Management of water bodies in the changing environment

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In the next few years the Swiss society will face three main challenges regarding the ecological integrity of our waters: (i) maintenance of the water quality infrastructure, (ii) increasing pressure on ecosystems and (iii) revitalization of rivers. Currently our waste water is collected in ~48,000 km long sewers and processed in ~760 treatment plants. With replacement and annual costs for operation and maintenance OPM of those systems of CHF 100 billion and ~1.7 billion CHF yr^{-1}, respectively, our future generations will be tempted for compromises. In addition, several 100 mio CHF will be needed for the envisaged removal of micro-pollutants.

Recently, the interest in Swiss hydropower has experience a twofold renaissance. The Parliament wishes to expand renewable electricity production by 5,400 GWh yr^{-1} and has allocated 250 mio CHF for the Kostendeckende Einspeisevergütung (KEV, compensatory feed). The attractive KEV has triggered a flood of proposals for using streams / rivers in small-scale plants and has put the cantonal agencies under enormous tension. If all proposals would be realized, the effect on the ecosystems would be devastating. The second interest is in the future use of pump-storage (PS) units, such as the currently operated one between Grimsel and Oberaar und the one under construction between Limmern and Muttsee. More critical will be schemes where the lower basin is a natural lake, as proposed by Repower for a 1000-MW PS unit between Lago di Poschiavo (960 m asl) and Lago Bianco (2230 m asl) in Puschlav. A careful panning will be needed to maintain Lago di Poschiavo's natural temperature and particle regime.

Thirdly, the Bafu (Federal Office for the Environment) is determined to revitalize some of the ~14,000 km long streams and rivers, which are currently classified as "highly degraded". Besides the finances (~100 mio CHF yr^{-1} split between local and federal Gov.) the great challenge will be finding ways to balance the interests of agriculture, flood-protection and ecological integrity. The limited space in our narrow valleys is unfortunately a reality.

Towards the end of the presentation, those challenges will be set in relation to the global ones of (i) coping with climate change, (ii) producing enough electricity and (iii) irrigating enough land for increasing the living standard of those mostly underprivileged people.