

For life, for the future

Para la vida, para el futuro

Water - a key element in UNESCO biosphere reserves

Experiences from a collaboration of Danone Waters Germany and UNESCO

Pour la vie, pour l'avenir

Für das Leben, für die Zukunft



Edited by the German Commission for UNESCO

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Table of contents

Executive summary	4
What we have learnt: Partner statements	6
Biosphere reserves and water	10
The partnership	18
Summaries of projects funded	22



Biosphere reserves are model sites for sustainable development. Livelihoods often depend on water, such as in the biosphere reserve *Heath and Pond Landscape of Upper Lusatia*. (© Ralf M. Schreyer)

Executive summary

Using the water resources of our planet wisely is one of the central challenges for sustainable development – today and even more in the years to come. This is not an „environmental issue“ – first of all, managing our water resources sustainably and protecting water quality is crucial for human beings and society. In 2010, access to water of adequate quantity and quality has been acknowledged as a human right. Yet, climate change is and will increasingly be felt by human beings mostly because water is becoming scarce; population growth and rising living standards add to the stress on our already scarce and precious water resources.

UNESCO is a key organization in the field of freshwater research and training. Among UNESCO’s key assets are its biosphere reserves as model sites for sustainable development. They are particularly appropriate places to test, evaluate and implement innovative strategies in freshwater.

In order to facilitate new approaches and also in order to mobilize financial resources, the German biosphere reserves have numerous partnerships with the private sector. Over the last couple of years, projects have been supported by enterprises such as Honda, Commerzbank, Merck, – and by Danone Waters Germany.

Danone Waters Germany is the subsidiary of the water division of Danone, a multinational company with leading brands in dairy products, mineral water, baby and medical nutrition. In 2008, Danone Waters Germany introduced a new sub-brand, called “Volvic Landfrucht”, mineral water with a dash of fruit juice. A partnership with German UNESCO biosphere reserves, accompanying the launch of this sub-brand, was a straightforward choice. It allowed explaining to the German consumer the approach of the company to protect the mineral water’s source in the French volcanic region of Volvic. Until today, the bottles of “Volvic Landfrucht” explain on their labels what UNESCO biosphere reserves are, why they are important and which projects are supported by Danone Waters.

In April 2008, UNESCO, Danone Waters Germany and the German Commission for UNESCO established a cooperation agreement for the benefit of German biosphere reserves, until the end of 2010. Danone Waters Germany also agreed to make particular efforts in corporate sustainability during these three years. For example, by 2010, all Volvic mineral water was transported from France to Germany by railway instead of trucks. This cooperation also meets all conditions that the German Commission for UNESCO demands from private partners: That they adhere to the United Nations Global Compact, that they have a convincing track record in

taking sustainability seriously, and that the cooperation builds on authentic corporate strategies, not on marketing.

Danone Waters has provided financial support so far to ten selected projects in German biosphere reserves. Several of these have only started in early 2011; therefore the impact of the cooperation is still unfolding.

The main part of this brochure consists of presenting these ten projects that have been funded over the last three years – with a view to demonstrate best practice in water management in biosphere reserve to our partners around the globe. The projects have been chosen from open calls for proposals and thus cover a wide range of approaches such as education, nature conservation as well as testing innovative technical solutions related to freshwater.

All of these projects have one thing in common: They are projects that could hardly have been funded from government resources, because of legal restrictions or because of political priorities; at the same time, these projects rely on bringing together partners that might not have cooperated under different circumstances.

At any rate, the so far brief cooperation of UNESCO, Danone Waters Germany and the German Commission for UNESCO has already had an important impact on German UNESCO biosphere reserves.



The working group for the project at *Elbe River Landscape* biosphere reserve in Brandenburg, assembling many different partners to improve the water supply to a forest. (© Jochen Purps)

What we have learnt: Partner statements

Lutz Möller **German Commission for UNESCO** **Head of Science, Human Rights**

From the first day, we have been enthusiastic about cooperating with Danone Waters Germany. The cooperation has enabled exciting projects and has reached out to millions of consumers. At the same time, it is a real partnership with the corporate world, not a marketing instrument; the company has convincingly demonstrated real commitment.

Companies such as Danone Waters, that cooperate with us, participate in the "Global Compact" of the United Nations. Thus they voluntarily agree

to embrace and enact ten principles in the fields of human rights, environmental standards, labor standards, and the fight against corruption.

Some people claim that the Global Compact is not enough. Indeed, it is a first step only, but an important and urgently needed first step. At the same time, the Global Compact prepares the ground for more ambitious and maybe one day binding corporate codes, along entire supply chains.

Before we got started, some had reservations about being associated to a mineral water delivered from France to Germany. Rebutting such reservations through concrete action, Danone Wa-

ters has been improving its approach to sustainability. Today, this mineral water is no more transported by trucks, but by train, and thus transport emissions are considerably reduced. Danone Waters today also uses more recycled material in producing bottles than three years ago.



One Danone funded project improved water quality in the Wadden Sea with algae and mussels. (© MaRenate)

UNESCO biosphere reserves on the labels of “Volvic Landfrucht” provides a platform of communication

with the consumer that could not have been achieved by different means.

“Volvic” and “Volvic Landfrucht” are predominantly sold in urban retail situations, where bottled water is the only option to obtain drinking water - at train stations there is no competition with water from the tap. I have personally seen several train passengers studying carefully the information on biosphere reserves on the labels of “Volvic Landfrucht”. No biosphere reserve can afford such massive public relations – corporate partners can be very effective to this end. A public survey about the opinions of the public at large on biosphere reserves, carried out by Danone, provided very helpful insights as well.

At the same time, we are very grateful to Danone Waters Germany for the concrete funds they have provided to German UNESCO biosphere reserves. As will be described further in this publication, the projects that have been and are funded are special in that they would most likely not have been funded from classical government sources. Corporate funds are excellently suited in order to enable “unusual processes” – an observation confirmed also from other private partnership experiences of the German Commission for UNESCO.

Volvic für





The biosphere reserve *Heath and Pond Landscape of Upper Lusatia* (© Ralf M. Schreyer)

Thomas Schaaf
UNESCO, Programme
“Man and the Biosphere” (MAB)
Chief of Section “Ecological Sciences and Biodiversity”

Biosphere reserves are considered as sites of excellence where new and optimal practices to manage nature and human activities are tested and demonstrated. Such excellence needs to be validated following strict criteria, rewarded for its merits and publicized for the larger society. The agreement between Danone Waters Germany and UNESCO, in particular its MAB Programme that has created the biosphere reserve concept, is precisely addressing these

issues: based on a competitive bidding process, the most promising proposals are selected for their value in sustainably managing water resources in biosphere reserves of Germany. The financial support is a welcome contribution to further improve sustainable human-water-environment relationships. And the publicizing of successful practices can lead to replications not only in Germany, but in biosphere reserves the world over. UNESCO MAB commends Danone Waters Germany for its vision on this scheme. Given its tremendous success, we hope that similar arrangements can be implemented in other parts of the world – for the benefit of people and the environment.

Siegfried Demuth
**UNESCO, International Hydro-
logical Programme (IHP)**
**Chief of Section “Hydrological Pro-
cesses and Climate”**

Unprecedented population growth, a changing climate, rapid urbanization, expansion of infrastructure, migration, land conversion and pollution translate into changes in the fluxes, pathways and stores of water – from rapidly melting glaciers to the decline of groundwater due to overexploitation.



The project “Water education in primary schools”
(© Biosphärenreservat Spreewald)

The quality and quantity of freshwater from rivers, lakes, groundwater, soil moisture, and ice is under stress around the world. Water pollution is a serious global problem which impacts the health of freshwater systems and the people who rely on them for water. Many major rivers no longer consistently make it to the ocean; hundreds of meters of decline in fossil

groundwater sources are now endemic in some of the largest and most productive aquifers in the world; and pollution has dramatically impacted the aquatic habitat in many of the world’s prized water bodies. UNESCO’s IHP is very grateful to Danone Waters Germany for their continuous support for environmental projects that take care for people’s well-being.

Tom Albold
Danone Waters Germany
Chief Executive Officer

Sustainable commitment is in the heart of Danone’s philosophy and in our DNA for more than 40 years. For us at Danone Waters Germany, it is a real pleasure and a naturalness to continue this tradition with valuable partners, such as UNESCO and the MAB Programme. As a natural mineral water company with sources in big nature reserves, the provision and protection of water and nature resources has always been at the core of our actions. The clear link to water is the key for all our sustainability programs and we were more than pleased to accompany the launch of our new product with the support of innovative water projects in German biosphere reserves. We highly appreciate the way this partnership has evolved over the years and how all parties are working hand in hand to continuously create new ideas. It is a fruitful ongoing dialogue which also challenges us as a company to see things from different angles and to get new inspiration for our environmental objectives.



Agriculture accounts for 70 percent of global freshwater consumption, through irrigation. (Flickr CC John Curley)

Biosphere reserves and water

“Announce to them how water must be shared among them; each will have his own special time to drink.” (Qur’an, sura 54)

The general principle seems to be easy enough: Water is one and maybe the essential element of life for each and every one of us, and thus, each and every one of us has to protect it. For a long time, children around the world have learnt to be careful to turn off the tap; strict legal rules regulate water-intensive activities such as washing one’s car or watering the garden. However, in today’s globalized world, our impact on water resources is not always as simple and direct. Citizens of the

industrialized world, for example, have much more impact on global water resources through their food consumption than by turning on the tap. In most regions of Central Europe for example, water is not scarce and “virtual water” is imported hidden in food and cloth, frequently from water-scarce regions.

On a global average, 70 percent of freshwater is used in agriculture. For example, producing a kilogram of beef requires about 10,000 liters of water. Too much agricultural areas in water-scarce countries serve to produce feeding stuff for animals that end up on the European plate. This means we have to learn afresh what we should

do to protect water. In most places we need different and new approaches to freshwater – and climate change will require us to change our approaches over time.

Scarce water

From a global perspective, water is not scarce, neither for a population of 7 nor for 9 billion people. Yet, populations do not settle or propagate mainly according to water availability. Therefore, while water resources on our planet are estimated to account for some 1.5 billion cubic meters – in the seas, as ground water, in a frozen state or in the atmosphere - only some 3 percent of it is fresh water, which in turn is distributed very unevenly over the world (actually, most of it is stored in the ice of the polar regions). Thus, in practical terms, water is scarce and by the day will become an ever more precious commodity.

Apart from satisfying basic human needs, water also serves as the most important input factor for agriculture, as an energy source in reservoirs, as a route of transport and as an input factor for industry and virtually all power stations through cooling. People have always been settling along water sources. Nowadays, overpopulation and changed consumption habits impair the supply situation in many places, such as North Africa and the Middle East, Central Asia, parts of South Asia or the South-West of the USA. Further population growth and climate change will contribute to a change for the worse in the future. The most

important impacts of climate change on mankind and the environment are and will be through water. More and more people suffer from water-related extremes and disasters such as floods, tropical storms and droughts.

Water shortages are defined by an availability of less than 1000 cubic meters per person per year - countries as Kuwait already live on less than 100 cubic meters today. Where water is already scarce, people use virtually all water from the rivers for agriculture, domestic homes, tourism and industry. River ecosystems often get completely destroyed by removing water in massive amounts. In many places, fossil aquifers are tapped, i.e. groundwater resources that can be used only once. About 1.2 billion people do not have access to clean drinking water today, although water – and sanitation – has been acknowledged as a human right by a resolution of the UN Human Rights Council in 2010. By the year 2025, predictions say that water shortage will increase by 50 percent in developing countries and by 18 percent in developed countries, both because of population growth and of the consequences of human development: 1.8 billion people will live in areas of water scarcity.

Availability of water is becoming one of the key challenges for sustainable development. UNESCO's 3rd World Water Development Report of 2009 points out: "There is enough water for everyone. The problem we face today is mainly one of governance: equitably

sharing this water while ensuring the sustainability of natural ecosystems.” In large parts of Africa, for example, there is enough rain but insufficient institutions of bringing this water to the people. Because water does not respect human-drawn borders, it requires global coordination. This is where the United Nations and UNESCO come into play.

How UNESCO is responding

The United Nations Decade “Water for Life” (2005-2015) is the current framework promoting efforts to fulfil international commitments on water-related development goals of the Agenda 21, the Millennium Declaration, and the Johannesburg Plan of Implementation of the World Summit for Sustainable Development. One key goal is that decision-makers around the world implement the principle of Integrated Water Resources Management (IWRM) in practice.

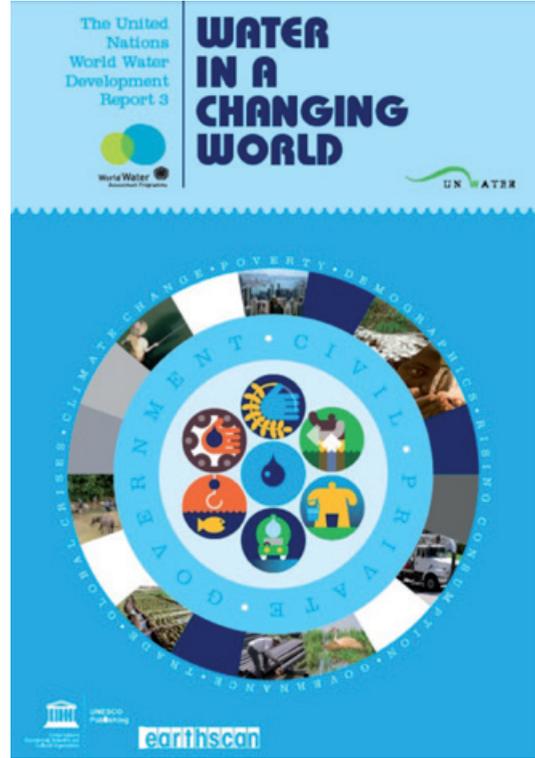
IWRM is a participatory approach of policy formulation, targeting water supply and water demand at the same time. IWRM aims to assemble all water users to take decisions together and to set up common goals. Today



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• International
• Hydrological
• Programme



it is a global standard, considering the entire water cycle and taking the ecosystems into account.

UNESCO and its intergovernmental scientific programmes contribute to the international water agenda through many different mechanisms, especially through research and trainings. UNESCO’s intergovernmental freshwater research programme IHP has improved our knowledge and our management capacities for more than 35 years now. UNESCO publishes the World Water Development Report every three years within the framework of UN-Water, an alliance of the more than 25 UN agencies active in

the field of freshwater. The triennial report provides solid evidence for developing effective approaches to water issues.

The UNESCO Institute for Water Education (IHE) in Delft in the Netherlands is the globally leading training institute in this field. More than 20 UNESCO institutes, several UNESCO chairs and more than 150 IHP national committees contribute to new knowledge and promote international cooperation. The German IHP national committee has made central contributions to UNESCO's efforts in the field of freshwater already for more than 35 years now. UNESCO has helped to promote many innovative research approaches, including ecohydrology, conflict prevention through water cooperation and IWRM.

At the same time, the UNESCO Programme "Man and the Biosphere" (MAB) with its World Network of Biosphere Reserves has great significance in the field of water. MAB aims to conserve ecosystems by providing opportunities to local communities for using natural resources sustainably. MAB's key instruments, the UNESCO

biosphere reserves, are model regions for sustainable development. In a wide variety of landscapes, they promote the development, test and deployment of new forms of land use, innovative energy concepts, preservation of cultural landscapes and of sustainable economic structures – all of these in coordination with the local population.

Model regions for water management

In many cases, the ecosystems within biosphere reserves are closely connected to the availability and quality of certain water sources; especially in these cases, the local population and the administrative structures in charge have long-standing experiences in water management. For example, it is obvious that biosphere reserves in marine or coastal areas and on islands have to deal with particular water issues – as those in deserts, drylands or in river landscapes.

Yet there are many other biosphere reserves whose very close relationship to water is identifiable only at second sight. Besides establishing the global *World Network of Biosphere Reserves*, the MAB Programme also aims to build and strengthen specific partnership networks between biosphere reserves in similar ecosystems and with similar challenges, in order to intensify exchange of information and cooperation. For example, the *Integrated Biodiversity Strategies for Islands and Coastal Areas* project established a network of island biosphere reserves around the Eastern Atlantic, called REDBIOS.



United Nations
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Man and
the Biosphere
Programme



In biosphere reserves situated in drylands, water plays a particularly important role. A woman in Mali (Flickr CC World Bank Photo Collection)

Another example is ASPAC, the *Asia-Pacific Cooperation for the Sustainable Use of Renewable Natural Resources in Biosphere Reserves and similar Managed Areas*, which also supports research on national strategies for biodiversity protection in coastal areas and brings forward technology transfer and trainings. For dryland biosphere reserves, the project *Sustainable Management of Marginal Drylands* (SUMAMAD) is of major importance. It assembles scientists from 10 countries to support combating desertification by sharing knowledge on sustainably managing arid areas, rehabilitating degraded areas, and educating youth.

Yet another example, the biosphere reserve *Oasis du Sud Marocain* in Morocco plays an important role in buffering the advance of the Sahara desert. The Hassan Dakhil dam controls the downstream water release, therefore the population needs to use groundwater in order to meet its water needs; however, ground water

management can greatly be improved by integrating hydrological and ecological approaches. The biosphere reserve's "water evaluation and planning model" makes groundwater use sustainable through spatial planning and land-use regulations.

The joint work plan between the UNESCO MAB Programme and the UN Convention on Wetlands (Ramsar) is another example of how biosphere reserves can contribute to improving water management. Some 100 of the 580 biosphere reserves include wetlands. The biosphere reserve *Pantanal* in Western Brazil, for example, was created only for the purpose of conserving the unique subtropical river floodplain and its biodiversity, endangered by the earlier creation of 26 large reservoirs and the Porto Primavera dam. Pantanal is one of the world's most extensive wetland complexes and internationally known for its abundance in species. Today, the biosphere reserve is clearly of benefit to local populations whose income is

based on fisheries and tourism. The partnership of MAB and Ramsar pools resources and streamlines national reporting.



A wetland in Japan (Flickr CC mtsn)

Another example of a partnership within the World Network of Biosphere Reserves, concerning similar water-related ecosystems, is that of the German *Elbe River Landscape*, the Russian *Great Volzhsko-Kamsky* biosphere reserve on the banks of the river Volga, and the *Lower Lobau* biosphere reserve along the Danube in Austria. The partners regularly discuss joint challenges and exchange good practice strategies.

There cannot be a one-size-fits-all solution for water management valid for all these diverse areas that obviously face different problems. In a dynamic world, there can also hardly be “ideal” solutions, stable over

decades. Different methods must be deployed and tested for each region, and their continued applicability must be constantly reviewed.

Such a dynamic approach including constant review, monitoring and testing is especially suited to be promoted by biosphere reserves. At the outset of each new management strategy, there is need to explore, define and explain sub-optimal water management procedures – often caused by previous human intervention in the natural ecosystems – by scientific research, ensued by educational measures targeting the population at large. Then, a participatory dialogue has to involve stakeholders into defining possible solutions. After that, appropriate measures can be developed and finally implemented in the model region, in full cooperation with the local community, policy makers and other stakeholders and taking into account all relevant interests.

This is carried out in an exemplary way in two very large-scale nature conservation projects implemented in German biosphere reserves. One is implemented in the *Elbe River Landscape*, more specifically on the “Lenzen floodplain meadow of the Elbe”. It addresses flood protection and nature conservation at the same time by relocating the dike near the village Lenzen over several years. Thus retention areas are re-created, allowing flooding dynamics to develop without interferences. Additionally, natural meadowlands



Elbe floodlands (Flickr CC Danny Sotzny)

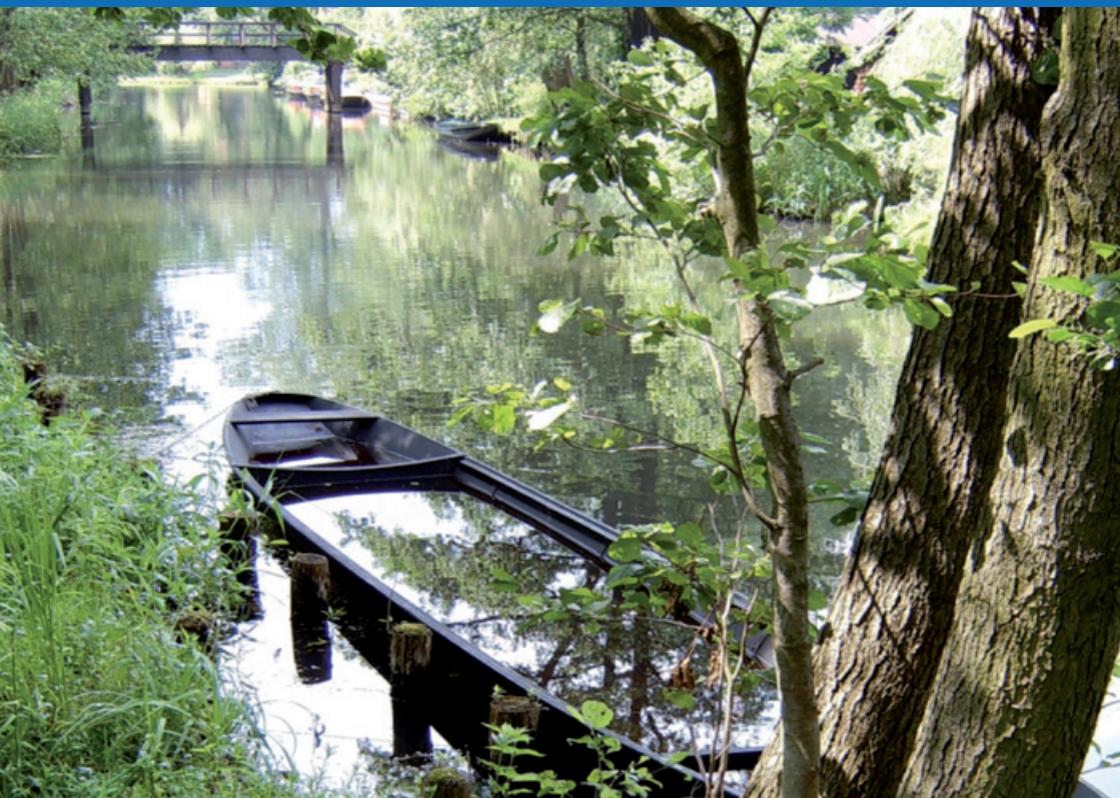
are restored. The opposite problem, water scarcity, is addressed in the “Water Edge Project” in the *Spree-wald* biosphere reserve. Until 2013 some 12 million Euros will be spent on manifold measures to optimize the water balance of the area which has been largely influenced by measures of hydrological flood protection in the 1930’s, by pumping down ground water in the course of brown coal production in Lusatia in the 1960’s, and finally by creating a new lake district nearby. In the framework of the project, obsolete water management constructions have been removed, lakes reconnected and fen areas revitalised to maintain biodiversity and improve the capacity of the landscape to store water. Both projects are special in that the close contact to local stakeholders and municipalities is a high priority.

This brief overview is to underline the potential of biosphere reserves as model regions in the field of modern water management, and their significance as nodes in a network of mutual exchange. Through combining nature conservation with sustainable use and addressing ecosystem services in innovative ways, the results of scientific research can be optimally tested in pilot projects with advantages to all parties. In a further step, the projects can be adopted in other areas, within the World Network of Biosphere Reserves or beyond.

In the years to come, biosphere reserves can contribute even more to the two main global challenges for water availability and water quality: climate change and demographic trends. Practices for mitigation or adaptation to climate change have main impacts on water resources, and vice versa methods of water management can largely affect the climate. Biosphere reserves already offer various insights on water-related issues such as flood control, storm protection, water purification and access which will be further developed all over the world.

In this endeavour, biosphere reserves will have to cooperate much more than today also with new partners, including the private sector. The partnership between Danone Waters Germany and the German biosphere reserves offers important positive lessons.

Right: Spreewald biosphere reserve (Flickr CC Michael Bertulat (photo at the top), Flickr CC mab6266)



Volvic

mit einem
Spritzer Saft.



The partnership

Danone is a multinational company with leading brands in dairy products, mineral water, baby and medical nutrition. Danone offers several mineral water brands, of which “Evian” and “Volvic” are known best. Taken together, Danone Waters has a market share of 8.5 percent of the global market for mineral water.

For several years now, the mineral water market in industrialized countries such as Germany has diversified. Mineral water brands also offer sub-brands that combine water with dashes of tea, juice or syrup in response to changed consumption patterns. Danone Waters Germany launched “Volvic Landfrucht” in 2008, a mineral water with a dash of fruit juice.

Danone has made excellent experiences in recent years in cooperating with international organizations such as UNICEF, the Grameen Foundation, Ramsar and IUCN as part of their refocused sustainability approach. Thus, a partnership with German UNESCO biosphere reserves was a straightforward choice, accompanying the launch of the new sub-brand. From the perspective of Danone Waters, partnering with German biosphere reserves should allow explaining to the German consumer the corporate approach to protect the mineral water’s source in the French volcanic region of Volvic. UNESCO biosphere reserves combine sustainable use and conservation, therefore they are a much more obvious partner than classical nature protection areas.

In concrete terms, this “explanation” was achieved in a twofold way. The labels of the bottles “Volvic Landfrucht” explained the approach of UNESCO biosphere reserves, thereby underlining as well the approach of Danone Waters near the Volvic source in France. At the same time, Danone Waters provided financial support to selected projects in selected German biosphere reserves. These projects made the approach and specific characteristics of the biosphere reserves – and of Danone Waters – even more comprehensible and they were closer to the consumer also in geographic terms. Thus, consumers could learn about many different ways that water quality today is and must be protected, beyond the knowledge that the consumers will already have from their school education. And this new knowledge could immediately be translated back to an area close to home. Danone Waters entered this partnership after surveying the consumers’ opinion on UNESCO and biosphere reserves.

Ahead of the cooperation agreement established in April 2008 until the end of 2010, the German biosphere reserves and the German MAB national committee had been closely involved to seek their consent to the proposed cooperation. A factor that contributed particularly much to the unanimous agreement of these partners was that Danone Waters contractually agreed to make particular efforts to advance corporate sustainability during the three years for which the partner-

ship was established. And in fact, by 2010, all Volvic mineral water was transported from France to Germany by rail instead of by trucks. Also from the point of view of the German Commission for UNESCO this factor underlined the clear commitment required from its private partners. Such commitment can be shown through participation in the UN Global Compact and by a track record in concrete corporate sustainability measures.



UNESCO Headquarters was a partner from the outset, especially because of the directives adopted by the UNESCO General Conference in 2007, governing the use of UNESCO’s name, acronym and logo. The bottle labels under consideration indeed had the UNESCO MAB logo on them which is only possible if a contract is established directly with UNESCO. Thus, the partnership agreement signed in 2008 between Danone Waters Germany GmbH, UNESCO

and the German Commission for UNESCO brought together three partners with varying perspectives but with joint objectives: to promote biosphere reserves and to support the most innovative approaches to water management within them. The overall objective was to safeguard and improve the quality of water and water bodies for future generations.

How projects were selected

In three subsequent competitive calls for proposals (2008, 2009 and 2010), the 15 German UNESCO biosphere reserves were invited to submit project proposals. Each year, up to 10 proposals have been submitted. An independent jury selected the best 3 or 4 project proposals. The jury was composed of one representative from the MAB Secretariat of UNESCO, one representative of the Secretariat of UNESCO's freshwater programme IHP and two members of the German MAB national committee; its chairperson and the chairperson of the permanent working group of German biosphere reserves (a ministry official). The calls for proposals were based on a straightforward, short application form. The jury assessed the project proposals according to ten weighted criteria which were known to applicants.

Ten projects in six German UNESCO biosphere reserves have been supported through the partnership so far. The overall financial contribution of Danone Waters Germany exceeds 300,000 Euro.

From the first call for proposals in 2008, four projects were successful:

- In the *Wadden Sea of Lower Saxony* integrated aquaculture has been tested.
- In the *Elbe River Landscape* in Brandenburg the water balance of a forest has been improved.
- In *Upper Lusatia*, a bog has been rehabilitated.
- In the *Elbe River Landscape* in Lower Saxony a low-impact method of removing invasive plant species has been tested.

In the second call for proposals in 2009, three projects were successful:

- In *Schorfheide-Chorin*, integrated, sustainable pond aquaculture has been established.
- In the *Spreewald* the herbal garden adjacent to the biosphere reserve information center has been equipped with a cistern.
- To the *Elbe River Landscape* in Brandenburg additional funds have been granted in a follow-up project for restoring a forest.

In the third call for proposals in 2010, three projects were successful:

- In *Schorfheide-Chorin*, a solar research and training vessel on a major lake receives equipment for experiments and analysis.
- In the *Elbe River Landscape* in Lower Saxony, horses support ecologically sustainable forestry for groundwater protection.
- In the *Spreewald*, Education for Sustainable Development on water is implemented.

Additional elements of the partnership

After three years of cooperation, information on biosphere reserves has been spread to consumers on more than 10 million labels of the product “Volvic Landfrucht”. Thus the public awareness for this important UNESCO programme has considerably increased. During 2008, the labels focused on presenting general aspects of the biosphere reserves. From 2009 onwards, there was more and more focus on individual, tangible projects. Communicating together with and through private partners is an indispensable means of communication for publicly funded institutions such as the biosphere reserves. Scarce public funds do not allow massive communications with consumers.



The pavilion of the German UNESCO biosphere reserves (CC DUK/L. Möller)

Danone Waters Germany also supported the permanent pavilion of the German UNESCO biosphere reserves at the *Federal Gardening Exhibition* in Schwerin in 2009. This pavilion was the key event of the official “German Year of Biosphere Reserves”

under the patronage of Chancellor Angela Merkel and the then Federal Minister for the Environment Sigmar Gabriel. The pavilion of some 600 square meters was located centrally in the exhibition and was operated for more than five months. It presented the World Network and focussed on topics such as climate change and sustainable consumption. The pavilion attracted more than 1 million visitors. Danone Waters funded additional promotional material, especially printing some 100,000 copies of a “Biosphere journal” distributed for free to visitors.

Danone Waters Germany also organized holiday trips and youth camps in German biosphere reserves. In 2008, family trips to the Schaalsee biosphere reserve with a week-long excursion and activity programme on water were the prizes of a raffle on websites addressing young families. In 2009, students could apply for taking part in a youth camp organized in the biosphere reserve Wadden Sea of Lower Saxony. Another valuable contribution of Danone Waters was making available a quantitative consumer survey on the public profile of UNESCO biosphere reserves.

By early 2011, the partnership has formally expired. Because of an ongoing reform of the sustainability approach of Danone, it has so far not been renewed. However, several of the ten projects have only started in early 2011; therefore the impact of the cooperation is still unfolding.



The Wadden Sea: a sensitive ecosystem (Flickr CC Gerrit Gragert)

Project summary

Water purification and integrated aquaculture (2008)

UNESCO biosphere reserve *Wadden Sea of Lower Saxony*

The UNESCO biosphere reserve

The “Wadden Sea of Lower Saxony“ is one of three German biosphere reserves covering the German Wadden Sea (each biosphere reserve is located in a different federal state). The Wadden Sea is a very large coastal wetland formed by deposited sand and mud within the intertidal zone all along the German North Sea coast. It has formed in the sheltered area behind a series of protective islands. While only few very specialized

species have their habitat in the Wadden Sea, the biomass is enormous: It is an important nursing ground for fish and an essential stepping stone, resting and feeding area for many millions of birds every year. There are also some ten thousand seals living in the Wadden Sea and the surrounding waters.

There are hardly any people living in the biosphere reserve in its boundaries as of today; however,

many villages and some towns are directly adjacent. For five years already, following a clear demand from UNESCO and the German MAB national committee, the biosphere reserve administration has been negotiating with communities and districts adjacent to the Wadden Sea to include them into the (so far very limited) transition area. The local economy of the coastal region strongly depends on tourism, agriculture and fisheries. A considerable part of the agricultural land today is used on a near-organic basis. In the area, there are also many

visitor centers that inform tourists and locals about the sensitive ecosystem of the UNESCO biosphere reserve and World Heritage site Wadden Sea.

The role of water in the biosphere reserve

The largest part of the biosphere reserve actually consists of the specialized ecosystem Wadden Sea, i.e. tidal flats and gullies, salt marshes, dunes and beaches along the Lower Saxon coast and most parts of the East Friesian Islands. The tidal dynamics create extreme living conditions and diverse habitats, changing two times a day with the tide. Three rivers (Ems, Weser and Elbe) discharge into the area and form estuaries. Water and its dynamics therefore clearly are most relevant for shaping the landscape and the biosphere reserve at large.

The project: Objective

The aim of the EU Water Framework Directive is to achieve a “good status“ of all European inland and coastal waters until 2015. For example, the nutrient load in river basins shall be reduced significantly. Also in coastal waters, additional measures to reduce nutrients need to be implemented. One possibility to remove dissolved and particulate nutrients from sea water is the use of organisms in integrated forms of aquaculture. Different macrophytes (algae) and invertebrates (filtered mussel species) may act as a sink for nutrients. Algae are able to remove up to 80 percent of the nutrients from the surrounding water and convert it into valuable biomass.



Habitat for birds and seals (Flickr CC Dolphin)

Algae in the North and Baltic Sea have the added benefit that they grow three to four times faster than comparable land plants.

The project sought to remove the nutrients from coastal water bodies in an experimental pilot project fashion through purely ecological means and thereby to approach one of the root causes (nitrification) of low water quality, in a sustainable way. The project tested a method, previously only tried out in the lab, for the first time under real-life conditions



The 4 tank ponton (© W. Schuster)

The project: Implementation

The project's principle in water treatment is cultivating marine macro algae in semi closed tank systems. The focus is on native algae of the North Sea and the Baltic that may assimilate plenty of nitrogen in form

of nitrate or ammonium as well as phosphate in little time.

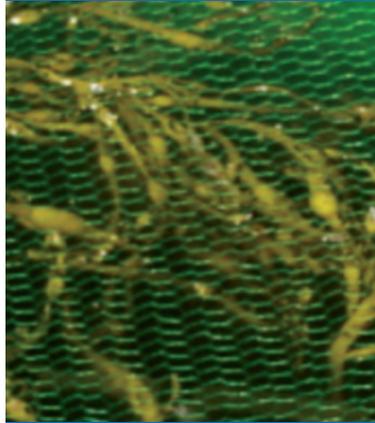
The efficiency of the process is further improved by adding tanks containing blue mussels. They literally clear the water and thereby the algae obtain better growth conditions since they require light for photosynthesis. With the turbidity removed by the mussels, light penetrates deeper into the water column. Moreover, mussels are able to assimilate nutrients bound to particles and release them in a form that the algae may use. It was known from earlier research that such an integrated aquaculture can absorb sea water nutrients very effectively. The research intended to demonstrate that such a set-up can actually enhance the self-purification capacity of the Wadden Sea, under real-life conditions.

A ponton of a size of 4 by 6 meters with four tanks of 300 liters containing the culture tanks has been deployed in the Hooksmeer, a medium-size water body in the Jade Bay close to the lock at the village Hooksiel. It has been moored on land to poles and seaward to an anchor stone. Two tanks for the culture of algae were placed next to two mussel culture tanks. Two of them were interconnected respectively. Water from a depth of 1 meter in the Hooksmeer was first pumped into the tank containing mussels. Loaded with less suspended matter, the water flows on to the subsequent tank with the algae that remove the dissolved nutrients.

The experiment was conducted with brown algae and with red algae in parallel. Two times a day the pumps change the water in the tanks: Less charged with suspended load, the water from the mussel tanks is pumped over into the algae tanks. The algae absorb the dissolved nutrients, such that in the end the waste water has a reduced environmental impact. As stated before, the objective of the small-scale pilot project was to demonstrate the principle and the fundamental feasibility under real-life conditions.

The entire project was meticulously monitored and additional research carried out with a view to further improve the set-up. The experiment concluded that on average, 80 percent of nitrates and 89 percent of phosphates had been withdrawn. The algae may thereby really contribute to a better water quality – and at the same time they may be used for example as valuable biomass for energy production. In summary, there is a clear win-win-situation. In addition, the whole mechanism needs little maintenance. The pumps use solar power as energy resource.

The Danone Waters cooperation provided financial means of 25,000 Euro. Taken overall, the project proved to be successful. Several local and specialized media covered the project.



Algae and mussels assimilate sea water nutrients
(© MaRenate)

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The forest Gadower Forst with the improved channels in the *Elbe River Landscape* (© Jochen Purps)

Project summary

Improving water supply to a forest (2008 and 2009)

UNESCO biosphere reserve *Elbe River Landscape in Brandenburg*

The UNESCO biosphere reserve

The biosphere reserve extends along the Elbe River across five German Länder (federal states), i.e. Sachsen-Anhalt, Brandenburg, Mecklenburg-Vorpommern, Lower Saxony and Schleswig-Holstein. In each of these five federal states, a separate management authority or administration has been set up. The Brandenburg part of the biosphere reserve is of the size of 530 square kilometers and extends more than 70 kilometers along the

Elbe, from the city of Havelberg in Sachsen-Anhalt in the East to Dömitz in Mecklenburg-Vorpommern in the West, with an extension of some 10 to 20 kilometers perpendicular to the river. About 160,000 people are living in the entire biosphere reserve, some 31,000 in the Brandenburg part.

The biosphere reserve boasts some of the largest contiguous floodplain forests in Central Europe. Other habitats are flooded grasslands, sand

dunes, sandy dry and oligotrophic grassland, coniferous and mixed forests and lowland marshlands. The biosphere reserve administration takes care of a number of projects, among them one of the largest “dike relocation” projects in all of Europe, close to the village of Lenzen. Following some devastating floods, especially the notorious flood in 2002, the need to give more space to the river has been widely acknowledged. Within the recently accomplished Lenzen project, the dike was relocated 1.2 kilometers backwards away from the river, adding new floodplains of 4.2 square



The new dam (© Jochen Purps)

kilometers. Other projects of the administration focus on the restoration of backwater lakes, management of beaver populations and willow vegetation, floodplain forest development, Education for Sustainable Development and the promotion of tourism in the Elbe River region.

The role of water

The Elbe River Landscape is a near-natural river landscape with large flood plains, sandy shores, inland dunes and brackish water. The new colonies of the Elbe beaver are just as famous as the otter colonies and the considerable number of storks in summer. Actually, the village of Rühstädt in Brandenburg is a nationally known “stork village” with the largest population of these birds in Germany. All these emblematic animals depend on habitats dominated by water.

Since along the river the ground is very sandy, small hydraulic changes have impacts over many square kilometres. The preservation of flood plains and care for the remaining alluvial forests are among the most important projects in the Elbe River Landscape.

The project: Objectives

The project addressed a forest called “Gadower Forst” in the vicinity of Wittenberge and next to the Elbe – a mixture of fen forests of oak, hornbeam, and alder, exactly halfway between the cities of Berlin and Hamburg. The main objective of the project was to restore the water storage capacity of the moist forest ecosystems that serve as buffers for extreme climate events. A second objective was to improve the water quality of the nearby waters, the rivers Löcknitz and Elbe. Actually, two phases of the project have been financed by Danone Waters, in 2008 and in 2009, based on success in two calls for proposal.

The project area is situated on an extensive sand terrace of the Elbe valley. In the direct vicinity, there are some 2 square kilometers of state-owned forest, destined to be a core area of the biosphere reserve. Even closer, there is a complex of some 7 square kilometers of deciduous forest in private ownership. This is part of the transition area of the biosphere reserve and hence an area that should combine sustainable use and nature-conserving forest management. If the water dynamics in this area were natural, they would very much be directly linked to the water level of the nearby Elbe, because of exchange of water in the underground. Yet the water dynamics has been fundamentally altered by hydraulic installations – unfortunately in very inadequate ways, from the point of view of forestry.

The reason for the inadequate hydraulic measures of the past is the existence of large agricultural areas adjacent to the forests. The water management system has been optimized in the past with the single objective to meet the needs of agriculture – thus the system heavily impacted on the water balance of the forests. Year by year, this has led to ecological damages such as trees dying from water shortage. More concretely, in 2006, several dams had been installed and the corresponding channels only flooded in spring, to support agriculture, but kept dry in winter seasons. The unsatisfactory water management limited the water storage capacity of the forests, which in turn affected water quality and also increased the frequency of water shortages or floods.

The project: Implementation

In the first phase of the project (autumn 2008 until summer 2009), a thorough study of the situation and of potential solutions has been conducted. The study resulted in informative data which became the basis for subsequent discussions among all stakeholders and straight-forward decision-making. The study also proposed a number of practical measures to improve the water supply of the “Elsbruch” forest. The results of the study have been discussed in a working group consisting of several stakeholders of local authorities, forest owners, etc. meeting several times. As immediate priority, the need to install a small dam was identified.



The project underway at the “Elsbruch” (© J. Purps)

This dam in fact decouples the water management systems of the forests and the agricultural areas. The study, the meetings of the working group and the construction of the dam have been financed by Danone Waters with 20,000 Euro in the first phase of the project.

Several other measures identified by the study were financed from state funds of the Land Brandenburg. Some additional measures, however, were not eligible to be financed by government sources because of specific water legislation and water rights. These additional measures have been implemented in the second phase of the project between September 2009 and April 2010. Another 7,000 Euro have been granted from the cooperation of Danone Waters and UNESCO. These measures mainly consisted in positioning simple pipes with a large diameter and a flexible end section in three pre-existing dams. Thus, in autumn and winter, water can now flow into the forest, while, by simply turning around the flexible end sections, in spring and summer, water can be prevented from flowing out of the forest.

The quick, visible success in the first project phase persuaded partners as well as the public. In the media, the project was highly appreciated and the role model character was praised. To further inform the public about the project, lectures, field trips and excursions are organised by the biosphere reserve's visitor information center

“Burg Lenzen” together with nature rangers and the local chief forester. The project has been visited by important delegations from Germany and from abroad and it has even been submitted as a candidate to a European award.



The dam is inaugurated using Volvic water, together with a local landlord (© Archiv: Biosphärenreservat Flusslandschaft Elbe-Brandenburg)

The valuable moist forest and with it the core areas today can better exercise their water storage and filtering functions. This significantly contributes to ecosystem functions and conserving biodiversity in the complex. The involvement of many partners in the work has also led to an improved cooperation among stakeholders in the UNESCO biosphere reserve.

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Ponds at Guttiau village in the biosphere reserve (© Matthias Höhne)

Project summary

Revitalising a bog (2008)

UNESCO biosphere reserve *Heath and Pond Landscape of Upper Lusatia*

The UNESCO biosphere reserve

Part of this biosphere reserve is one of Germany's largest pond regions, about 80 kilometers to the north-east of Dresden. The "Heath and Pond Landscape of Upper Lusatia" is a rather small biosphere reserve extending from Hoyerswerda in the North to Bautzen in the South and Niesky in the East. It features very diverse habitats and a rich species diversity in a small area. For instance, ponds are located right next to sandy dunes.

Some 9,500 people live in the area, in 60 villages. The Sorbs, Slavic settlers who immigrated to this region in the 6th century, have maintained their traditional customs and language until today. The key objective of this biosphere reserve is to maintain its unique man-made landscape by using it sustainably through agriculture, forestry, fishery, tourism, and industry. Involving the population is taken very seriously. Ambitious research and education programmes are in place.

The role of water

The ponds represent about 9 percent of the total area of the biosphere reserve. They are man-made, laid out several centuries ago. Due to their age, due to their structure and due to extensive farming, they are particularly valuable, both ecologically and culturally. The water dynamics of the ponds directly influences a large area: in the surroundings of the ponds, the water levels vary substantially over the year, following the rhythm of the ponds being annually drained for harvesting carp. Scientists largely agree that impacts of climate change are already visible. Over the last years, precipitation rates in the biosphere reserve fell distressingly.

Fishery plays a big role in the region's economy. It is mainly carps that

for centuries have been raised in the ponds. A key project of the biosphere reserve during the most recent years has been to increase the economic value added in the region through transforming the pond fishery from conventional carp aquaculture to organic carp aquaculture. The organic carp is merchandised using the brand of the biosphere reserve since 2008 with great success, all across Germany.

The project: Objective

Southerly adjacent to one of the largest ponds, there is a "transition moor" of some 12,000 square meters. A "transition moor" carries its name because it is a bog whose ecology and vegetation is actually a mixture of a bog and a fen. The transition moor is in the buffer zone of the biosphere reserve and houses the largest occurrence of



A pond in the *Upper Lusatian Heath and Pond Landscape* (© Ralf M. Schreyer)

bog heather in the area and about 100 species listed on the national Red List. The transition moor had been affected by municipal waste water until the year 2000 and by the fall of the water level every time the adjacent pond had been drained.

In terms of ecological function, the transition moor primarily serves as water reservoir that conserves winter



A silted bog (© Ralf M. Schreyer)

precipitation surplus and compensates summer rainfall deficits. Furthermore, substantial quantities of nutrients and greenhouse gases are absorbed. But the impacts from villages and from fisheries on the transition moor had been so severe that it could hardly fulfil its regulating function appropriately.

The project had a simple, straightforward objective: Restore the ecological resilience of the transition moor. Without the project, the tran-

sition moor would have degenerated further; also more carbon dioxide would have been released.

The project: Implementation

The means to implement the project have been as straight-forward as the project objective: They mainly consisted in installing a wooden stand (height approximately 2.0 meter) that can regulate the water table in the transition moor, independently of the water table of the nearby ponds. The run-off of the municipal waste water had been taken care of recently through separate measures. Thus, the transition moor and its water table were stabilized in terms of quantity and quality. Today the water level is sufficiently elevated all around the year preventing reed to grow and pine to settle in the transition moor.

All tasks, mainly consisting of building and installing the wooden stand, were accomplished by staff of the foundation supporting the biosphere reserve. The project also was helpful in supporting environmental education by including young people in the implementation. Some 7,500 Euros have been granted to the project.

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The wooden stand is installed and working (© Ralf M. Schreyer)



The river Elbe in Lower Saxony (© Biosphärenreservat Flusslandschaft Elbe)

Project summary

Water quality and invasive species (2008)

UNESCO biosphere reserve *Elbe River Landscape in Lower Saxony*

The UNESCO biosphere reserve

With a surface of approximately 3,500 square kilometres, the biosphere reserve is by far the largest (terrestrial) in Germany. “World Culture along wild shores” is its tourism marketing claim. The Lower Saxon part of the biosphere reserve accounts for roughly 15 percent of the area - that is 567 square kilometers along 95 kilometers of the river between the cities of Schnackenburg and Lauenburg.

The Lower-Saxon part of the biosphere reserve has a special diversity and a high density of rare and endangered habitats, animal and plant species. About 250 bird and 1,300 plant species have been detected. The beaver that had been extinct since 1819 has resettled along the Lower Saxon Elbe in the 1990s; today, there are now more than 500 beavers. The Elbe in Lower Saxony has become a new home for the otter as well. The biosphere reserve administration

has implemented several innovative projects recently, among them an initiative to generate more income for the region through low-impact tourism and a project to reconcile the needs of nature conservation with the impacts following from the increasing economic attractiveness of growing biofuels on agricultural land.

The role of water

The Elbe, with a length of 1094 kilometers from its source in the Bohemian Mountains to its mouth in the North Sea near Cuxhaven is the fourth largest river basin in Europe. In the Lower Saxon part of the Bio-



The Elbe is home to rare species such as the beaver. (Flickr CC twicepix)

sphere Reserve, the tributaries Aland, Seeger, Jeetzel, Löcknitz and Sude discharge into the Elbe. Thus, everything revolves around “water” here. The biosphere reserve intends to preserve the beauty of the landscape for inhabitants and tourists and to protect the livelihood of many animals and plants in and along the river.

The project: Objectives

The Hühbeck near the municipality of Gartow is a hill, 77 meter high, next to the Elbe, standing visibly out from the landscape. An only one kilometer long creek called Thalmühlbach has its source near the top. Because of its steep slope, the creek’s features are quite special for this part of Germany.

Along the creek, especially near its mouth, a quite large patch of the invasive species *Reynoutria japonica* or “Japanese knotweed“ had developed. An invasive species, also called neophyte, is a plant species only recently introduced to an area – in contrast to an archaeophyte, a well-established species. The Japanese knotweed is able to rapidly spread in Germany under current Western European climatic conditions. It actually supplants much well-established and typical, diverse vegetation – in other places and here, on the banks of the Thalmühlbach. The neophyte changed the morphological bank structures, increasing erosion, and reducing the self-cleaning capacity of the water flow.

It was feared that the knotweed could quickly spread as well to other areas along the Elbe from this first place of discovery. In typical approaches, removing the plant would effectively be done using chemical herbicides. However, using herbicides is particularly inappropriate adjacent to rivers and creeks. The project funded by Danone Waters intended to test a different approach with less negative side effects on the environment.

The project: Implementation

The project consisted in removing the knotweed mechanically and then deploying a black, opaque film for up to three years on the area. By disabling photosynthesis it was expected that the knotweed is prevented from growing, and will hopefully die off. The absolute obscuration of the subsurface is the only known alternative to herbicides to eliminate the knotweed in the long run. Since the plant roots spread up to one meter depth in the subsoil, other measures such as digging and ploughing are not sufficient.

At the same time, species of native trees such as elm, ash, etc. were planted in the area. They provide enough shade after the removal of the film. Afterwards, the area was planted with additional native shrubs. The project was funded with 14,500 Euro. In the long run, the experiences from this project could provide important insights into effective and environment-friendly management of neophyte species in floodplains. That is why the project can be a model for similar projects in other regions.

The project was accompanied by students from the University of Hamburg. A partner of the biosphere reserve, the information and event venue “Elbauenstation Pevsdorf”, run by the University of Hamburg, regularly organizes field trips for students and interested

groups, of which the knotweed project is now a standard part.

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On top: The Japanese knotweed, an invasive species (Flickr CC dankogreen); below: A black film prevents the plants from regrowing (© Hartmut Christier)



Ponds are the habitat of many animal and plant species (Flickr CC Thomas Kohler)

Project summary

Sustainable pond fisheries (2009)

UNESCO biosphere reserve *Schorfheide-Chorin*

The UNESCO biosphere reserve

The biosphere reserve in the northeast of Berlin has received its UNESCO designation in 1990. It extends over an area of 1,292 square kilometers. Its landscape is founded on ice age moraines and outwash plains; the area is naturally covered by forests, wealds, fens and lakes – habitats for numerous species of animals and plants. The Schorfheide has been a hunting resort for several centuries; the municipality of Chorin

is widely famous for its medieval brick Gothic abbey. The area is sparsely populated. Major sources of income of the inhabitants are tourism, agriculture and fishery.

A focus of activities of the biosphere reserve is improving the marketing of regional products and services for both locals and tourists. A dedicated logo certifies healthy and sustainably produced products and services. At the same time, organic farming preserves

old and rare agricultural crops, potatoes, vegetables and fruits. In the biosphere reserve, organic farming accounts for a 32 percent share of today's agricultural area. For comparison: In all of Germany, this share is 6 percent.



The river Welse becomes too trophic due to the feeding of fish in adjacent ponds. (Flickr CC Steffen Sameiske)

The role of water: Pond fishery

Schorfheide-Chorin is one of the most arid parts of Germany, being situated in the transition of maritime and sub-continental climates. The biosphere reserve prides itself of a frequently visited central information center called Blumberger Mühle which is located in the middle of a pond landscape which in turn is part of a nature conservation area. The ponds are an important habitat for many bird species. Half of the ponds in the biosphere reserve are also used for fishing, according to organic production principles. At the same time, fee-

ding the fish with corn, even organic corn, results in a significant nutrient load in the ponds. The nutrient-rich water that is drained once every year from the ponds to catch the fish enters the adjacent river Welse and impacts the quality of its ecosystem significantly. This 58 kilometers long river thus regularly becomes too trophic and contains too much sludge.

The project: Objectives

The project funded by Danone Waters in 2009 in the biosphere reserve Schorfheide-Chorin has been about improving the fishery system of the pond situated right next to the Blumberger Mühle. The project was one crucial contribution to the first fully sustainable pond fishing solution in Germany and presents a prototype for economically breeding fish and at the same time reducing the impact to adjacent river ecosystems. The State government of Brandenburg had set aside funds to finance all mechanical parts, all machinery and all building work for the project, but could not account for the scientific support and for public awareness measures. However, it is only through documentation of the results and through public outreach, that a stand-alone project like this can be turned into a prototype that can reach out to an entire region and beyond.

The project: Implementation

Through state-funded installations, the water in the pond today is filtered once the pond is emptied with the aim of keeping the nutrients within.

Filtering and pumping the water requires energy that is provided by a turbine situated where fresh water is entering the pond. Thus the installation does not require outside energy, creating a closed cycle both in terms of nutrients and energy.

The add-on project funded by Danone Waters added scientific evaluation and supervision to this stand-alone project. Thus, learnings and best practice may be derived from the planning and the implementation in order for such an in-stallation to become the prototype for similar sustainable pond aquacultures in Germany and, therefore, have a high multiplicative effect. Informative meetings in other German pond landscapes have been held with a view to raise awareness for this new solution.

The results of the project are also used for activities in Education for Sustainable Development implemen-

ted by the biosphere reserve. In the information center, a learning module “Water and me” has been created. Around nearby ponds, information panels explaining the project have been set up. There are about 35,000 visitors annually to the information center, who usually also visit the pond landscape and will thus be informed about the project.

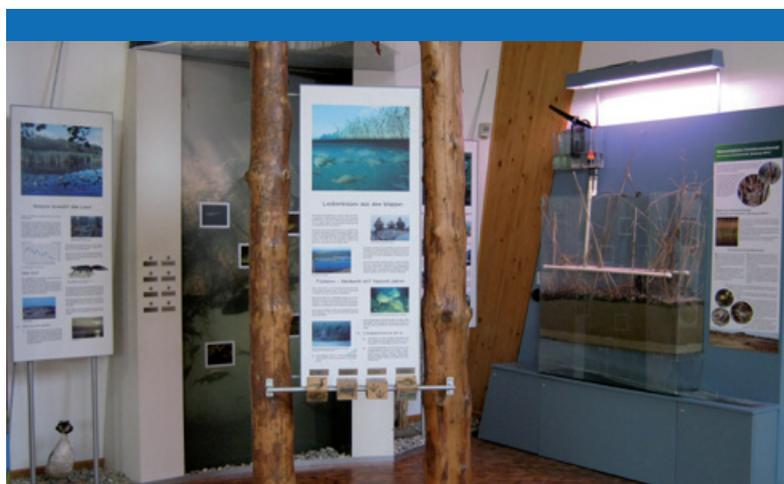
22,000 Euro have been provided to the academic study and evaluation. The first stage consisted in assessing the original state of nutrient-stress in the ponds. A scientific symposium and extensive public relations have been funded as well, to ensure the best possible outreach.

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In the Blumberger Mühle information center, visitors can learn about the project. (© NABU BIZ Blumberger Mühle)



The river Spree (Flickr CC Stefan Fussen)

Project summary

Harvesting rain water (2009)

UNESCO biosphere reserve *Spreewald*

The UNESCO biosphere reserve

The biosphere reserve Spreewald is situated 100 kilometers south-east of Berlin in the region of Lower Lusatia. The landscape of the area, of a size of 475 square kilometers, was shaped during the ice age. It is known for its traditional irrigation system of small rivers and channels, in its entirety some 1,500 kilometers long. These watercourses and thus water as an element dominate an extensive

area. A patchwork of alder forests and meadows on wetlands are characteristic for the region, however, also fields and pine forests on sandy dry areas can be found here.

The traditions and lifestyles of the population are closely connected to the water meadow landscape. About 50,000 people live in the biosphere reserve. Some of them are descendants of the first settlers in the Spreewald region, the Slavic tribes of the Sorbs.

Until today, they have preserved their traditional language, customs and clothing. The inhabitants' income very much depends on tourism. Tourists enjoy exploring the Spreewald channels in punts or canoes. Other important sources of income for the locals are agriculture, forestry and fishery.

The role of water

In terms of precipitation, the Spreewald is one of the most arid areas of Germany (only 530 millimeters of annual precipitation). Climate change will further reduce rainfall and thus endanger the water supply of the entire region. Until today, most inha-



Falling water tables in Spreewald lakes can have different reasons. (Flickr CC Torben)

bitants have covered their water needs from the river Spree, the channels, or the nearby lakes in summer, when precipitation is usually very low – which will not be possible anymore in the future because frequent low tides are expected. One of the largest German nature conservation projects is imple-

mented in the Spreewald biosphere reserve, the “Spreewald Water Edge Project”, which shall optimize the water balance of the area by manifold measures on which local stakeholders and municipalities have agreed beforehand. Nevertheless, the residents must urgently reduce their water use and find new ways of saving water.

The project: Objectives

The project supported by Danone Waters in 2009 constructed a cistern system for a herbal garden in the “Schlossberghof Burg”. This is one of the information centers of the biosphere reserve, situated nearby a historical palace and surrounded by a lush garden of some 4,000 square meters. The garden contains more than 600 medicinal plants and spices. It preserves wild and historic crops for generations to come. It serves as one of the main assets of Education for Sustainable Development of the biosphere reserve and each year welcomes some 10,000 visitors.

The project at one of the central sites of the biosphere reserve intends to demonstrate to each visitor that every individual person may and must contribute to avoiding water shortages. The irrigation system demonstrates to all visitors who might have a garden at home, how a cistern in practice can work to retain rainwater. The main objective therefore is communication. At the same time the project tangibly improves water quality in the Spree channels because the garden itself was a considerable consumer of water.

With less water withdrawn for the needs of human beings and gardens, more water is flowing in the Spree channels instead of standing; thus, more water is available for the needs of ecosystems. Moreover, potential surplus from the cistern will be channelled into the natural water system. All this in turn leads to more oxygen inside the water system which improves living conditions and supports species diversity.

The project: Implementation

While cisterns are commonplace installations in many parts of the world, they are not frequently found in Germany. Thus the principle must be re-explained to the general public: Rainwater is captured in the cistern on the roof of the information centre and stored in a waterproof receptacle. It is then used for irrigation of the herbal garden, through an elaborate network of pipes and valves. 20,600 Euro of funding was spent for the cistern in the herbal garden and for accompanying measures.

Even more important than constructing the cistern was closely cooperating with all local stakeholders to maximise the multiplicative effect and reaching out to the population. To achieve publicity, the biosphere reserve tour guides explain the cistern project in detail during their tours of the herbal garden. On World Water Day 2010, the 22nd of March, the biosphere

reserve administration in cooperation with the regional water distribution company organised an event “Efficient use of water”. This event was visited by some 100 stakeholders.

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Installing the cisterns (© Biosphärenreservat Spreewald)



Lake Werbellin, a popular tourist destination (Flickr CC smee)

Project summary

Solar-driven research vessel on Lake Werbellin (2010)

UNESCO biosphere reserve *Schorfheide-Chorin*

The UNESCO biosphere reserve

The biosphere reserve Schorfheide-Chorin is at 75 kilometers north-east of Berlin in the federal state of Brandenburg. In the area, all geo-morphological features of the postglacial lowlands of northern Germany can be found. The vegetation of the biosphere reserve is close to its natural potential encompassing mixed beech forests, oak-beech forests, pine-oak forests, and dry sub-continental grasslands. Apart from forests, many lakes, swamps and bogs

can be found. The forest “Grumsiner Forst” in the biosphere reserve is part of the UNESCO World Heritage Site “Ancient Beech Forests of Germany”, inscribed in 2011.

Some 32,000 people inhabit the biosphere reserve. The region is one of the least populated areas of Germany and has a high unemployment rate. The biosphere reserve administration has introduced a “regional brand” which has become the undisputed

quality trademark for products and services from the biosphere reserve such as food, catering, hoteliers and retail. Awarding the brand is based on criteria such as regional origin, quality standards and low-impact production methods.



The regional brand of the biosphere reserve

The role of water

While the area is one of the most arid in Germany, its impressive landscape is dotted with some 240 lakes and thousands of bogs. In the last few centuries most bogs have been gradually drained; nowadays, rehabilitation efforts are made. Still, there is considerable need to sensitize the youth as well as the population at large for the significance of protecting water resources. The four lakes in the biosphere reserve, the Lake Werbellin (Werbellinsee), the Grimnitzsee, the Parsteinsee and the Uckersee, are not only ecologically valuable, they are also important “communication tools” since they are popular tourist destinations.

The project: Objectives

A research and education/training vessel that can serve up to 50 peo-

ple at a time will be launched on the Werbellinsee in 2011. The 18 meter long catamaran is a floating laboratory and cutting-edge in terms of sustainable construction. As an education vessel, it will address issues such as water quality, water use and the diversity of nature in the waterbody of the Werbellinsee. All specialized issues will be embedded in a broad concept of Education for Sustainable Development.

The vessel is made from recycled aluminum and is powered by solar energy that drives a battery and two electric motors, each with about 7 kW. The solar panel is located on the roof. Under best conditions, the vessel will be able to operate up to 8 hours. The vessel is also resource-efficient in other aspects, thanks to its closed water systems on board, low energy consuming movement and to the non-toxic paint applied to its exterior. In addition to standard equipment, there is low-energy LED lighting and facilities to visualize the energy cycle in the ship.

The vessel can be used by school classes of all ages, university students and adults. The equipment used for each excursion is tailored to the age and specific needs of the student groups. A modular design allows easy and quick replacement of components. State of the art equipment for analyzing and evaluating water and sediment samples (microscopes, chemical analysis equipment, etc.) are on board. There will a glass-bottom

to observe what is happening under the water surface. The vessel will be operated on the Werbellinsee for at least the next 12 years. Sponsoring and funds from a federal economic stimulus package add up to more than 300,000 Euro for the solar vessel.

The project: Implementation

The project funding of Danone Waters complements the already financed “hardware” of the boat and the educational “software” through auxiliary technical equipment that optimally complements the range of equipment available on board: equipment for water analysis, digital microscopes, binoculars for students, storage containers, visualization devices, an underwater camera with video transmission and a sonar.

The project will exemplarily link “modern, smart technology” to educating about the importance of water for human beings and the ecosystem. The solar research vessel is a true “first”

in Germany. It will have an impact as best practice far beyond the region. Partners such as the German Association for Solar Energy will promote the project through nationwide dissemination of information.

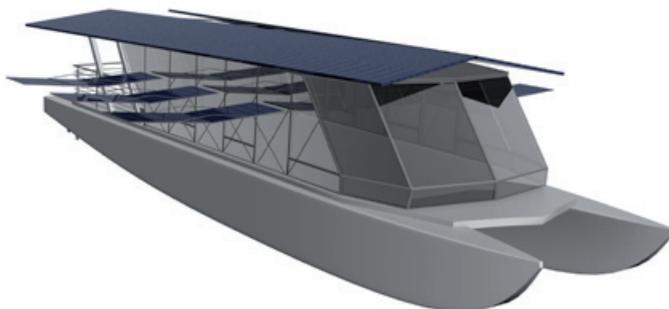
The biosphere reserve management in cooperation with its support association is accountable for implementing the project in its entirety. The funds from Danone Waters contribute to launching the vessel – in total a far more extensive project – through technology additions worth 31,250 Euro. The project will impart knowledge about the causes of change in the aquatic environment and will help to develop skills to protect water and water bodies.

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Model of the solar research vessel (© ALV 2011)



The Elbe river near Hitzacker in the biosphere reserve (Flickr CC HydaspisChaos)

Project summary

Forest conversion using horses (2010)

UNESCO biosphere reserve *Elbe River Landscape in Lower Saxony*

The UNESCO biosphere reserve

The different parts of Germany's largest biosphere reserve are administrated separately in each of the five federal states across which it extends. The biosphere reserve in Lower Saxony is especially important for swans and geese that use it as a resting and wintering area. Yet, many farmers consider the birds to be a threat to their crop yields. An important project of the administration of Lower Saxony in

recent years, combining interests of nature conservation and farmers, consists in introducing a "migratory bird management" in order to minimize conflicts and preserve the Elbe River Landscape as a bird resting area.

The biosphere reserve is also an important cultural landscape, comprising a World Heritage site ("Garden Kingdom of Dessau-Wörlitz") and several habitats of the EU network of protected areas "Natura 2000".

The role of water

Needless to say that water is the defining feature of the landscape in a fluvial biosphere reserve. The floodplains are regularly flooded in winter and spring, while the sandy shores often fall dry in late summer. For centuries dikes have protected the natural and cultural landscape of meadows, fields and settlements in the river area. The Elbe, its tributaries and a branching network of surface waters create a characteristic mosaic of valuable habitats along the lowland river.



The Elbe River Landscape is an important wintering area for swans and geese (Flickr CC Kinga)

The project: Objectives

The area concerned by this project in the Lower-Saxon part of the biosphere reserve is a creek valley in the “Hoher Drawehn”, a hilly landscape with heights and quite steep slopes, at least for Northern Germany. The creek “Ventschauer Mühlenbach”, its banks and an adjacent natural forest are habitats for many rare and

endangered species such as the otter or the kingfisher. Important parts of the valley are covered by near-natural vegetation but one quite long stretch along the creek had been planted many years ago with coniferous forest not adapted to the site. This forest exerted stresses on soil and groundwater and negatively affected biodiversity. In terms of water quality, it was particularly problematic that an area very suitable for groundwater recharge and water purification does not fulfill such functions adequately, as a consequence of an unsuited vegetation. The project intends to convert the forest into site-specific vegetation especially along the banks such that the ecosystem functions can be exercised again: groundwater and surface water protection, habitat conservation for typical lowland and riverine species. What makes this project special is that the project reaches these objectives through methods that have themselves a very low environmental impact and create economic added value.

The project: Implementation

The project restored the natural vegetation on the banks of the “Ventschauer Mühlenbach”. As groundwater is very near to the surface in the area, this has been done with particular care and by an unusual measure: the trees cut down from the pine forest were transported out of the area by horses. This minimized soil compaction and environmental pollution. The pine forest will be replaced (the project is still being implemented) by an alder and ash tree alluvial forest. The project

is carried out building on traditional skills of the inhabitants of the biosphere reserve and is also in this regard a model for future management measures.

The owner of the land is committed to maintain the newly developed forest according to the project objectives for a minimum period of 20 years. Parallel to the proposed project, a water development plan is underway for the valley. Setting up and implementing the process involved all stakeholders, with the support of the biosphere reserve management, providing the best conceivable framework for the overall project objectives.

Funding of 24,750 Euro has been provided to the project. A local

start-up company provided the horses and was responsible for animal-keeping. Parts of the funds are used for public relation materials. The project has already had TV coverage.

The project can also be a pilot for future nature conservation measures at sensitive locations (especially as regards groundwater) and also for integrating residents, relying on their traditional proficiencies. Involving local inhabitants will safeguard maintenance in the long run.

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With the help of horses, trees can be transported with low environmental impact. (© Klaus Mayhack)



A school boy active in the project (© Biosphärenreservat Spreewald)

Project summary

Water education in primary schools (2010)

UNESCO biosphere reserve *Spreewald*

The UNESCO biosphere reserve

The Spreewald has been designated as UNESCO biosphere reserve in 1991. Its characteristic is its park-like landscape interspersed with numerous streams and brooks. Despite centuries of human influence and cultivation of the landscape, it is still a largely natural floodplain habitat, and thus rich in flora and fauna. The whole area is hardly dissected by streets and sustains various rare species such as storks, otters and dragonflies.

At the same time, 50,000 people inhabit the biosphere reserve and the region attracts more than four million tourists a year. This makes it the most important tourist region in the federal state of Brandenburg. Nature tourism is thus a major economic pillar of the biosphere reserve and the tourism infrastructure includes hundreds of kilometers of trails for cycling, walking, and riding. Tourism also helps promoting the marketing of regional products. The biosphere reserve is

Germany's leading eco-farming region, with almost three-quarters of agricultural land being tilled according to organic standards. The pickled Spreewald gherkin is an emblematic dish of the region, famous all across Germany.

The role of water

The biosphere reserve is one of the few regions in Germany where climate change will definitely lead to greater water scarcity. Economical use of water is the key to future good water quality. Only flowing water provides living space for the species currently inhabiting it.

Water scarcity will lead to standing



Two boys experimenting with water
(© Biosphärenreservat Spreewald)

water and to the decline of the current species diversity. Therefore, a plan for sustainable consumption of water has been set up – formulated collectively by the local authorities and important user groups. Nevertheless, the necessity to save water

is not well known so far in the public at large and efforts to communicate the significance of water must be intensified; it is especially young generations that need to be sensitized for using water sustainably.

The project: Objectives

The project “Klasse - klares Wasser” (the translation is ambiguous by intention: “Clear water in class” or “Terrific – clear water”) supported by Danone Waters in 2010 communicates the topic “water” in a new exemplary way based on high-quality didactics. It started in spring 2011 with a group of fourth form students of the 3rd Elementary School of the city of Lübbenau. The idea is that issues related to water and its preciousness can be communicated very easily to kids of that age because they are very eager to try things out and thereby create awareness for a sustainable way of living in general.

The project: Implementation

In a first step during the school year 2010/11, students work in a project group and in interdisciplinary classes for 14 days. Three teaching modules (“Water is everywhere”, “Water locally and globally”, “Water knowledge”) are intended to raise awareness and develop skills and competencies of the students. In order to intensify the students' knowledge, different measures are taken, such as studies on the personal consumption of water, street surveys, online research, preparing presentations or drafting visualizations of water use in

school. Field trips to model projects will be organized as well; one of these projects is the cistern system in Burg, financed in 2009 from funds provided by Danone Waters; another field trip heads for the water purification plant of the city of Lübbenau.

Modules 2 and 3 of the course will be carried out during school year 2011/12. After that, there will also be an information exchange with other schools, including teacher trainings.

The project brings together many different partners from the region and is intended to have effects over several years. The responsibility for implementation is with the biosphere reserve administration in collaboration with the local citizens' foundation. The primary school's project group "Young Reporters" will regularly report on the progress of the project.

The project is also supported by public relations activities of the biosphere reserve. Coverage in the local media was given from the start.

This project on Education for Sustainable Development in the biosphere reserve Spreewald is funded with 37,700 Euro from the cooperation with Danone Waters. The means were and will be used mainly to purchase equipment, to design and print a workbook, to compensate the teaching personnel and to produce PR material. The project is an excellent example for innovative Education for Sustainable Development.

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Two girls and two boys analysing water probes (© Biosphärenreservat Spreewald)



Volvic für  



United Nations
Educational, Scientific and
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Man and
the biosphere
Programme



Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety



United Nations
Educational, Scientific and
Cultural Organization

German Commission
for UNESCO

UNESCO, Danone Waters Germany and the German Commission for UNESCO established a cooperation for the benefit of German biosphere reserves in 2008.

Danone Waters has provided financial support to ten selected projects in German biosphere reserves, on issues such as education, nature conservation or sustainable fishery. This brochure presents successful practices that might be replicated in biosphere reserves worldwide. It also demonstrates how a private sector collaboration can lead to tangible benefits in UNESCO biosphere reserves - as model regions for sustainable development.

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