to a certain level Slovenian construction sector to recover after recession in 2009 when the Slovenian national highway project was terminated. The results of our study were presented on two Slovenian national congresses on water management and natural disasters in Slovenia and published in the national journal on Civil engineering (Sodnik and Mikoš, 2013; Sodnik et al., 2015). Authors of the study were actively involved in the preparation of the administrative changes in water management in Slovenia. The state of the mind of the authorities and decision makers must change and maintenance works and flood protection measures must be carried out instead of remediation projects after each flood event.

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