

Restoring Green Infrastructure on the Linth River Switzerland

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Background

Floods have been a constant danger for those living on the Linth River, located approximately 50 kilometers outside of Zurich in Northeastern Switzerland. A tempestuous river fed by snow-melt from steep alpine streams, the Linth River flows 50 kilometers through a narrow valley before draining into the Lake of Zurich. In the late 1800s industrialization of the textile industry, mixed with impacts from forestry and agriculture, created a perfect storm for flooding, especially in the springtime. In the early 19th century, the Linth River was relocated to a straight channel, as seen in the picture above, with an overflow channel constructed to send excess floodwater to nearby Lake Walen. This widely celebrated engineering project, designed by the Swiss scientist Conrad Escher, reduced flooding, dried wetland areas, improved navigation and increased space for agriculture. This was just one of many similar projects in Switzerland, contributing to the loss of 95% of historic wetland areas.

Quick facts

Zone	Northeastern Switzerland
Key Words	Floods, green infrastructure, ecosystem conservation
Topic	Environment restoration
Implementing Agency	Swiss Cantons and Federal Government

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Room For Improvement

While projects like the channelization of the Linth River clearly improved the economic status of some Swiss citizens and decreased flooding risks, it also negatively impacted the amount and quality of ecosystem services provided by the river's once active floodplain. At the time of construction, wetlands were viewed as unhealthy wastelands, but now they are considered vital places on many levels. Wetlands act as nature's kidneys, removing pollutants and sediment from the water; in fact, the city of Zurich is one of many cities that depend on Lake Zurich's water, which is fed primarily by the River, as their main source of drinking water. Further, wetlands are considered hotspots for a diverse set of plants and animals, providing vital habitat for breeding, feeding, and resting for migratory and resident species – and a compelling place for locals and tourists to spend time.

In addition, floodplain wetlands have been increasingly recognized for their role in flood protection based on their ability soak up then slowly release floodwaters. Channelized rivers simply funnel excess water downstream – thus, floodwater simply gets pushed from one area to another. As the original Linth reengineering ages, major floods still occur in the area, causing millions of dollars in property damage – a situation that is predicted to worsen as a result of climate change.

Restoring green Infrastructure

Today's river engineering practices have evolved from a "command and control" approach to a more ecological tactic that capitalizes on the natural capacity of the ecosystem to mitigate flooding. Recognizing both the value of wetlands to control floods and the co-benefits they bring, a consortium of Swiss Cantons and the federal government began the process to modify the work of Escher to meet 21st century standards in 2008.

Over the course of five years, a complex reengineering of the river took place, costing over USD 110 million. However, the project is viewed by the Federal Department of the Environment, Transport, Energy and Communications as a long-term investment in flood control that will sustainably protect property, infrastructure and agricultural land worth an estimated USD 340 million.

The project's primary goals are the health and safety of people along with the conservation of the environment. The design focused on strategic openings in the original canal's banks, providing areas where the river could expand into side channels, much like the original river's path. Side channels are particularly vital areas for wildlife, providing refuge from strong currents where young fish, frogs, and insects can safely grow. The side channels have been planted with trees, shrubs and forbs, providing additional habitat and pollution uptake capacity.

The project also made an investment in recreation by installing and/or upgrading walking paths along the river. Now residents and tourists can easily walk along the river to exercise, view wildlife, or swim in the summertime. Educational signage along the trail educates the public about the many benefits of the project and the history of the Linth.

Conclusion

By designing the Linth River restoration project with people, climate change, the economy, and the environment in mind, the Swiss government invested in a long-term solution to the flooding problem that provides multiple co-benefits. As the population of the Zurich-area expands, such green infrastructure projects represent smart urban growth, economically and environmentally. Further, this project's relative simplicity makes it a model for the other channelized rivers in Switzerland and beyond.



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