

A Multi-Perspective Shift

In the Swedish municipality of Västervik, the initially simple idea of building rainwater retention ponds has evolved into the concept of “Mini Multi-dams”: making rainwater directly usable and creating many small basins wherever there are users for the water. This is because groundwater is at times scarce in this region, and such periods are becoming more frequent, while stormwater is not.

In Västervik, a coastal town of around 36,000 inhabitants at the southern end of the Swedish archipelago, people are rethinking water management. They are doing so with an instrument that appears quite unspectacular at first glance: retention ponds. As structures to mitigate the destructive power of stormwater, which has always been abundant around the Baltic Sea, especially in winter, and



The next stage: a "Mini Multi-dam"

is becoming even more so due to climate change, such ponds can be found in many places around the region. They have proved their worth in relieving sewer systems and preventing floods, and in protecting biodiversity and reducing nutrient loads before water is discharged into the sea.

In Västervik, however, something fundamental has changed in recent years. The key lies in a shift of perspective: why not make direct use of the stored water before it turns into groundwater? If rainwater is naturally pre-treated within a pond ecosystem and then distributed in a targeted way, it becomes an additional pillar of the local water supply – for example, to produce artificial snow for cross-country ski trails, or to irrigate sports fields, parks and cemeteries. In other words: water for the future.

Climate change has accelerated the shift in thinking

The challenges Västervik faces in the wake of climate change have also encouraged this shift in thinking. Heavy rainfall events and flooding have become more frequent, while in summer new weather patterns have emerged that were previously unknown in the area: extended dry periods that sometimes lead to water scarcity. Compounding the problem, the soil around Västervik is hard and absorbs water only slowly. Because of the geological structure of the subsurface, the region only has a small groundwater body to begin with. In recent years, the authorities have repeatedly had to temporarily prohibit residents from watering gardens with tap water. In short, the municipality had many reasons not to see the increasing oscillation between “too much” and “too little” water merely as a rising problem – but to recognise it as an opportunity.

As part of this rethinking, traditional retention ponds became “Multi-dams”. The word “Multi” initially referred to the idea that these basins would have an additional purpose: they are designed with tap points that allow water to be extracted and used. By developing conventional retention ponds into multifunctional sources of usable water, Multi-dams can become a stabilising element in the local water supply.

In the Gamleby district, the first Multi-dam went into operation as early as 2020. This multi-purpose pond collects surface runoff from a catchment area of

around 80 hectares, reduces flood peaks and at the same time provides water for nearby users. The opportunity to access water that was, at least initially, still free of charge did not go unnoticed. More and more users began to draw on it – from sports clubs with large grass pitches to private households with sizeable gardens.



*Anders Fröberg
Västervik Municipality*

Moving quickly from talk to action – and learning fast

However, that was not the end of the story. The further development of the Multi-dam concept within the WaterMan project has made something else almost textbook-clear: when it comes to water recycling, concrete, pragmatic measures can generate valuable insights very quickly. Anyone who moves swiftly from talking to doing often experiences a steep learning curve. In Gamleby, the first experiences revealed that the main challenge is not collecting the water, but transporting it to potential users. Long pipelines and numerous trips with tanker trucks are labour-intensive, costly and inflexible.

In the past, retention ponds in the Baltic Sea Region were usually built where it made most sense to intercept stormwater and prevent damage. Because water scarcity was not yet seen as a major issue, they were not planned with a view to where there might be high demand for recycled water. A paradigm shift was needed – and Västervik has consistently put it into practice. Instead of constructing a few large retention ponds, the municipality now focuses on many small “Mini Multi-dams” – each one located where water is needed: close to commercial areas, sports facilities, parks and residential neighbourhoods.

Anders Fröberg, project manager at Västervik Municipality, has been one of the driving forces behind this shift. “If the distance is small, a short pipeline is often enough. Otherwise, trailers have to transport the water to where it is needed,” he explains. The result of this close-range solution: lower costs, greater flexibility – and less use of drinking water. “Being right at the source means things are simpler, cheaper and more sustainable,” adds Fröberg.

The real innovation: decentralising the retention ponds

Success has had a knock-on effect: one solution became many, and one central storage point evolved into a decentralised strategy. In new development areas such as Åbyhöjden, rainwater is now even used for toilet flushing once it has been qualified as “technical water” – a common term in Sweden for usable water that does not meet drinking water quality. This saves groundwater and clearly demonstrates that many applications do not require drinking water quality. The real innovation lies in this decentralisation: it makes the system both more cost-effective and more adaptable. And the word “Multi-dams” gains another layer of meaning. Fröberg sums up the approach as follows: “We combine the two sides of the same coin – ‘too much’ and ‘too little’ water – and turn them into water security by building many small Multi-dams.”

The city has since been in close contact with sports clubs, housing associations, park maintenance teams and private individuals. Anyone who needs water is

included in the planning. And anyone who uses it is supported – through training sessions, feedback meetings and information materials.

Six Multi-dams have already been built in Västervik, four more are in advanced planning, and around ten additional “Mini Multi” locations are being developed for the longer term. With each new facility, a decentralised network of storage points grows, bringing rain back into everyday life as a resource. Sports facilities are particularly active in seeking access, as they have high water demand and benefit directly. Dialogue with urban planning is crucial in this context. In future land-use plans, Multi-dams are to be integrated at an early stage, as part of the municipal infrastructure.

The task ahead: developing a business case



The question of where the rainwater comes from is becoming all the more important. Water that runs off heavily trafficked roads or industrial sites is only used in exceptional cases and only after strict testing. According to project manager Anders Fröberg, the Multi-dam in Gamleby meets all the requirements for

microbiological safety. Other locations make additional use of wetlands or biochar filters to further treat the water alongside natural sedimentation. Natural treatment is an integral part of the solution: no chemical additives, no complex machinery, but nature-based solutions. “The water in the upper parts of the catchment area is simply cleaner. If we retain it there, we can start with simple, low-cost solutions,” explains Fröberg. For additional “next generation” sites, light disinfection stages (such as UV) have also been evaluated to enable a broader range of applications, for example for washing vehicle fleets. That option is there for the future. For now, however, straightforward uses such as irrigating public green spaces or private gardens already go a long way towards saving drinking water.

As yet, Sweden has no official guidelines for the use of decentralised rainwater. But Västervik is setting practical standards that show: it is possible without

excessive bureaucracy when political will, technical know-how and pragmatism come together.

In this context, the question of pricing recycled rainwater from Multi-dams is still entirely open. Until now, the water has been provided free of charge. In the future, according to the current state of debate, moderate fees, pooling the demand of several end users, and special offers for local businesses could help to finance the maintenance and expansion of the Multi-dam network. A business case will have to be developed. But for that to happen, municipalities and public utilities in Sweden must first be given a legal basis to charge varying prices for different water qualities.

Multifunctional tools for water resilience in the Baltic Sea Region

What already makes the system compelling today is its high transferability. Retention ponds are widely known across the Baltic Sea Region, but so far they have mainly been used for flood control or biodiversity. The potential to tap them as sources of fit-for-purpose water where drinking water quality is not required is enormous and, in many places, still largely unused.

Västervik offers a blueprint here, showing how the classic flood control instrument of stormwater retention ponds can be turned into a flexible, adaptable and highly practical approach to local water recycling. Multi-dams as multifunctional tools for water resilience in the Baltic Sea Region.

Start with sports fields and lead by example

Fröberg's advice to other municipalities that want to get started is equally pragmatic: "Begin with sports fields. That's where demand is high, acceptance is usually strong and the impact quickly becomes visible to many people." It also helps when municipalities lead by example – for instance by irrigating young trees and summer flowers with recycled water – while actively supporting pioneering private users and showcasing good examples publicly. This way, people begin to understand that rainwater is a local resource – not an unwanted surplus to be disposed of as quickly as possible.

In Västervik, the question is no longer if water should be recycled, but how. With the concept of "Mini Multi-dams", the municipality has found a convincing answer: store rainwater where it is needed and turn a problem into a resource.

About the WaterMan project

WaterMan promotes a region specific approach to water recycling, which intends to use the alternation of too much and too little water that has become typical in the Baltic Sea Region to make the local water supply more resilient, and supports municipalities & water companies in adapting their strategies.

More information: <https://www.eurobalt.org/WaterRecyclingToolbox/>
<http://interreg-baltic.eu/project/waterman>

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Co-funded by
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