SILMAS

Sustainable Instruments for Lakes Management in the Alpine Space

- AS priority area: Environment and Risk Prevention
- Duration: 01/09/2009 - 31/08/2012
- *Project webpage no longer accessible*
- Project on the website of the Alpine Space Programme

Project Partners

- **Lead Partner:** Région Rhône-Alpes (Rhône Alpes Regional Authority) (FR)
- Local authority for Annecy lake purification (FR)
- Local authority for Bourget lake purification (FR)
- Provence-Alpes-Côte d'Azur regional Council (FR)
- Joanneum Research Forschungsgesellschaft mbH, Institute of Water Resources Management (AT)
- Regional Government of Carinthia, Department Environment (AT)
- WissenschaftsAgentur / University of Salzburg (AT)
- Institute for Lake Research, State Institute for Environment, Measurements and Nature Conservation Baden-Württemberg (DE)
- Environmental Protection Agency of Trento (IT)
- Regional Agency for Environmental Protection of Piemonte (IT)
- Tourist District of Lake (IT)
- ERSAF - Ente Regionale per i Servizi all'Agricoltura e alle Foreste (IT)
- Lombardy regional authority, General Directorate for Environment, Energy and Networks (IT)
- National Institute of Biology - Department for Freshwater and Terrestrial Ecosystems Research (SI)
- University of Nova Gorica, School of Environmental Sciences (SI)

Project summary

“Natural and artificial lakes are a main characteristic of the Alpine Space and belong, with their catchment areas, to the European heritage. During the last decades, authorities in charge of lakes management worked to preserve and restore this heritage and its natural resources. They now have to anticipate climate change impacts. SILMAS, by exchanging good practices and testing new methods, will supply its 15 partners with efficient tools for reaching goals of the framework directives (Water and Natura 2000) and the Alpine Convention:

- creation of a virtual laboratory, to define current ecological state of the lakes and anticipate changes due to climatic and biological dynamics,
- assessment of existing governance tools dealing with regulation of land/resources and conflicts solving, then testing decision-making instruments in different lakes sites,
- production of information and education tools for sustainable lakes management and uses, dedicated to decision makers, stakeholders and the young public.”
  Source: SILMAS project summary

Hypotheses

- Sector policies need to be coordinated to prevent exploitation of natural resources and single-sector economies
- Sensitive Alpine territory requires appropriate and diversified measures (consensus-oriented multi-stakeholder approach)

Keywords

- water management
- governance
- climate change
- institutional learning
- pollution

Topics

- Enhancing and protecting natural resources and heritage
- High quality tourism
- Limitation of natural disaster impacts
- Reducing environmental damage

Results

Results of a project can be differentiated in outputs, outcomes and impacts of an intervention.
Source:OECD Glossary of Key Terms in Evaluation and Results Based Management.

Outputs

Output	Category	Language(s)	Target group	Remark
Climate driven scenarios (air temperature, precipitation), Climate Change Impacts on Alpine Lakes (Part 1), pg. 44ff	methodology/data	EN	Scientists	n/a more about climate driven scenarios
Model ecosystem for small mesotrophic and eutrophic sub-alpine lakes (nutrient, phytoplankton, zooplankton etc.), Climate Change Impacts on Alpine Lakes (Part 1), pg. 51ff	methodology/data	EN	Scientists	n/a more about model ecosystem
Hydrodynamic climate impact lake simulation study (HCILS), Climate Change Impacts on Alpine Lakes (Part 1), pg. 79ff	methodology	EN	Scientists	The model, which has been developed in the Netherlands, has been adapted to Alpine conditions and tested in three Alpine pilot sites: Lake Constance, Wörthersee, Lago di Viverone. more about HCILS

Output	Category	Language(s)	Target group	Remark
Climate scenarios for study sites Lake Constance, Wörthersee, Lago di Viverone , Climate Change Impacts on Alpine Lakes (Part 1), pg. 87ff	data	EN	Scientists	Small variations in the climate conditions have remarkable effects. The results of HCILS can be used to assess a lake actual state, and they show what can be expected in the future. The water balance and residence time in alpine lakes are very sensitive to changes in air temperature and precipitation. A temperature increase of 1.4 °C until 2050 produces reductions in lake water renewal of 12 to 23 % of the annual mean (summer change is much higher with partly > 81 %. The superposition with only small decreases in precipitation (5 %) produces important reductions of lake water renewal up to more than 40 % annual mean, summer change is even higher with partly > 117 %). Land use changes (p.e. reforestation) can increase significantly these water losses (future research demand). Consequently the fill up time and mean residence time of lake water are increasing. Small lakes with small catchment areas are more sensitive to climate change. The mean residence time of lake water is not in accordance with the water renewal (or fill up) time of lakes. Its work of the limnologists to interpret the impact of these changes on the ecological and quality conditions of lakes. more about climate scenarios for study sites
Hydrological water balance modelling, Climate Change Impacts on Alpine Lakes (Part 2), pg. 117ff	data	EN	Scientists	Time intervals for theoretical exchange of water volumes (fill up time) increases. For study lakes, it ranges from 2.2 years to 20 years. more about hydrological water balance modeling

Output	Category	Language(s)	Target group	Remark
Investigation of lake circulation and residence time of deep lake water using environmental isotopes, Climate Change Impacts on Alpine Lakes (Part 2), pg. 141ff	data	EN	Scientists	Lake ciruclation and residence time are increasing under the conditions of climate change. more about lake circulation and indicators
Identification of climate change indicators in regard to Alpine lake monitoring, Climate Change Impacts on Alpine Lakes (Part 2), pg. 173ff	methodology	EN	Scientists	n/a more about climate change indicators
Adaptation and mitigation options for Alpine lakes (sectors agriculture, fishing, forestry, urban development, power generation, recreation and tourism, navigation), Climate Change Recommendations from SILMAS	policy recommendations	EN, IT, FR	Planner	Spatially relevant processes and mitigation measures in a brief booklet: e.g. agriculture (higher precipitation ⇒ need for irrigation, more intense events ⇒ soil conservation, protection of water courses), urban development (adaption of sewage to extreme events and algae, infrastructural adaptations), recreation/tourism (heavier use of shore zones ⇒ water contamination counter-measures, access to water in low-level times) more about adaptation and mitigation options
Alpine Lakes Database , Climate Change Impacts on Alpine Lakes (Part 2), pg. 179ff	policy recommendations	EN, IT, FR	Planner	“Environmental database (morphologic information,residence time, trophic state…) with the following tools: Basemaps to identify the position of the lake in the Alpine Space (possibility to chose between a large variey of basemap), Measure tool (Area, Distance and Location), Share tool (E mail, Facebook and Twitter), drop-down menu to choose the lake. Database is currently not accessible on project website” more about Alpine lake database

Output	Category	Language(s)	Target group	Remark
Guidelines for lake and port management practices , SILMAS Environmental Management of Ports: Alpine Lakes Experiences, pg. 17ff	Guidelines	EN, IT	Policy makers / civil servants / planners	The guidelines address sediment removal management, macrophytes overgrowth management and protection, pollution and invasive species. more about guidelines for lake and port management
Toolbox Conflict solving governance , Lake management: conflict solving governance, pg. 17	Tool	EN, IT	Planner / civil servants	“The term “Toolbox” is used to refer to the digital system (linked to the knowledge map of WP 5 5) or documentation (ring-binder or similar) created to classify the means or “tools” used for lake management, by status (document-judicial status, financial, educational etc), origin (European, national, local), thematic (fishing, ports) etc.The tools are additionally analysed in view of their transferability and capacity. Thematic issues addressed include wareness raising, climate change, Fishery, Lake management, eisure.activities, Navigation, Shore zone, Water level management, Water quality” more about the toolboox
Knowledge map (SILMAS knowledge management application), Lake management: conflict solving governance, pg. 18	Map	EN	Planner / civil servants	Map contains all project tools. Link http://silmas.technodat.co.at is not valid. more about the knowledge map
Application of the shorezone functionality index to study lakes, Lake management: conflict solving governance, pg. 18	Indicator	EN, SI, IT, FR, DE	Scientists	The Shorezone Functionality Index (SFI) is an index that evaluates the capacity of the area located just adjacent the lake shore to accomplish determinate ecological functions, such as the purification of waters coming from the surrounding watershed and their apacity to host aquatic animals. The Index has been developed by ISPRA-(formerly APAT) Working Group, not by the SILMAS project. more about application of the shorezone functionality index

Output	Category	Language(s)	Target group	Remark
Macro-regional strategy for an Alpine Space roadmap of the Alpine regions, Lake management: conflict solving governance, Annex 5, pg. 148	(policy) recommendations	EN	Policy makers	Advantages of an inter-regional analysis and respective sub-objectives in view of a macroregional strategy for the Alps more about macro-regional strategy

Outcomes and Impacts

Not recognised synergies

- It will be necessary to maintain databases and websites on the internet even after the project period.
- Many of the practitioner-oriented outputs seem to be useful but are not accessible anymore.

Achievements that could be further implemented

- Not only providing better access to the research results, but proactively informing potential stakeholders.

Remaining gaps

- There are no other major gaps (apart from the bad data accessibility and missing practitioner orientation).

Emerging contradictions

- If supporting SSD is a major goal, then the result's usefulness should be better underlined. At the moment there is a strong focus on purely scientific outputs.

Accessibility of project results

- *SILMAS website no longer accessible*
- SILMAS outputs on the website of the Alpine Space Programme

Synergies

- Understanding water cycle
- Tourism

climate change, water management, governance, education, institutional learning, pollution, EU project