



Integrated Water Resources Management: Practice in Switzerland

Mainstreaming and Sustainability

Water is probably the most important natural resource in Switzerland. Swiss water policy developed through many laws and ordinances on and relating to water, including legislation on forest management, spatial planning, agriculture, nature protection, waste management and chemicals. The Integrated Water Resources Management in Switzerland aims to bringing together three principal sectors

Flood protection – Water use – Water protection

The Federal Law on Water Protection is based on comprehensive protection of the hydrological cycle, and it establishes a series of qualitative and quantitative targets for the protection of the physical and chemical quality of water, hydrological conditions, human, animal and plant health, supply for essential purposes, the protection of biotopes and landscapes, irrigation and leisure. This law must be seen a part of the framework for integrated water resources management, which also completed by further legislation on Flood protection and Exploitation of Hydroelectric Power.

Switzerland emphasizes the ecosystem approach as the first, cheapest step to ensure a sustainable water supply of good quality. Ecosystems that naturally capture, filter, store and release water, such as wetlands, forests and soils, should be protected and used in a sustainable manner.

Description of the Initiatives

Forests for water: In Switzerland, forests are protected or used sustainably in order to provide water of good quality or to mitigate flooding. In forests, the use of fertilisers is prohibited and pesticides are only allowed in a few exceptional cases such as to protect felled logs from the bark beetle. Landfill sites in forests are forbidden. In forestry, conventional lubricants and fuels are increasingly being substituted in favour of environmentally friendly products. 42 % of groundwater protection zones (zones where activities are forbidden or limited) are located in forests.

The best drinking water comes from the forest

In Altdorf, in the Canton of Uri, the upper watershed is a protected wetland where water collects to form a stream, which soon disappears under the protection forest. This forest not only protects the city from falling stones, landslides and avalanches, but also filters the water through its soil and provides three quarters of the clean drinking water needed. In addition, due to the steep mountain slopes, the water collected turns the turbine of a small hydropower plant providing 1.5 million kWh per year, covering the needs of 300 households.

A natural water filter for the city of Basle

In the city of Basle (156,000 inhabitants), the quantity of groundwater is insufficient to meet the city's needs. Some 120,000 m³ water per day from the River Rhine are treated through a mechanical filtration installation equipped with a quartz-sand filter to remove the sediment. It then runs into small channels through a forest where it is infiltrated into the subsoil and thereby cleaned before reaching the groundwater.

Forests for flood mitigation

In the canton of Ticino, the River Cassarate has caused flooding, mud-flows and rock-falls, endangering the villages in the valley as well as the city of Lugano. The causes were clear: intensive agriculture and over-exploitation of forests. After 120 years of reforestation, extensive agriculture, the surface of the stabilizing forest has been almost tripled, thus reducing the risks.

Soil protection for water quality: Swiss farmers are compensated financially for the ecosystem services that they provide by switching from intensive to extensive farming, reducing the run-off and leaching of nutrients and pesticides to rivers and groundwater.

Incentives for nitrate reduction

In the middle of the 1990s, the village of Wohlenschwil in the Canton of Aargau had too much nitrate in its drinking water (53 mg/l). The intensive cultivation of 23.5 hectares of land in was stopped and the arable land was transformed into unfertilised meadows. Thus, the nitrate content was effectively lowered to 25 mg/l. The farmers are compensated for their losses in earnings by means of a payment for ecosystem services of SFr 2,000 per hectare per year.

Renaturalized rivers for biodiversity and flood control: The return of rivers to their natural state is underway, to provide more room for flood plains or to reinstate previous ones, thus increasing biodiversity, improving water quality and preventing damage from flooding.

Compensation for river protection

In the canton of Berne, the Brook Lyssbach has undergone various renaturalization steps. A buffer zone was established along the river banks by practising extensive (non-intensive) agriculture, thus reducing the leaching of nitrate and phosphorus while compensating the farmers for these environmental services.

Renaturalization of the River Moesa

In Pascoletto (Canton of Grisons) numerous structures were built in the 1900s to protect the railway line, the national road and farming land from flooding of the River Moesa. The alluvial zone was impacted, the river-bed eroded and the groundwater level lowered. Between 1998 and 2000, 600 m of the river were enlarged, the artificial structures were removed or placed further from the river, and its banks were lowered. At the same time, landfill sites were removed from the alluvial zone. This created new flood plains for the river. These new biotopes provide a habitat for amphibians and typical alluvial vegetation. The whole project, financed by the Confederation, the canton, the communes, the Swiss National Fund for Landscape and Pro Natura (an environmental NGO), cost a total of US 684'000.