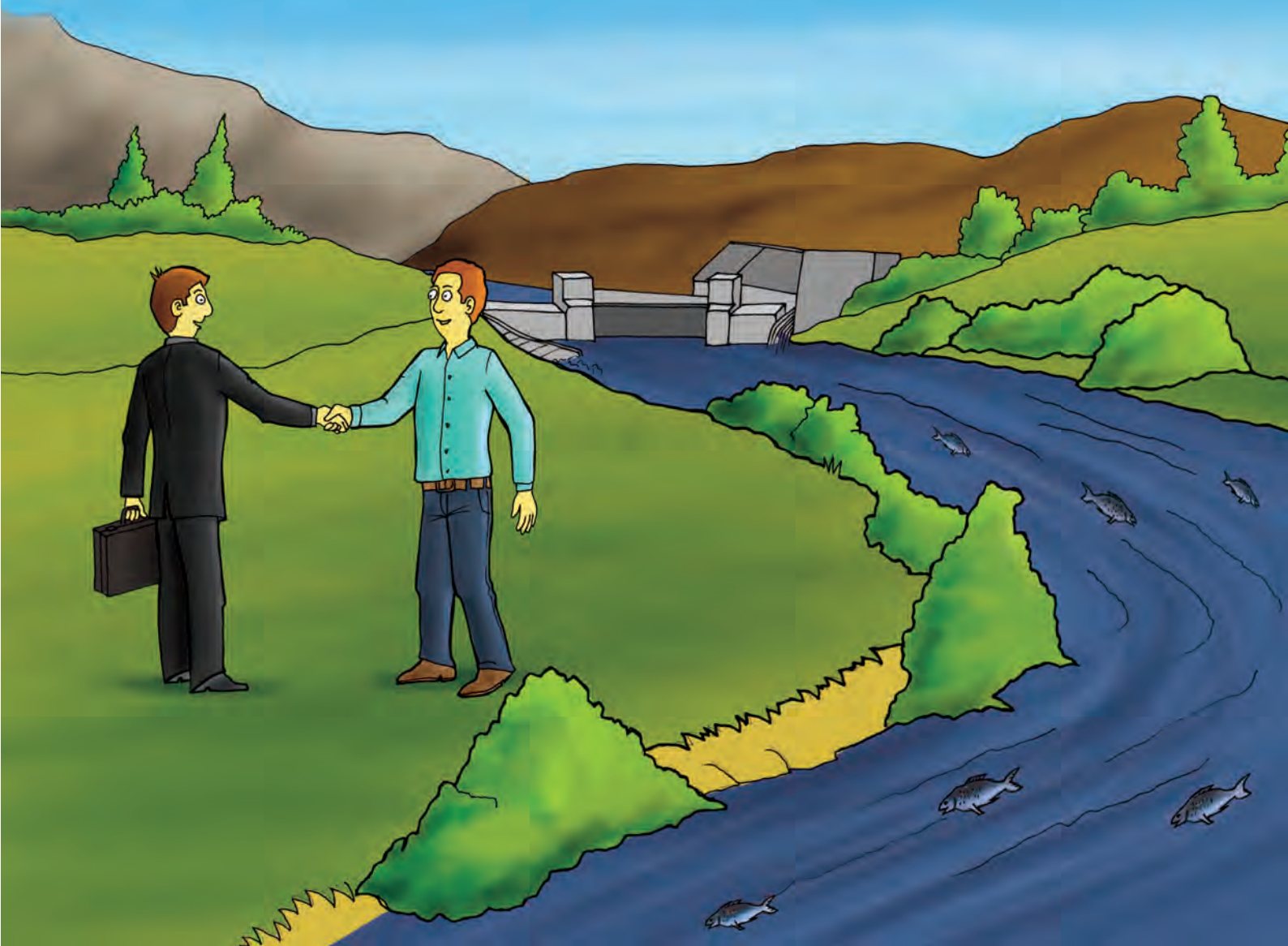
EUROPEAN ENVIRONMENTAL BUREAU

Ten Rivers

A review of Europe's New Water Protection



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The European Environmental Bureau (EEB) is a federation of over 140 environmental citizens' organisations based in most EU Member States, most candidate and potential candidate countries as well as in a few neighbouring countries. These organisations range from local and national, to European and international. EEB's aim is to protect and improve the environment by influencing EU policy, promoting sustainable development objectives and ensuring that Europe's citizens can play a part in achieving these goals.
EEB stands for environmental justice and participatory democracy. Our office in Brussels was established in 1974 to provide a focal point for our members to monitor and respond to the EU's emerging environmental policy.

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EUROPEAN ENVIRONMENTAL BUREAU

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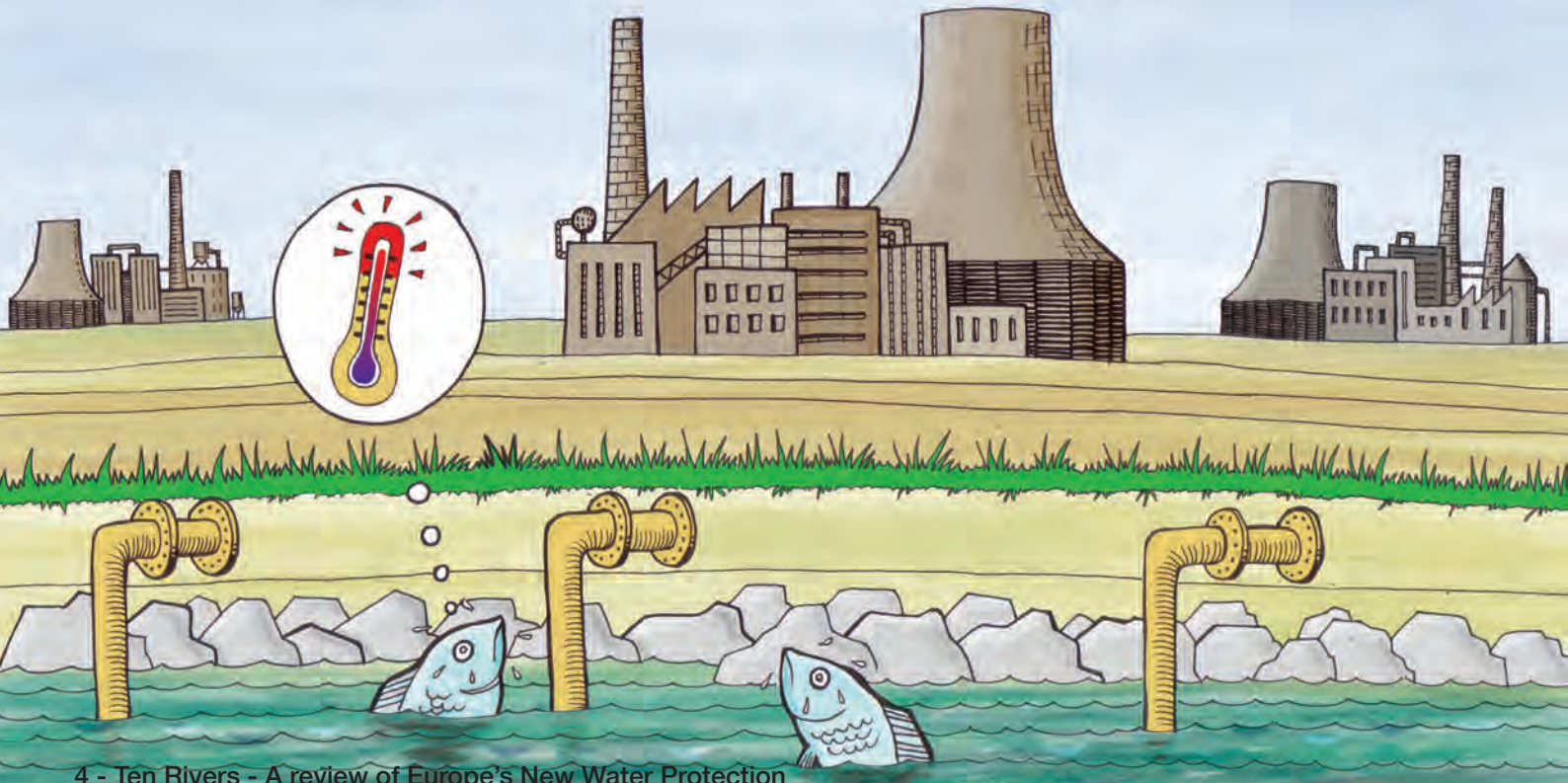


Introduction

The general objectives of the Water Framework Directive (WFD) should be achieved in all surface and groundwater bodies by 2015. After closely following the implementation of the Directive during the last more than 10 years EEB now takes a look at what the directive has achieved. We have selected 10 large European rivers and looked at their current status as well as how the WFD has influenced their situation.

Our assessment shows that thanks to the WFD, rivers are becoming cleaner and the restoration of floodplains and wetlands progresses. Additionally, public awareness and participation improves and stakeholders are working more and more closely together.

However the most important challenges remain the same as those the Framework aimed to tackle ten years ago.

The WFD has not so far been successful in tackling nutrient and chemicals pollution and overabstraction of surface and groundwaters from agriculture. This affects wildlife but also human drinking water quality as well as consumer's pockets by increasing household water bills, too.

At the same time, dams for hydroelectricity generation cause major alteration of river ecology. While the removal or refurbishment of old dams is only progressing slowly a new wave of dam development threatens the remaining few untouched river stretches. Alteration of rivers to enable shipping continuous, despite concerns about the "cleanliess" of this mode of transport. Rivers also suffer from the increasing effects of climate change that amplify the existing problems. River deltas in southern Europe seem to near ecosystem tipping points as a consequence.

These pressures, combined with other issues such as domestic and urban waste water pollution, rising river temperatures due to thermal energy plants, and industrial pollution, make an undistinguishable impact on the rivers and wider environment.

Nonetheless, albeit too slow, progress has been made with some of our rivers. However, this progress is still very fragile and is at risk of being undone. Continuous efforts need to be made in order to ensure full compliance from Member States with the WFD, and as soon as possible. This can only be achieved when the EU as a whole commits itself to its ecological obligations.

Enjoy reading!

Allier: Re-opening the river for Atlantic salmon

#1

The Allier river has its source in the Central Massif in southern France and reaches the Loire after some 400 km. It holds a small, fragile Atlantic Salmon (Salmo salar) population that is able to migrate from the Atlantic Sea up to 1000 km high in the Central Massif. Large parts of the Allier river are designated Natura 2000 sites to protect the salmon and other species and several measures were taken to enable the migration during recent decades.

However the Poutès dam still forms a major, last big obstacle for salmon migration. The dam, run by Electricité de France was built in 1939 and produces hydropower up to 50 GWh yearly (accounting for 0.009% of French electricity production and 0.07 % of French hydroelectricity production in 2010[2]). The dam has been equipped with two fish passes: one for the downward migration and an elevator for the upward migration. But these aren't effective enough and given the characteristics of the river, no further technical improvement is likely to solve the situation.

The dam is situated in a Natura 2000 site in the middle of the major Atlantic Salmon spawning area. The number of salmon in the Allier River decreased from 100 000 at the end of the XIXth century to 400 nowadays. Thus the local population has reached critical levels – the species is close to extinction in the Allier. Environmentalists, including the Minister of Ecology have argued that all other restoration actions that have been undertaken are insufficient. The Poutes dam puts France's conservation objectives under the EU Habitats Directive concerning the Atlantic salmon at risk: the dam needs to be removed if the salmon is to return.

The WFD has helped affected stakeholders (government, the largest hydroelectricity developers and producers, municipalities, conservationists, fishermen) come together in roundtable talks (the so called "Grenelle Environment Forum") which signed an agreement about reconciling renewable hydropower development and nature conservation goals. Concrete targets and measures for hydropower development, water quality and nature conservation were fixed.

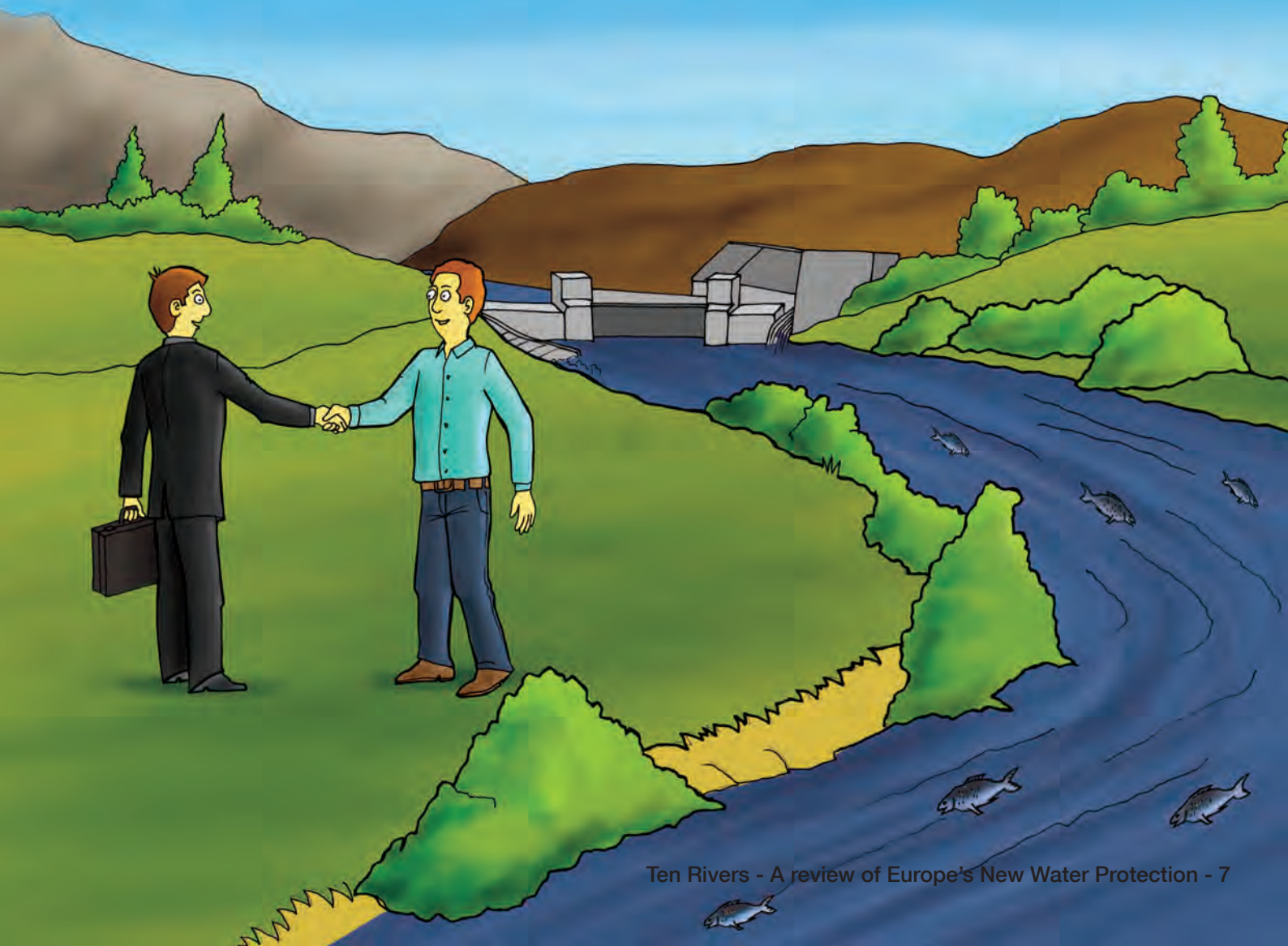
One of the results of talks is that agreement was reached that the 17 m high Poutès dam will probably be dismantled in 2013 and replaced by a fully removable, 4 m high weir which is similar to a dam but allows water to flow over the top. This is a real win-win solution: 85-95% of the electricity production can be maintained while fish migration will become much more effective.

2 Réseau de transport d'électricité (20 January 2011). The French Electricity Report 2010, viewed on 21 February 2012, http://www.rte-france.com/uploads/media/pdf_zip/publications-annuelles/rte-be10-fr-02.pdf

The planned replacing of the Poutes dam with a smaller electricity producing weir is acceptable for the energy company and nature conservationists too.

Outlook for the future

The removal of Poutes dam is a major success in the history of the WFD and the EU Habitats Directive. It shows that through discussion and negotiation, a solution can be found that is acceptable for Electricité de France (EDF) as well as conservation NGOs. The Water Framework Directive clearly helped to start this process and to enable civil society to influence the national energy strategy for the better. While some minor obstacles are to be removed and water quality has to improve to complete the project, environmentalists and the European Commission now look to France to see the promised dismantling of the Poutes dam to take place as soon as possible.



Danube: River or shipping highway?

#2

The next 3-5 years are decisive for the fate of the Danube, Europe's green corridor. The largest European river stretches some 2800 km long from Germany's Black Forest to the Black Sea. Its middle and lower stretches are still characterized by natural river banks, floodplains, and riverside forests rich in bird and fish. The Danube boost a wide range of endangered fish species, among them sturgeon and the Danube salmon. Tourist ships; people fishing and swimming dominate the picture in the summer while large transport vessels are missing. However a new wave of infrastructure development is now threatening to turn the river into an industrial axe.

The Danube and its tributaries collect water from some 800 000 Km2 - an area equal to the size of Germany, Poland and Greece together. Over this huge area, different challenges are present ranging from industrial, urban and agricultural pollution to river regulation and many more. The river has been modified a lot in the past, however instead of restoring the river to achieve the WFD objectives a new wave of destructive development is threatening: the development of the Danube as a transport corridor as well as dam development in its tributaries.

The Danube has been defined as "Pan-European Transport Corridor VII," a priority axe of the EU's Trans-European Network for Transportation. Some 1000 km on the middle and lower stretches of the Danube have been identified as "bottlenecks" and are proposed for elimination. Many of the proposed navigation measures are ready for implementation and will likely go ahead in the next few years. The targeted sections are the remaining natural river stretches which are of high importance for river ecology and biodiversity. These natural values have been confirmed by designation under national and EU legislation.

Germany has a large fleet and will benefit from shipping made possible from Rotterdam to the Black Sea, but most middle and lower Danubian countries have no transport ship fleet. These countries will carry the environmental burden of the "development": lowered water tables resulting in drinking water supply problems and reduced agricultural output, destroyed riverside ecosystems and decreased recreation and tourism opportunities.

In a joint statement NGOs have showed that a more sustainable development of shipping would be possible through the modification of the ships to fit to the river rather than adjusting the river to the ships. Nevertheless this approach has not been taken up by decision makers.

Besides navigation, hydropower development provides the biggest threat for the Danube. This means that the Upper Danube (until Bratislava, Slovakia) is interrupted on average every 16 km by a dam. Very few stretches can still be characterized as free-flowing here and the effects on river ecology and biodiversity are considerable. On the lower stretches there are 3 main dams, (the Gabcikovo dam below Bratislava and the Iron Gate I and II complex in Romania/ Serbia). However there are still plans for more dams to be built, for instance on the Bavarian Danube, and on the undisturbed, beautiful stretches of the Sava and Drava rivers along the Croatian-Hungarian border. The Novo Virje dam on the Drava would break up the still largely pristine 370-km stretch of the river.

WWF has mapped the potential for floodplain restoration along the Danube . 2,236 km2 of floodplains in Hungary, Romania and Bulgaria could be restored. The costs amounting to €50 million would be offset by benefits in flood protection, water purification and tourism reaching €112 million. As 70% of the Danube floodplains have been destroyed or disconnected in the past, such measures would be very important. Unfortunately, measures are mostly postponed to later cycles of river basin management planning using the possibility of time exemption under the WFD.

3 Save the Danube as a lifeline! – steps towards sustainable navigation. Common NGO position on navigation in the Danube basin 15 October 2009

4 Assessment of the restoration potential along the Danube and main tributaries, Ulrich Schwarz, FLUVIUS, Vienna, May 2010

Outlook for the future

The next few years represent a historical tipping point for the Danube. If the EU wants to achieve its environmental objectives it should maintain the Danube as ecological corridor instead of converting it into a transportation and industrial axe. A real sustainable strategy for the Danube is needed including regional as well as European aspects of transport, energy, agriculture, tourism, fisheries and flood management. The Danube biodiversity strategy should be the core element and basis of this overall sustainable development strategy. The new destructive infrastructure developments for navigation, hydropower and flood protection should not be supported by the EU and the ICPDR countries.

Graphic inspired by WWF DCP

Ebro: A nation's life line drying up

#3

The Ebro is one of the biggest rivers in Spain. Its water feeds six of Spain's autonomous communities and five million people. In the last 50 years the amount of water in the river was reduced by 50% as a result of overuse and climate change. Currently, there is a run for water: those with power try to get their hands on as much water as they can while the less powerful rally the streets and demonstrate to ensure a fair dialogue.

In the past water followed money and power. This trend has been stopped by the introduction of the WFD, but climate change and diminishing water provide a new challenge to be solved.

The agricultural industry is one of the main users of water. There is already 900 000 hectares irrigated agriculture in the river basin but the expansion of irrigation on further 400 000 hectares is planned. This seems to be an irrational idea in view of the long term climate change scenarios. However this is of little interest to the farming industry which benefits from big profits from selling maize and fodder. Farming lobby groups claim a right for water and have a powerful influence on politics in Spain.

Another idea that is repeatedly proposed is to transfer water through pipes to other far flung regions of the country. Although technically feasible, this proposal doesn't take account the needs of ecosystems and local communities who need the water there where it is. While local groups managed to stop water transfer projects so far this idea is likely to come up again in the future.

Sediment (sand and gravel) transported by the river naturally is held back by dams. For example as much as 95% of solid material is kept back by dams in the Ebro. River water is reduced by the numerous water users. This lack of sediment and water transport becomes obvious in the Ebro delta, which is designated as a protected area under international (Ramsar) and EU legislation. It is one of the most important feeding and breeding site for migrating birds in the Mediterranean basin. Because of its unique value for global biovidersity, it has been proposed that the Delta be declared a "World Heritage Site by UNESCO. However, as the river doesn't carry as much water and sediment as before, the Delta's ecological balance is disturbed. Irreversible ecological changes could soon take place. Sea water already penetrates the river up to 40km inland, polluting groundwater resources and compromising people's water supply in the region.

Unfortunately Spain is very behind with the implementation of the WFD. River Basin Management Plans (due in December 2009) were likely to be submitted to the EU in 2013 only and the draft plans lack essential ecological measures.

Irrigated agriculture uses much of the Ebro's water and leaves little for local communities and nature. But aggressively maintaining current practices will not work for long as the effects of climate change are more keenly felt. Applying water economics better could help to allocate resources fairly.

Outlook for the future

Climate change will determine much the realities in the Ebro basin in the future. To avoid confrontations and pointless fighting over scarce resources in the future a better dialogue is necessary. Improving water saving and better allocation could help. For this, a better use of economic tools (e,g, pricing, metering, taxing) and better regulation are needed.

A moratorium on irrigation agriculture would be a logical next step, as long as better solutions are found. A change of the cultivation systems in agriculture should be considered, as well. EU money should no longer be used to allow irrigation agriculture and other non-climate-proof solutions to spread in Mediterranean countries. Aggressively maintaining current practices won't work for long. The EU should enforce full compliance with the Water Framework Directive and other relevant legislation (Nitrates/Habitats/Birds Directives) to enable southern countries to wisely adapt to climate change.

Elbe: Giving salmon, sturgeon and eel a chance

#4

The Elbe is Germany's third largest river, with its basin extending over 25% of the country. Enormous improvements of the river's water quality have opened prospectives for the reestablishment of vital populations of once abundant migratory fish. Long distance migrators like salmon and eel need biological continuity – from the headwaters of tributaries to the Elbe mouth north of Hamburg. The Elbe River Basin Management Plan proposes the construction of more than a hundred fish passes in large tributaries. Unclear funding, water quality problems caused by dredging in the tidal Elbe up to the Hamburg port and a dam project in the upper Elbe at Decin in the Czech Republic could jeopardize the success of these aims.

The fish fauna in the Elbe river suffered from the disastrous effects of hydraulic engineering for navigation and flood protection as well as from extreme pollution in the 20th century. Some stretches were even classified "ecologically dead" in the early 1990s. Since then, pollution has been drastically reduced.

Even long distance migrators now have a potential for recovery, if continuity of fish migration routes and the rivers' morphology are improved throughout the river basin. The formerly extinct salmon (Salmo salar) and Atlantic sturgeon (Acipenser sturio) are being reintroduced. Among the other migratory fish species whose populations now have a potential for recovery are sea trout (Salmo trutta trutta), allis shad (Alosa alosa) and as well as the common barbel (Barbus barbus), a species that migrates within the river system.

The River Basin Management Plan (RBMP) for the German part of the Elbe basin identifies those Elbe tributaries with the highest importance for fish migration. The 10 federal states in the basin agreed on a list of some 130 weirs and locks in these priority rivers that have to be equipped with fish passes until 2015. This goal can be regarded as one of the most important ecological improvements that the RBMP foresees. However, funding still needs to be secured. In parallell, since 2008, the federal inland navigation agency is obliged to guarantee biological continuity of its locks and in 2012 presented a concept for improvements to be realised in the coming years – an important step forward triggered by the Water Framework Directive.

A major obstacle to fish migration is caused by periods of drastic oxygen depletion in the summer. Oxygen levels in the tidal stretch of the river regularly drop so low that fish migration is effectively blocked. These so called "oxygen holes" are mainly a result of the artificial deepening of the riverbed up to the port of Hamburg located some 100 km upstream from the North Sea. An estimated 9 million cubic meters are dredged every year. The intended deepening of the navigation channel to 14,50m will require even more dredging. Environmentalists have pointed out that this will negatively affect Natura 2000 sites and protected species and violate EU water and nature legislation. Nevertheless the European Union in late 2011 approved a further deepening. The intensive use of river water for cooling of thermal and nuclear power plants exacerbates the problem: as the river is artificially heated up, oxygen saturation drops.

Secondly, the ongoing discussion about the future of the Elbe river as a waterway also plays its part: the existing fleet is not able to cope with the hydrological regime in the river. The Czech Republic plans to erect a dam in the Elbe at Decin and expects Germany to guarantee year round navigability to Hamburg. Some federal states also call for improvements for navigation. In the "Prague Declaration", the German and Czech Chambers of Commerce Republic called on European institutions to include the Elbe river in the TEN European navigation projects. At the same time however, the Elbe in Germany has – in line with its economic insignificance – in parts been ranked as only "peripheral" within the inland waterways network in 2010.

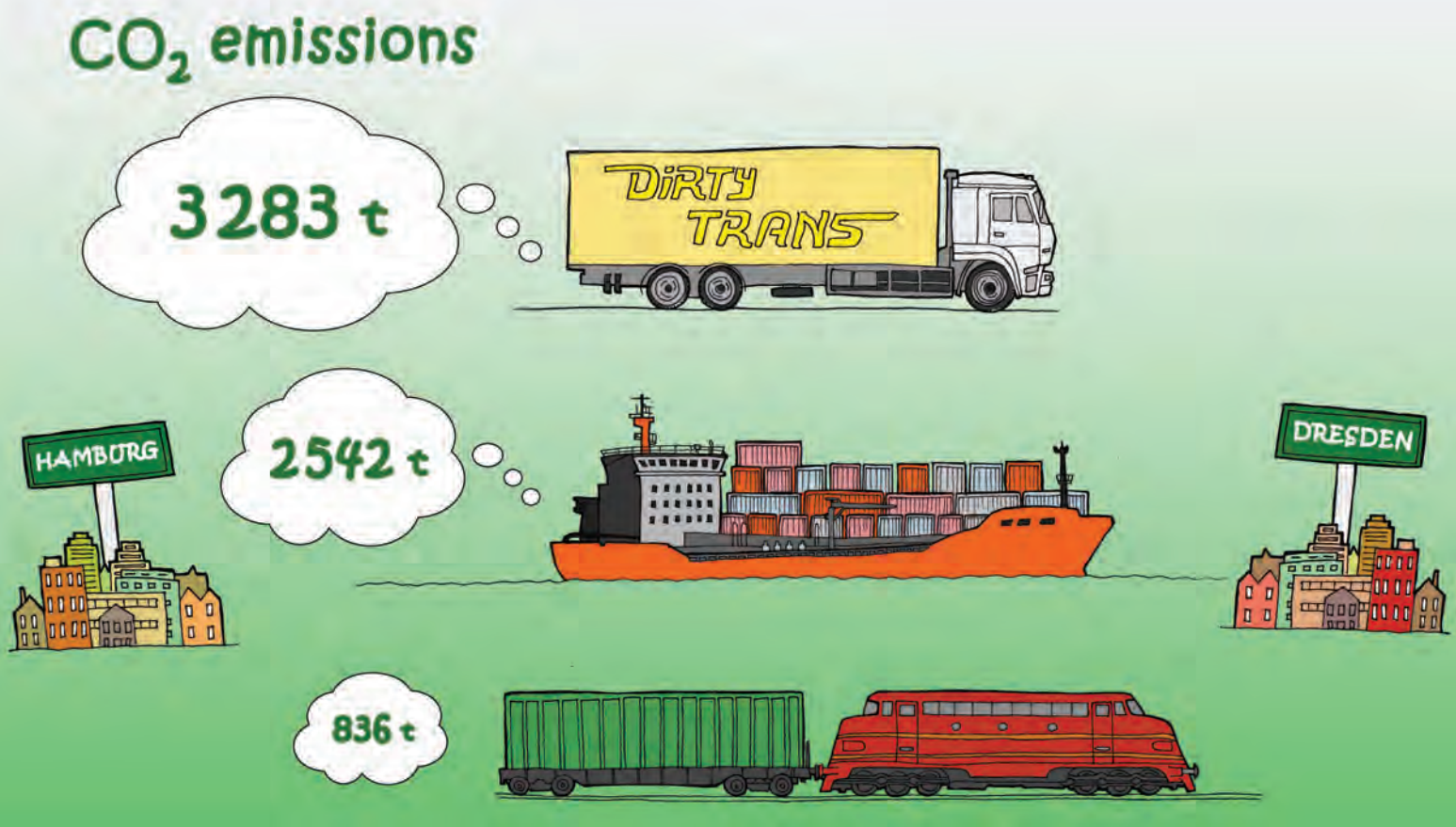
5 Calculation was made using http://www.ecotransit.org/ecotransit.de.phtml

Shipping is claimed to be "clean" and climate friendly. However an analysis[5] shows that on a route from Hamburg to Dresden a ship emits only little less CO_2 than a truck and still much more than a train.

Outlook for the future

River flows in the Elbe do not allow for year round navigation: Low water periods are common and are expected to occur more frequently with climate change. Average flows in spring and July are already decreasing. Continued maintenance of the waterway increases erosion of the river bed, and new embankments destroy riparian habitats. Both fish fauna and terrestrial biodiversity would immensely benefit if more space was regained to allow for more natural river dynamics and the restoration of floodplains.

It remains to be seen whether the Elbe concept now initiated by the German federal government will favor more intensive hydraulic engineering to support economically questionable navigation or whether it will lead to a turn towards a more natural river.



Guadalquivir: Trying to keep pace with climate change

#5

The Guadalquivir in southern Spain was an inspiration to renowned poet Federico Garcia Lorca and others. However today Guadalquivir is more remembered for its many urban centers and agricultural areas. The effects of climate change are already very much felt. Water amounts are expected to decrease 12% by 2030 due to climate change while water use is expected to rise to 50% of the renewable water amount by 2015. However policy making seem to be lagging behind with answers.

The Guadalquivir is a typical Mediterranean river with a high degree of variability in water flow due to scarce and erratically distributed rainfall (dry long summers and occasional episodes of torrential rains). There are around 150 protected areas in the Guadalquivir river basin including the emblematic Doñana wetland in the estuary. Doñana is designated a Ramsar international wetland; SAC and SPA under European nature legislation and UNESCO World Heritage site and MAB Biosphere reserve. More than 300 migratory birds species - like the pink flamingo or the imperial eagle – live here. Also it provides a habitat to the most threatened feline in the world: the Iberian Lynx of which only some 100 animals are left in the wild. (Some 25 animals live in the Doñana). Around 1,300 plant species can be found in the river basin of which 24 can only be found here on the world.

The river suffers under many different pressures. Agriculture uses over 80% of the available water resources in the basin, with an estimated irrigation area of over 800,000 ha. Even olives –traditionally a rain-fed product – are irrigated. According to official figures several thousand illegal boreholes are used for irrigation depleting groundwater resources.

The Spanish Government has implemented a Modernisation of Irrigation System Plan, e.g. eliminating open channel irrigation and introducing metering. However farmers still only have to pay part of the costs of using water. Much of the cost of maintaining and cleaning water polluted by agriculture is transferred to the taxpayer through the water bill. There is no overall framework and priorities to distribute the available water. Because demand for new irrigation areas steadily increases, the savings achieved by modernization are eaten up by growing demand.

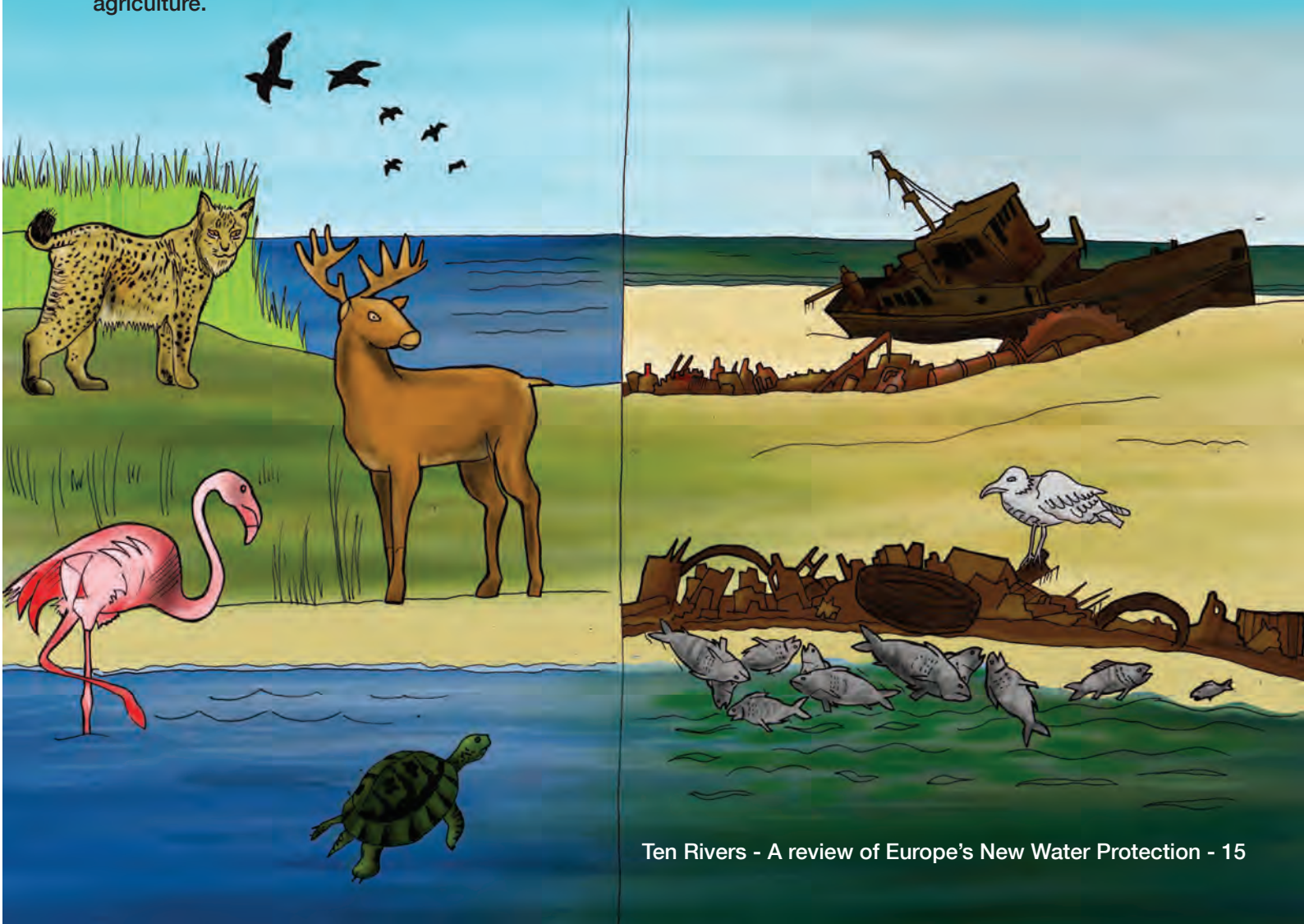
Urban and industrial pollution also represent a ubiquitous problem. More than half of the cities and industrial sites' waste water is not adequately treated and in some coastal and transition waters sewage is discharged directly into the water, including hazardous substances. In 1998 a dam failure in a mine caused a major 5.5 million m3 toxic spill.

All these combined pressures have left 41.6% of the river and its tributaries with no fish population. Migratory species have been specially damaged also by dam construction and some, such us Acipenser sturio, have completely disappeared. Endemic fish species are vulnerable or at risk of extinction. The eel populations have been reduced by 98% in the last 30 years and their captures have just been banned. The Guadalquivir River Basin Management Plans has not been adopted yet. However, the current draft plan comes short in answering the most pressing issues and delivering a solution to the water scarcity problem.

If the current trend of water overabstraction, agricultural, industrial and urban pollution and urbanization continue the unique ecosystem of the Doñana wetland in the Guadalquivir estuary risks collapse in the short/medium term.

Outlook for the future

The Guadalquivir cannot withstand the combined effect of current pressures and will be even less able to do so with increasing climate change. If the current trends continue, the Doñana wetland in the Guadalquivir estuary will be at risk of collapse in the short to medium term. The reorganisation and rationalization of water management in the whole river basin is urgently needed with the view of adapting demand to the resources. First and foremost, water use priorities and allocations should be established within an integrated management strategy, by looking at surface and ground waters as a whole and respecting future climate change scenarios. The increase of irrigation and illegal water extractions should stop. The right water economics could greatly help to allocate resources fairly. Pollution should be minimized through applying proper measures and technology. Floodplains should be preserved from incompatible uses, such as urbanization and agriculture.



Haringvliet: Reconnecting with the sea

#6

The Dutch Haringvliet connects the Rhine and Meuse rivers with the North Sea, about 10 km south of the Rotterdam harbour. Currently, the dam in the Haringvliet cuts the Rhine and Meuse rivers off the sea, destroying the brackish water ecosystem and preventing fish migration between the sea and the rivers. While upstream fish migration obstacles are progressively removed the front door – the Haringvliet – for the salmon and other migratory fish remains closed.

After some major chemical pollution accidents in the 1970s and 1980's the Rhine countries decided to restore their river. Water pollution was successfully tackled but fish didn't return. It became clear that the many sluices, dams and power stations block the path of the fish. Hence Rhine countries agreed in the 1999 Rhine Treaty to continue improving the ecological quality of the river and to make obstacles passable for fish.

The Haringvliet dam was built after the last flood disaster of 1953 for security reasons. It changed the gradual transition zone between fresh and salty water into a sharp border between river and sea. The unique flora and fauna of brackish (mixed) waters and the original tidal habitats diminished. The dam functions as a locked front door for migratory fish species.

In the Rhine Treaty France agreed to stop salt discharges from its potassium mines. Together with Switzerland and Germany tens of millions of Euros were planned to be invested in infrastructural works like fish ladders. The Netherlands in turn promised to restore the connection between the river and the North Sea through setting the Haringvliet sluices ajar much of the day, so that fish can swim in and out but the flood defence function could be still retained if needed.

However since the closure of the dam in 1969 agriculture around the Haringvliet became dependent on fresh water supply by the river. The part-time opening of the dam would cause salination of farmed areas in the immediate vicinity of the dam. Extensive studies were carried out which confirmed that freshwater for farmers can be supplied from further inland, while taking into account needs of ecosystems and local communities from where the water would be redirected. The necessary infrastructure works for water transfer were largely completed during the last decade.

Thus the statement of the new conservative government in 2010 to stop the works and not to open the Haringvliet dam came us a surprise. The government gave in to local farmers who are afraid of the salinization of the land and hoped to save 15 million Euros while forgetting that 20 million have already been spent in the Netherlands only.

But the Dutch government received serious international criticism from the governments of Germany, Switzerland, Luxemburg and Belgium which reminded the Netherlands of mutual obligations and to keep international agreements. National and foreign nature and fishery organizations led by the Dutch NGO Natuurmonumenten protested. The European Commission reminded the Dutch government of their WFD obligations. Due to the pressure the Dutch Parliament in late 2011 finally decided to open the dam. However they postponed the measure for 2014 the latest, while in the original plans the opening date was set for 2007. Hence, local farmers' interest will be fully met while EU obligations under the WFD and Habitats Directive won't (the WFD prescribes that measures should be operational by the end of 2012). Also, in exchange for this decision previously agreed plans to restore former riverbanks along the Haringvliet were cancelled.

Rhine and Meuse countries have invested significantly in restoring the ecological status of the rivers. Now it is up to the Netherlands to fulfill its international obligations and partly open the Haringvliet dam to reconnect the Rhine and the Meuse with the sea.

Outlook for the future

The restoration of all natural processes in the Haringvliet estuary is the best solution from both ecological and flood defence point of view. It would bring back the natural balance of brackish ecosystems and salmon could again swim from the sea to the Swiss mountain brooks, and many other small ands bigger animals, fish and birds would thrive. A restored natural sedimentation process would help maintain the shores of the Haringvliet ensuring greater safety against rising sea levels. From many alternatives, natural restoration is the cheapest option to achieve these goals. The transition to salt-water tolerating agriculture could provide a solution for farmers instead of rigid opposition to change.

Mur: Selling nature down the river

#7

The Mur has its source in the Austrian Alps and flows through the provincial capital of Graz. It reaches the Danube close to the Austrian-Hungarian-Croatian-Slovenian border. Hydropower makes 2/3 of the electricity generated in Austria. The Mur and 80% of Austrian rivers are dammed with few free flowing rivers and little remaining hydropower potential to be developed. However, European renewable energy targets have motivated the governments to build new dams in the last untouched areas, as well.

On the 300 km Austrian stretch of the Mur, there are already 30 dams producing energy. Only 26 km around the city of Graz are still free flowing. This part gives shelter to some alpine fish species adapted to free flowing clean rivers, such as the huchen or Danube salmon (Hucho hucho) This fish is native only in the Danube and its tributaries and is adapted to fast-flowing, clean and cold mountain rivers. Today only a few populations of the huchen are left. Most populations are maintained by stocking by man, naturally reproducing populations have become very rare. The species is endangered according to IUCN Red List criteria. Hydropower development, which alters the river flow is the major threat for the species. Other fish found here are the grayling (Thymallus thymallus) or Souffia (Leuciscus souffia). Because of the different fish species the river was nominated as a national priority area to achieve the objective of the Water Framework Directive. The survival of the huchen is also essential to achieve the European Target to halt the loss of biodiversity by 2020.

Quite shockingly, the regional government has decided to build five new hydropower stations just in the remaining 26 free-flowing kilometers of the river. Common interest and the fight against climate change are claimed. However studies show that the amount of energy produced would be rather small, (e.g. in comparison to the production in the existing gas-fired plant in Mellach south of Graz) and not necessarily needed in the region or Austria.

However the new dams would mean an end to the huchen. Fish ladders will not provide a solution as the species is adapted to free and fast flowing rivers. Five new dams would change the river into a series of lakes not providing a suitable habitat for the huchen and its prey. According to local assessments, some 21 species could disappear from the river altogether.

Renewable energy is the future but it should not be realised at the expense of the last remaining untouched river stretches of Europe. Renewable energy should only be produced if it satisfies real needs and not our growing energy demand.

Outlook for the future

At the root of the problem is a lack of strategic planning on regional as well as national level. Strategic planning should assess both the ecologic and electricity potentials in a balanced manner. Pushing through projects one-by one by making unlawful use of exemptions should be stopped.

A true win-win solution would be provided though prioritizing energy efficiency and energy saving. Austria's national energy saving target according to the National Energy Efficiency Action plan is 80 PJ (22 TWh) by 2016. First, this target should be realized and discussions should be had about if further new infrastructure is needed. Prioritizing energy saving and energy efficiency and supplying only the real national demands makes common sense while production of excess for export does not.

Rhine:
Boiling up

#8

The Rhine is one of Europe's largest rivers flowing though six countries from the Alps in Switzerland to the Atlantic sea in the Netherlands. It is the most utilized river in Europe: industry centres and energy production plants follow its course. Annually, some 200,000 vessels cross the German-Dutch border transporting about 200 million tons of goods. While industrial pollution seems to be an issue of the past today dams and heat pollution prevent the salmon from repopulating the river.

Dozens of power stations and hundreds of industries use Europe's biggest river as cooling water, emitting up to 20 Gigawatt of heat. As a consequence, the Rhine is 3°C warmer today than it was in 1900. Of this, 2°C are caused by industries and 1°C is due to climate change. The number of days per year on which water temperatures rise above 25°C is continuously growing.

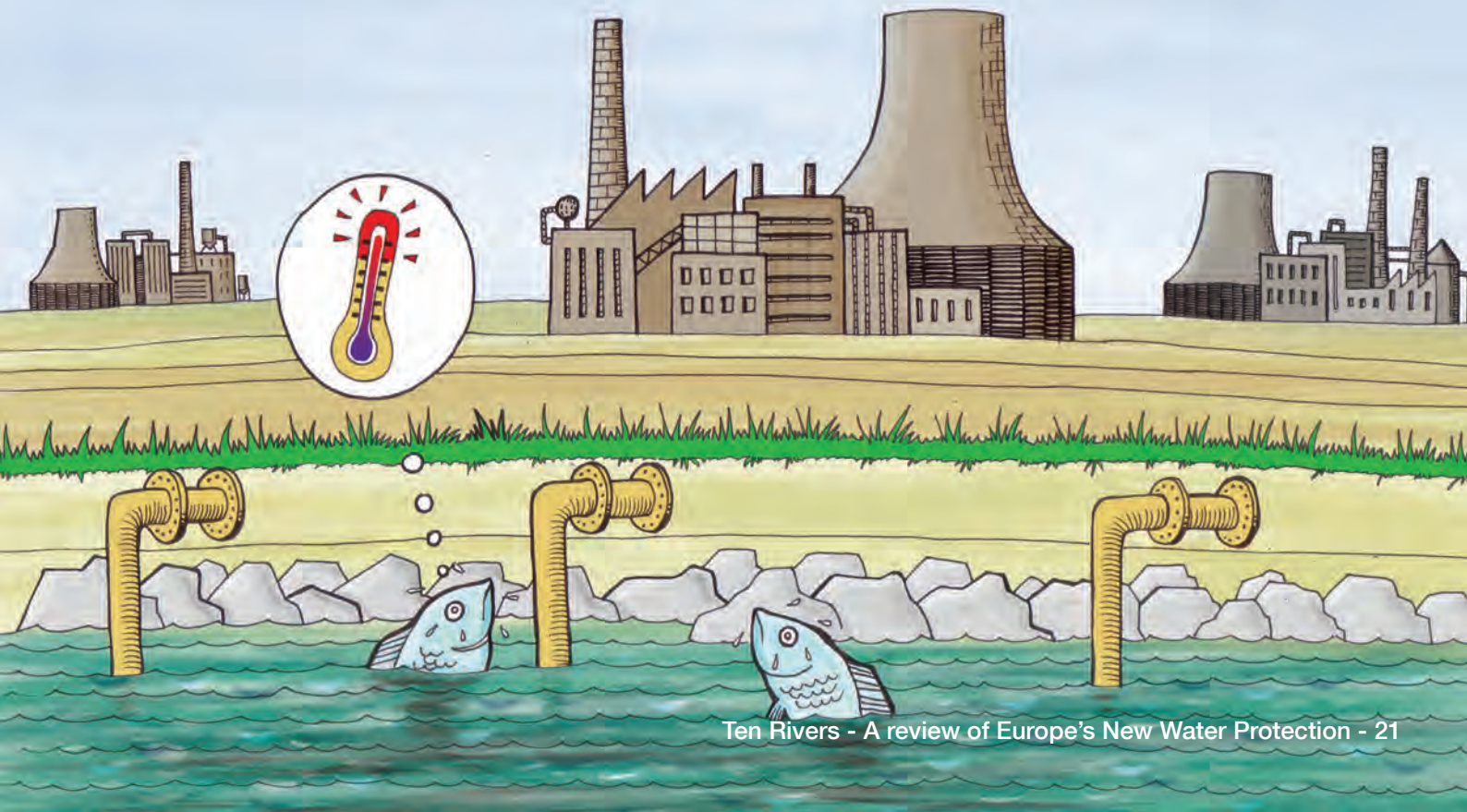
This is a problem for the Atlantic salmon and other temperature-sensitive fish, which stop their upstream migration when the temperature reaches 23-25°C. If nothing changes then the water temperature will keep on rising. This is a slow process, but together with the changes in climate it will make an impact.

EU and national policies have yet to respond to the temperature problem. The current River Basin Management Plan for the Rhine doesn't include measures to tackle this issue and the authorities expressed that they wish to engage with the problem when drafting the second round of River Basin Management Plans (2015). However, before permitting and building of the new power plants an assessment should be done of how much temperature increase can be tolerated to safely achieve the WFD's ecological objective.

Hundreds of industries, power stations and climate change have warmed up the Rhine so that it is 3°C warmer today than it was in 1900.

Outlook for the future

The shutting down of nuclear power stations is good for the water temperatures but this positive effect could be again eliminated by new thermal power stations. Instead of new coal and gas power plants which require aggressive energy saving measures, renewable energy development is to be preferred. The problem of water heat must be discussed by the Rhine countries who already signed an agreement to remove obstacles of fish migration in the Rhine. Also, the problem of rising water temperatures has to be tackled by future EU policy making. New temperature standards adapted to the needs of fish could be an adequate solution.



Vantaa: From a city sewer to a protected habitat

#9

Vantaa is river in the south of Finland that flows through Helsinki and pours into the Baltic Sea. There are one million people living in the river basin. Ecosystems of the river are recovering slowly from the huge pollution the river suffered during 1970s. Today it gives habitat to salmon and trout and the rare Natura 2000 mussel species, the Thick shelled river mussel (Unio Crassus). The river and its surroundings are frequently used by many of the capital area residents for swimming, fishing, canoing etc but the spread of the city and pollution from urban and agricultural areas compromises water quality.

When there is strong flow of storm water – for example when the snow melts in spring time or during heavy rainfall – the capacity of municipal sewage treatment plants is exceeded. Sealed urban areas prevent rainwater from infiltrating the soil and the canal system transports a large amount of water to the water treatment plants. In this case, the overflowing sewage plants release untreated wastewater into the river.

Wastewater contains high levels of bacteria and viruses causing a poor hygienic state. Restrictions have had to be put in place to limit swimming in the river. Also the presence of antibiotics and other drugs can cause unpredictable problems in the ecosystem and in drinking water.

Soil and nutrients are flushed into the river from agricultural and forested areas in the upper part of the river basin by heavy rainfall and flooding. The numerous ditches on mires, forests, and agricultural land carry flood water together with nutrients too quickly to the river instead of storing and releasing it slowly (run-off problem). The nutrients entering the river cause several problems not only in the river but also in the Baltic Sea. In the sea, high nutrient levels lead to booming algae growth. When water oxygen is used up by the algae they subsequently die en masse together with other fish and plant life. Massive areas are abandoned by any form of life – a phenomenon called “dead zones”. Recent surveys[6] confirm the largest such dead zones on Earth are found in the Baltic Sea, especially in the costal zones of Sweden, Finland, Norway and Denmark.

Salmon and trout can use the river to migrate, but there remain some barriers for migration and some fish bypasses do not function. The sea near the Vantaa estuary is extremely important for the migrating fish. Control of fishing in not strict enough and fishing with nets is not well regulated, especially during fish migrating period.

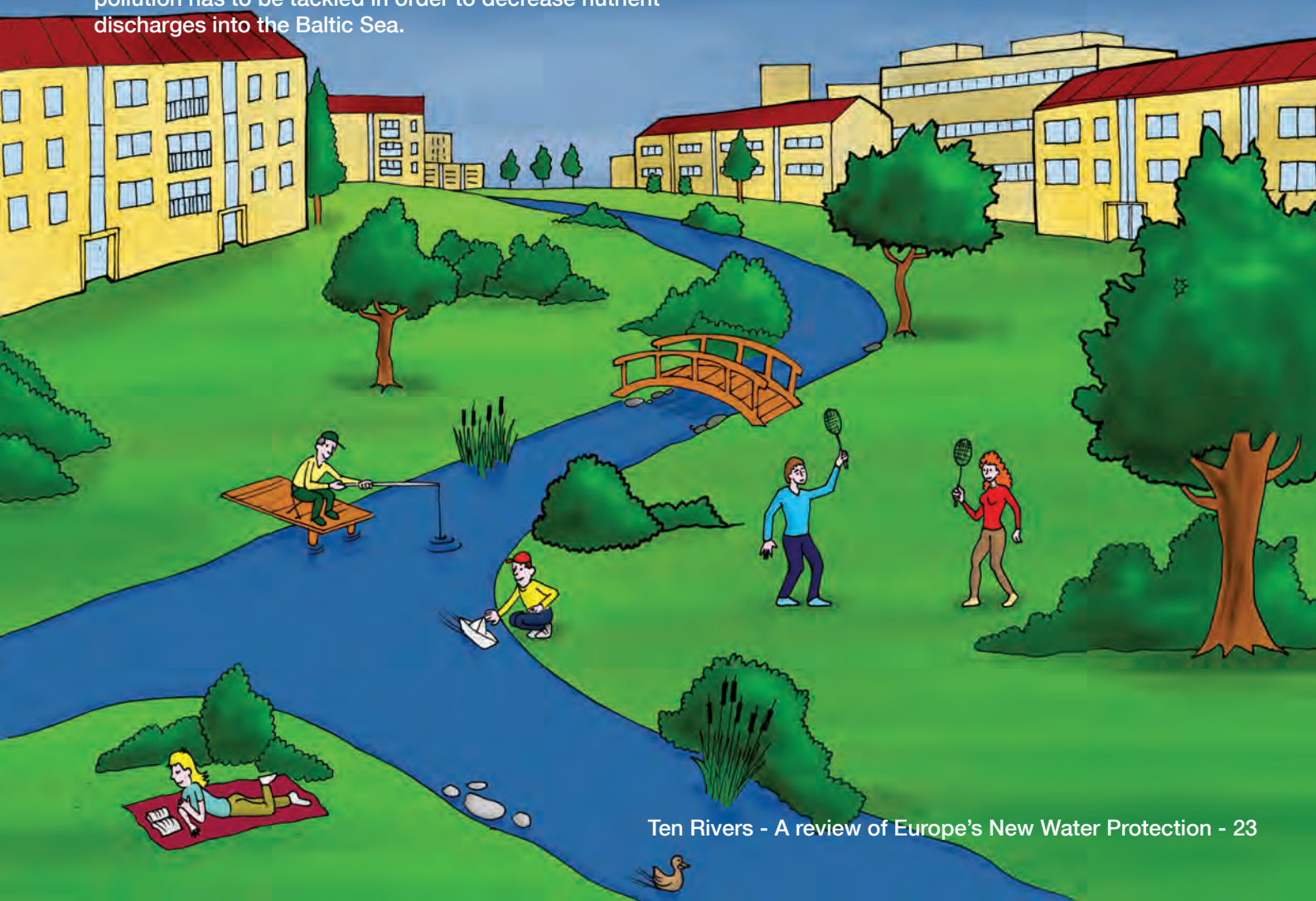
Committed local citizens and NGOs have joined forces and use the Water Framework Directive to help implement action to overcome these problems. The big municipalities of Helsinki and Vantaa have made good River Basin Management Plans and strategies to aid problems. Many measures to manage the agricultural, forest and urban run-off problem have already been introduced. Also ecological restoration of side-streams, the removal of old dams and fish ladders will help wetlands and fish. The revision of land use planning act that is happening now might include better flood and storm management options and better protection of water and wetlands. The RMBPs include ambitious goals for investment for new or upgraded sewage treatment plants.

6 Conley, D.J., Carstensen, J., Aigars, J. et al. (2011) Hypoxia Is Increasing in the Coastal Zone of the Baltic Sea. Environmental Science & Technology. 45: 6777-6783

Land use planning in and around cities has to ensure that floodplains remain unsealed and that more green spaces provide higher water retention during floods and heavy rainfall.

Outlook for the future

The measures suggested in the new RBMP will significantly improve the situation in the Vantaa river basin, but implementation of measures has so far been slow. It has to be ensured that the timely implementation of planned measures dooes not fall victim to budget cuts, because even if all planned measures are implemented, some parts of Vantaa still won't reach good ecological status by 2021. To provide a lasting solution to the existing problems more effective measures need to be taken. The Natura 2000 designation of the river area still has to be completed to protect the river mussels better. Land use planning in and around cities has to ensure that floodplains remain unsealed and that more green spaces provide higher water retention during floods and heavy rainfall. Water retention measures in agriculture and forestry need to be implemented on the landscape scale. Agricultural pollution has to be tackled in order to decrease nutrient discharges into the Baltic Sea.



Vistula: A long way from recognition to action

#10

Vistula is the river of Poland: originating in the Polish Carpathians it winds some 1000 km long through the country. It flows through the capital Warsaw and reaches the Baltic Sea near Gdansk. The river and its tributaries collect water from some 60% of the country's territory. Compared to large rivers in Western Europe the Vistula is still found in a largely natural state. Sandy islands, floodplain forests and side-arms provide habitat for many rare and everyday species. Commercial fishery is still undertaken.

Unlike western European rivers Vistula still has to fight the problem of domestic waste water pollution. 38% of the Polish population lives in small settlements with less than 2000 people where the dominant process of wastewater treatment is still the use of cesspools (septic tanks). Wastewater is .pumped from cesspools to containers to be transported to the nearest wastewater treatment plant (WWTP). This is a very inefficient and relatively expensive system. As a rule the cesspools are being equipped with drainage systems to spread the semi-treated sewerage underground. The cesspools are often overflowing or leaking. According to Vistula RBMP as much as 238 574 tones of BOD [7] and 43 310 tones of Nitrogen and 7150 tones of Phosphorus are annually "produced" and disposed from these imperfect sewerage systems into the Vistula and its tributaries. This is responsible for contamination of ground and surface waters and contributes to the "dead zone" problem in the Baltic Sea (see more in the previous chapter).

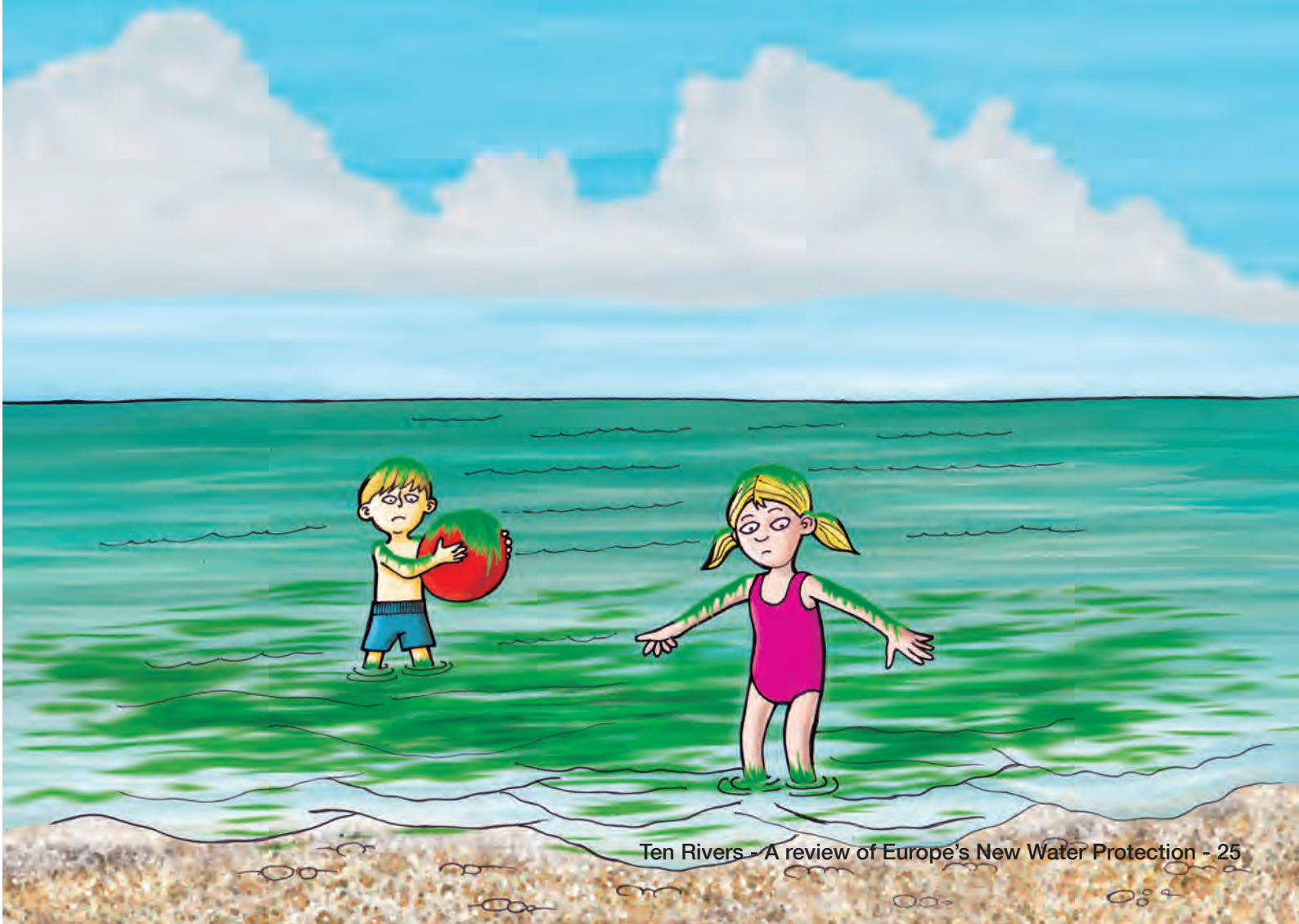
Decentralized, natural wastewater treatment methods, such as wetlands, sand-soil-reed filters, lagoons and wastewater irrigation systems would be a preferable option to solve the problem in small settlements but EU and the national government favor the building of new centralized wastewater treatment plants, despite the fact that small-scale options are cheaper and socially more feasible.

7 Biochemical Oxygen Demand (BOD) is an indicator of the degree of organic pollution in a body of water. The BOD represents the amount of oxygen needed by microorganisms in a body of water to break down organic matter. The higher the BOD, the more rapidly oxygen is depleted in the body of water, meaning that less oxygen is available for other forms of aquatic life.

Domestic pollution is still a challenge in rural Poland. This contributes to the lasting algae bloom problem of the Baltic Sea. Sustainable, decentralised sanitation solutions would be cost-effective and respond better to the needs of small rural communities.

Outlook for the future

The Water Framework Directive helped in the detection of the domestic pollution problem and in establishing new monitoring systems. However measures focus on infrastructure developments in cities and larger settlements. Despite the fact that almost half of the Polish population lives in small villages, laws are not made and funds not distributed in their favour. . EU Cohesion Funds should be shifted to help small rural communities. Socio-cultural and institutional barriers have to be dismantled to allow for sustainable, low-cost, decentralised sanitation solutions to spread. The European Commission and international agreements (such as HELCOM) can help to make Poland respect stricter pollution levels and to enforce the measures planned under the new RBMP.



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