alpenkonvention • convention alpine
convenzione delle alpi • alpska konvencija

Tagung der Alpenkonferenz
Réunion de la Conférence alpine
Sessione della Conferenza delle Alpi
Zasedanje Alpske konference

XV

TOP / POJ / ODG / TDR

A4

OL: EN

ANLAGE/ANNEXE/ALLEGATO/PRILOGA

4

alpenkonvention • convention alpine
convenzione delle alpi • alpska konvencija

REPORT OF THE

Working group Mountain Forest

on the 2016-2019 mandate

1. Overview of 2016-2019 mandate or relevant decision of the Alpine Conference

Brief summary of the main activities according to the 2016-2019 mandate or relevant decision of the Alpine Conference
• Organization and chair of the 4 meetings of the working group. • Collection of policies and best practices on the role of alpine forests on the path to a sustainable economy as contribution of the forest sector to the green economy (first report of the mandate). • Description of the interdependencies between the protective mountain forests and the protected sectors of " freshwater provision" and "flood protection" (second report of the mandate). • Participation in communication events.

2. Meetings

Summary of the meetings
• 27th- 28th April 2017 – Tolmezzo (Udine) – Italy. • 23th- 24th October 2017 - Bad Reichenhall – Germany. • 28th- 29th June 2018 - Santo Stefano di Cadore (Belluno) – Italy. • 12th- 13th December 2018 - Ljubljana – Slovenia.

3. Activities carried out

Report on activities carried out (including meetings, conferences)
The mandate was implemented through the organization of the 4 working group meetings, two per year. The meetings of the working group were associated with events that allowed participants to see situations related to the mandate of the Alpine Convention and to take contact with local alpine situations and local institutions. In particular: • 30th and 31th of January Vienna (Austria). The presidency of this working group on mountain forests participated at the beginning of the mandate 2017-2018 at the coordination meeting of the chairpersons of the working groups and platforms i, promoted by the Austrian presidency of the Alpine Convention. • 2nd March 2017 Brescia (Italy). In order to allow better dialogue and interchange between the different components of the Alpine Convention, platforms and working groups, this presidency participated in the meeting promoted Italian Coordination Table of the Alpine Convention. • 27th April 2017 Tolmezzo (Italy): the first meeting of the working group was held in Tolmezzo as this city was the site of the Alpine cities of 2017 http://www.alpenstaedte.org/en. • 28th April 2017 Visit in Pesarina Valley (Italy) to enable members of the working group to a local reality of wood short chain from the forest to finished products: the case of the wood company network “12tomeny” www.12tomany.net/en/ that with its wooden house built with the short and certified environmental chain has been selected in 2018 among the best practices in a project for the EUSALP on alpine wood and also included in a road show between France, Switzerland, Germany, Italy and Slovenia. • 24th October 2017 Bad Reichenhall (Germany) For the second meeting of the working group, the planning of its was made to coincide with the date of the conference about “Flood protection through protection forests in the Alpine Region” organized by Bavarian State Ministry of Foold, Agriculture and Forestry and Bavarian State Ministry of Environment and Consumer Protection. In this conference the presidency of the mountain forests working group held its own presentation referring to the first contents about one of the two reports covered by the mandate 2017-2018. • 22th -23th February 2018 Bolzano (Italy) With regard to specific communication

actions, the presidency of the working group for the mountain forests of the Alpine Convention participated in the XV Convention of the Italian Association of Agricultural Scientific Societies, at the University of Bolzano. On this occasion a roll-up was presented and exhibited illustrating a work carried out by the presidency of the Alpine forests working group of the Alpine Convention and the Italian environment ministry on the situation of effective application in Italy of the provisions of the Protocol on Forests of the Alpine Convention .

- 28th June 2018 - Santo Stefano di Cadore (Belluno) – Italy For the third meeting of the working group, the planning of its was made to coincide with the date of the conference about “the silvuculture in the alpine forests - green economy and functions of environmental protection” organized by Italian Delegation to the Alpine Convention. In this conference the presidency of the mountain forests working group held its own presentation referring to The Protocol of the Mountain forests of the Alpine Conventionand, the National board on wood supply chain and the new Italian forestry law.
- 29th June 2018 - Santo Stefano di Cadore (Belluno) – Italy. To give the members of the working group the opportunity to know the local forester realities, were planned two visits: the one about “the silviculture in Comelico Valley: types treatments in disetaneous and monoplane forests” and the second one “When the forest becomes intrisve. The evolution of the forest in the last 60 years. Advantages and disadvantages”.
- 13th December 2018 - Kranjska Gora– Slovenia. To give the members of the working group the opportunity to know the local forester realities, were planned, within the “coordination meeting” of the Interreg Alpine Space project “GreenRisk4Alps some visits between Ljubljana and Kranjska Gora, to observe the consequences of recent rockfall and torrential activity (villeage of Belca), challenging management of woody debris in the river bad and large amounts of bed load transport (Pišnica river), a short vist to the Municipality Kranjska Gora.

4. Results and outputs

Description of main results and outputs achieved
• The two reports provided for by the mandate were made and some events were organized with the local realities in which the participants were informed about the aims, objectives and activities of the mountain forests working group and the alps convention in general. In this sense, the objective of making a reality known as the one of the Alpine Convention not known in detail has been achieved. • Another goal achieved was the involvement of the Republic of Slovenia, which also actively participated in the organization of events, while a first contact was possible with France, but no contributions were made to the organization of events and the preparation of the reports. The common work of Germany, Austria and Italy is consolidated and very good. Now it is necessary to work to identify better synergies and achieve greater and further involvement of the partners, especially those who have never been present at the group's initiatives.

5. Cooperation

Description of cooperation initiatives and activities with other Alpine Convention Thematic Working Bodies and other relevant bodies and processes (e.g. EUSALP)
• 5th – 6th October 2017 – Gmunden (Austria). On behalf of the Chair of the Alpine Convention's Working Group on the 'Macro-regional Strategy for the Alpine Region, the presidency of the working group on mountain forest partecipated to the joint Exchange Workshop of the working bodies of the EUSALP and the Alpine Convention under the overarching theme "Generating innovations through sustainable use of Alpine resources". The main objectives were: o to facilitate a structured exchange between the Working Groups/Platforms of the Alpine Convention and the Action Groups of EUSALP based on their current mandates, work plans and activities; o to identify cooperation potentials, possible synergies and needs for cooperation and, in an outlook on the next working period, to explore possible joint future projects and activities; o to identify possible options how to further continue with the organisation of exchange and cooperation between AC and EUSALP. • 10th – 11th September 2018 – Vienna. The Austrian Presidency of the Alpine

Convention and Chair of the Working Group ‘Macro-regional Strategy for the Alpine Region organized the 2nd Exchange Workshop of the working bodies of the EUSALP and the Alpine Convention. The presidency of the working group on mountain forest partecipated and discussed in more detail the challenging need for a better alignment of the different working programs, action plans and cooperation opportunities of the “Alpine Family”. The discussions have concerned the five thematic priorities of the Multiannual Work Programme 2017-2022 (MAP):

- ✓ Priority 1: Focusing on people and culture
- ✓ Priority 2: Taking action on climate change
- ✓ Priority 3: Conserving and valuing biodiversity and landscape
- ✓ Priority 4: Greening the economy
- ✓ Priority 5: Promoting sustainable transport

Having assumed the mandate, from different bodies, of chair of the working group for the mountain forests 2017-2018 on behalf of the European Group of territorial cooperation Euregio without borders and that of member of EUSALP in the action group 2 (focus on "bioeconomy" and "alpine wood"), on behalf of the Autonomous Region of Friuli Venezia Giulia, I have seen how much greater synergy is still needed between these two bodies for a successful joint work.

The meetings allowed to compare ideas and points of view. It is however necessary to make these meetings more finalized and frequent, also through systems such as Skype conference or web conferences, to optimize time and to try to realize also concrete and common initiatives on the territory, making it understand (doing even more than the amount that already is done), the importance and usefulness of these organizations that promote the sustainable use of the Alpine territory and the surrounding areas.

6. Attachments

List of the documents attached to the report
• 27th April 2017 – Tolmezzo (Udine) - Italy minutes of meeting of the WGMF. • 23thOctober 2017 - Bad Reichenhall – Germany conference presentation. • 24thOctober 2017 - Bad Reichenhall – Germany minutes of meeting of the WGMF. • 28thJune 2018 - S. di Cadore (Belluno) – Italy minutes of meeting of the WGMF. • 28thJune 2018 - S. di Cadore (Belluno) – Italy conference presentation.

- 13th December 2018 - Ljubljana – Slovenia minutes of meeting of the WGMF.
- REPORT 1 Interdependencies between the protective mountain forests and the protected sectors of " freshwater provision" and "flood protection”
    - part 1: Interdependence between mountain forests and freshwater provision (coordination by Enrico Calvo)
    - part 2: Interactions between mountain forests and flood protection (coordination by Stefan Tretter with collaboration of Francesco Della Giacoma)
- REPORT 2 contribution of the forest sector to the green economy (coordination Rinaldo Comino with collaboration Luca Cetara).

Meeting of the WG Mountain Forest of the Alpine Convention

Tolmezzo (UD - Italy), 27th -28th April 2017

Attendees in the meeting

NAME	
Rinaldo Comino	*Presidency of Mountain Forests WG – Italy (EGTC Euroregio Without Borders)*
Hubert Siegel	*Austria*
Stefan Tretter	*Germany*
Enrico Calvo	*Italy – Head of the Italian Delegation*
Francesco Dellagiacoma	*Italy – expert of the Italian Delegation*
Maria Teresa Idone	*Italy – expert of the Italian Delegation*
Giulia Gaggia	*Permanent Secretariat*

Not participating in the meeting (excused):
Paolo Angelini – Italy
Davide Pettenella – Italy
Patrick Insinna – Liechtenstein
Christoph Dürr – Switzerland
Claire Morlot – France
Philippe Joanelle – France
Karin Enzenhofer – WWF
Zoanetti Roberto – Arge Alp

Agenda of the meeting

27th of April

15.00 – 15.15 Greetings from Mr. Francesco Brollo the Mayor of Tolmezzo and President of the Intercommunal Union of Carnia and presentation of the activities planned for the Celebration of Tolmezzo Alpine Town of the Year 2017.

15.15 – 15.30 Presentation of the new mandate of the working group "Mountain forests" for the period 2017-2018 by Mr. Rinaldo Comino (EGTC Euroregio Without Borders - Autonomous region of Friuli Venezia Giulia and Presidente of the WG Mountain Forests).

15.30 – 17.30 Discussion on the mandate and operational proposals of the members of the WG for the biennium 2017-2018.

28th of April

9.00 – 12.30 Field trip of a local reality of wood short chain from the forest to finished products (SaDiLegno) coordinated by Mr. Verio Solari (Forest consultant in Tolmezzo).

Provisional work plan shared by emails before the meeting

Provisional work programme for the next two years:

- **1° meeting of the WG** 27- 28. 04.2017 Tolmezzo
- **2° meeting of the WG + I° WORKSHOP** October 2017. Proposed issues to be discussed in the first Workshop: forestry –wood; carbon storage in wood products; renewable wood energy; sustainable tourism, new vision of forests and use of wood in the accommodation structures.

- **3° meeting of the WG + II° WORKSHOP** February 2018 focus on the topic of the Ecosystem services of Alpine forests describing the interdependencies between the protective mountain forests and the protected sectors in the fields of "freshwater provision" and "flood protection". Eventually, it would be interesting to understand if the WG prefers to have the technical conference – suggested by the Austrian Members of the WG and included in the Mandate 2017-2018 - or a workshop on these themes.
- **4° meeting of the WG** May /June 2018 in order to finalize the two reports that the WG has to produce in line with its mandate and to discuss about the new draft Mandate 2019-2020. All this material (2 reports + new mandate) has to be submitted to the next meeting of the Alpine Conference (October/November 2018).

Other relevant international events where the participation of the WG (by the Presidency or one of the member experts of the WG) could be promoted in order to present the results achieved in these last four years:

- Seminar organized by Alliance in the Alps and CIPRA Italia in Vallarsa (Trento) on 5th May 2017 dedicated to forests and climate change
- XI National Congress of the SISEF (Italian Society of Silviculture and Forest Ecology) in Roma 10-13 October 2017 where we may be able to present the reports produced by the WG (before the end of April we have to submit our proposal to the organizers)
- October 2018 on the border among Italy –Austria and Slovenia organize an event among all the alpine forestry organisations (or at least the members of the WG) to celebrate the end of the First World War (to organize internally).
- Symposium von flood-protection and Mountain Forest (23./24.10.2017) in Bad Reichenhall (Germany) under the framework of the EUSALP.
- the 4th European Forest Week taking place in October 9-13, 2017, in Warsaw, Poland and organised by UNECE/FAO (suggested by Christoph Dürr– CH)

Minutes of the meeting

Introduction and overview – Presidency

The new President of the WG welcomes the participant recalling the main items of the agenda. The idea is to have brief presentation of the members of the WG, an overview of the WG mandate 2018-2019 and a discussion in order to identify a tentative work plane starting from the Presidency proposal already shared by e-mail before the meeting.
In order to collect the contribution of the members not participating in the meeting, the Presidency intends to have an e-mail consultation and have a consolidated work plan by one month by the minutes. The participants agree with this proposal.
The Presidency underlines that the organization of this first meeting was in the frame of the event of Tolmezzo Alpine Town of the Years 2017, and the way to organize the meeting within a wider event on the Alpine environment is a good approach to be taken into account also for the next meetings.

The Presidency presents the main tasks of the new mandate. The outputs foreseen are two reports on the two main topics:

1- The interdependency between the protective mountain forests and the protected sectors in the field of "freshwater provision" and "flood protection"
2- The contribution of the forest sector to the green economy

The report will be a collection of policies and good practices and eventually recommendations for practitioners and policy makers.

The activity of the WG could address also the financial instruments for rural development (e.g. the implementation of the rural development plan of the EU), the possibility to use the debate among the WG to give inputs for the development of a common strategy for EU forests (at least among the EU Country of the Alpine Conventions).
The other main link identified in the mandate is between the WG activity and the EUSALP Strategy, mainly with the Action Group AG2 "To increase the economic potential of strategic sectors", AG6 "To preserve and valorise natural resources, including water and cultural resources", AG8 "To improve risk management and to better manage climate change, including major natural risks prevention". This is why it is important to have a kind of feedback from the French colleagues, in fact the AG2 - that has the subtopic on forest sector "Wood from Alpine Region" - is coordinating by the by Auvergne-Rhône-Alpes Region.

Discussion:

The AT says that Austria Presidency of the AC is in line with this approach, in particular has already identify as a priority the link between AC and EUSALP. For IT and DE the representatives in the EUSALP AGs are not always the same involved in the WGs of the AC. For Germany there is a close contact between the member of the AC WG and the forest members in the EUSALP. Anyway the Presidency invites the WG members to get in touch with the EUSALP national contacts particularly with the AGs of interest for the WG.

Germany says that the two German Ministries (Agriculture and Environment) in the framework of the AG8 the 23rd-24th October 2017 will organize a conference focused on the topic "flood protection and forests". The proposal from DE is to use the contents of this conference to have a first collection of references and good practices for the first WG report. The Presidency would propose the WG to have a more active contribution within that Conference, this possibility will be checked with the organization. Germany suggests, to have the next meeting of the AC workgroup during the conference in Bad Reichenhall.

Austria gives an overview of the competences of the Austrian Ministry (forests, water and natural hazards). There are several ongoing projects that could be of interest for the WG. It has been mentioned PROLINE, a Central Europe Project on management of forest and drinking water resources as well as protection against floods in an integrated land use management approach. Another one project is CAMARO - Cooperating towards Advanced Management Routines for land use impacts on the water regime in the Danube river basin. This project has developing the idea to transfer the forest development planning into use development planning. The main forest functions addressed are: timber use, prevention, recreation. The national forest plan of AT is in line with the objectives of multifunctionality of forests. The main outputs will be guidelines and selection of best practices in order to give a concrete contribution in the implementation of a sustainable forest management. The project is focused on the Danube area, AT is also part of the EU Danube Strategy and is the only Alpine Country – together with Slovenia – in the Danube Strategy. The Danube and EUSALP Strategy is overlapping for the forests and agriculture sectors, and there is the possibility to share the Alpine experiences also in the Danube area.
The proposal is to have a presentation of the first results of this projects (starting in 2016 and expected to close in the 2019) in the next WGs meeting.

The presidency and the participants agreed that more information regarding these projects will be circulated, together with other projects that the Parties considered relevant for the activity of the WG.

Italy comes back to the outputs foreseen in the mandate: the two reports and the technical conference. The work period left for the WG is about 10 months, is important to define a structure for the report and identify and schedule the intermediate steps.
For the report n.1 on "freshwater provision" and "flood protection" there is the idea to use also the contents of the German Conference. For the report n.2 on forests and green economy Italy gives some inputs. In Italy there are some experiences, one is an interregional agreement among all the Alpine regions

on sustainable forest management and timber products that identify guidelines and common objectives. The next month in Lombardy there will be a fair on timber products and there will be a discussion on the expected results of this agreement.
There is also a Euromontana study on innovation and circular economy in forest sector to be use as reference (Innovation and Circular Economy in the Mountain Forest Supply Chain: How to Close the Loop?)
In addition there is the CLIMO Project - Climate-Smart Forestry in Mountain Regions (COST ongoing project) focused on the forest management that quotes also the Alpine Convention as international organization working in the forest debate. The main tasks of the project are the definition of a smart climate forest and the establishment of a network for the implementation of the Forest Europe criteria. In Italy there is also the National Forest Forum which is a series of workshop addressing the main forest issues dealing with sustainable forest management.

Starting from this first list of projects and documents, the Presidency points out that the reports could be structured in two level of analysis. A first level with information on the state of the art in each Country and a collection of good practices making use of the contents of workshops and projects mentioned. The second level, depending on the efforts of the Parties, could be the elaboration of this information in view of a wider and shared objective such as a project to submit or the elaboration of recommendations and lessons learned to be transferred into operational indications for the Alpine area. For the idea of giving concrete indications it is important also to give information to those, who develop financial programs, so that the criteria to set up and receive funds would be more in line with the real situation in the Alps.

The participants agree with this proposal and decide a timetable as follow:

- by February 2018 – collection of good practices and national information on the topic of the reports as a basis for the discussion
- May 2018 – meeting and discussion on the possibility of drafting guidelines or recommendations

The WG proposed also to launch a kind of call for good practices in order to reach a wider Alpine stakeholders' group that may contribute proposing their good practices developed in the Alps. The idea has to be verified in order to identify the targets to reach with this call and the technical possibility to use an on line consultation or a template to send to the mailing lists of the experts of the WG. The Permanent Secretariat will check the technical issues.

Regarding the Workshops and the Technical Conference mentioned in the mandate, the Presidency recalls the importance to decide on the second WS to be organized (if we can consider the German Conference in October as the first one), taking into account also what the WGs and the *ad hoc* groups of the Alpine Convention has developing. For example, it might be the possibility to organize something in the framework of the WSs of the Alpine Climate Board (ACB) of the Alpine Convention which is developing an action plan for the implementation of the Green economy report (RSA6). The Presidency together with the Secretariat will get in touch with the ACB.

Italy informs that, as already communicated in previous WG emails, the abstract on the report 2016-2017 of the WG has been submitted in the XI National Congress of the SISEF (Italian Society of Silviculture and Forest Ecology) that will be held in Rome the 10th-13th October 2017.
This activity goes in the direction of sharing the work already done and the results achieved in the Alps to a wider public. The participants agree with this approach.

info@alpconv.org

Flood protection and mountain forest
Good-Practice-examples from the Alpine Convention region

Bad Reichenhall 23 October 2017

Dr. Rinaldo Comino
EGTC Euroregio Without Borders

Head of the working group Mountain forests of the Alpine Convention

info@alpconv.org

Index

1. A short presentation of Mountain Forest WG: who we are and what are we doing
2. The state of the Mountain Forests in the Alps
3. The protection function
4. Good practices
5. Conclusions

ALPINE CONVENTION

Permanent Secretariat of the Alpine Convention © 2008 info@alpconv.org www.alpconv.org

WHO ARE THE MEMBERS OF WORKING GROUP ON MOUNTAIN FORESTS

1/5

Name	Organization	Country	Email
Presidency			
Rinaldo Comino	EGTC/Euregio "Senza Confini"	Italy	rinaldo.comino(at)regione.fvg.it
Members			
Josef Fuchs	Land Tirol	Austria	josef.fuchs(at)tirol.gv.at
Martin Höbarth	LKÖ	Austria	m.hoebarth(at)lk-oe.at
Johannes Schima	Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management	Austria	johannes.schima(at)bmlfuw.gv.at
Hubert Siegel	Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management	Austria	Hubert.SIEGEL(at)bmlfuw.gv.at
Claire Morlot	MAAF - DGPE - SDFCB - BGeD	France	claire.morlot(at)agriculture.gouv.fr
Aljoscha Requardt	Federal Ministry of Food and Agriculture	Germany	aljoscha.requardt(at)bmel.bund.de
Stefan Tretter	Bavarian State Institute of Forestry	Germany	stefan.tretter(at)lwf.bayern.de
Enrico Calvo	Regional Agency for Agricultural and Forest Services - ERSAF	Italy	enrico.calvo(at)ersaf.lombardia.it
Davide Pettenella	University of Padua	Italy	davide.pettenella(at)unipd.it
Claudio Ferrari	Autonomous Province of Trento	Italy	claudio.ferrari(at)provincia.tn.it
Maria Teresa Idone	EURAC Research	Italy	idone.minambientest(at)gmail.com
Patrick Insinna	Office of Environment	Liechtenstein	patrick.insinna(at)llv.li
Ana Jurše	Ministry of the Agriculture, Forestry and Food	Slovenia	ana.jurse(at)gov.si
Christoph Dürr	Federal Office for the Environment	Switzerland	christoph.duerr(at)bafu.admin.ch
Simon Beerens-Bettex	AEM		simon.beerens-bettex(at)promonte-aem.net
Primož Skrt	Alpine Space Programme		primoz.skrt(at)alpine-space.eu
Zoanetti Roberto	Arge Alp		roberto.zoanetti(at)provincia.tn.it
Sara Verones	Arge Alp		sara.verones(at)provincia.tn.it
Karin Enzenhofer	WWF		karin.enzenhofer(at)wwf.at
Giulia Gaggia	Permanent Secretariat of the Alpine Convention		giulia.gaggia(at)alpconv.org

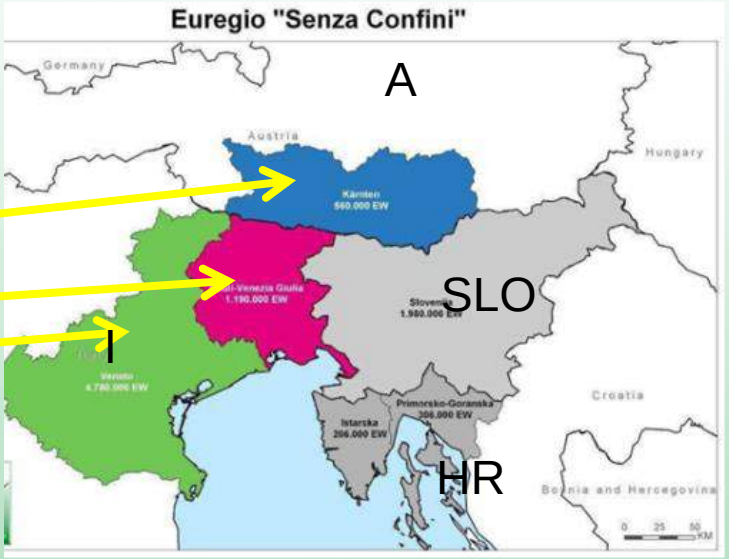
The Presidency of this WG and the EGTC Euroregio Without Borders what is the and its cooperation with Alpine Convention

REGIONE DEL VENETO LAND KÄRNTEN REGIONE AUTONOMA FRIULI VENEZIA GIULIA

At first EGTC stays for European Group for Territorial Cooperation. In particular the "EGTC Euroregio Without Borders", the constituent document of which was signed on 27 November 2012, consists of the following founding members:

- Land Carinthia (A)
- Friuli Venezia Giulia Autonomous Region (I)
- Veneto Region (I)

This EGCT was established in order to facilitate and promote cross-border, transnational and interregional cooperation between its members for the strengthening of no profit economic and social cohesion.



It remains open to potential new members. At present it is being applied to join the Istrian County (HR). It represents an area of about 35.800 square kilometers in which live about 6.8 million inhabitants.

The presidency of the WG on Mountain Forests is expression of this organization for the period 2017-2018

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

Mountain Forest WG: WHAT ARE WE DOING

- In cooperation with other Working Groups and Platforms, this WG helps to keep the Alpine biodiversity and to protection it from the effects of climate change.

- Mountain forests are a distinguishing element of the alpine landscape and have an important recreational function, therefore the Working Group is also active in the field of tourism, especially by the collection of good practices for evaluation of the forests through sustainable forest tourism and other activities, that contribute to the development of green economy in the Alpine arc.

- During this period 2017-2018, on the basis of the results achieved in the years 2015-2016, the mandate and the activities of the Working Group focuses on the protective function of the Alpine Mountain Forests; on activities for the recognition and valorization of the ecosystem services in the Alpine forests.

- In particular, the WG is collecting policies and good practices related to the role that Alpine forests play toward a low carbon, sustainable and social inclusive economy for the Alpine area, considering wood, energy and non-wood products and describing interdependencies between the protective mountain forests and the protected sectors in the fields of “freshwater provision” and “flood protection”.

info@alpconv.org

The cooperation with EUSALP and its Action Groups

- Action Group 2 “To increase the economic potential of strategic sectors” aimed at, among other, promoting agriculture and sustainable forestry sector based products and services, labeling Alpine wood and non-wood products, energy.
- Action Group 6 “To preserve and valorize natural resources, including water and cultural resources” containing specific focus on forests.
- Action Group 8 “To improve risk management and to better manage climate change, including major natural risks prevention”, which is interested in a close contact to forests.

info@alpconv.org

The cooperation with EUSALP and its Action Groups

For example:

- within the AG2, Mountain Forests WG could contribute to the discussion on the alpine timber, also in a logic of promoting short chains and cluster initiatives, in a general framework for reduction of C02 emissions
- within the AG6 - sub-topic 2 “Future oriented farming and forestry”, Mountain Forests WG could contribute to the activities foreseen for the promotion and marketing of food and forest products especially in urban areas, which are sustainably produced and processed in the EUSALP mountain and rural areas to maintain cultural and ecosystem services.

 info@alpconv.org

Now we start

The protection function in the mountain forests of the Alps

SISEF
XI CONGRESSO NAZIONALE

This presentation originates from a large document illustrated by our WG at the SISEF congress (Italian Forestry and Forestry Ecology Society), held the 12 October in Rome

It is also based on the Report of the Mountain Forests Working Group of the Alps Convention

Schima J. (A), Fuchs J. (A), Huber T.(D), Tretter S. (D), Duerr C. (CH), Calvo E. (I), Della Giacoma F. (I), Comino R. (I), Pettenella D.(I), Favilli F. (I), Idone MT.(I), Gaggia G. (CA)

2/5

The state of the Mountain Forests in the Alps

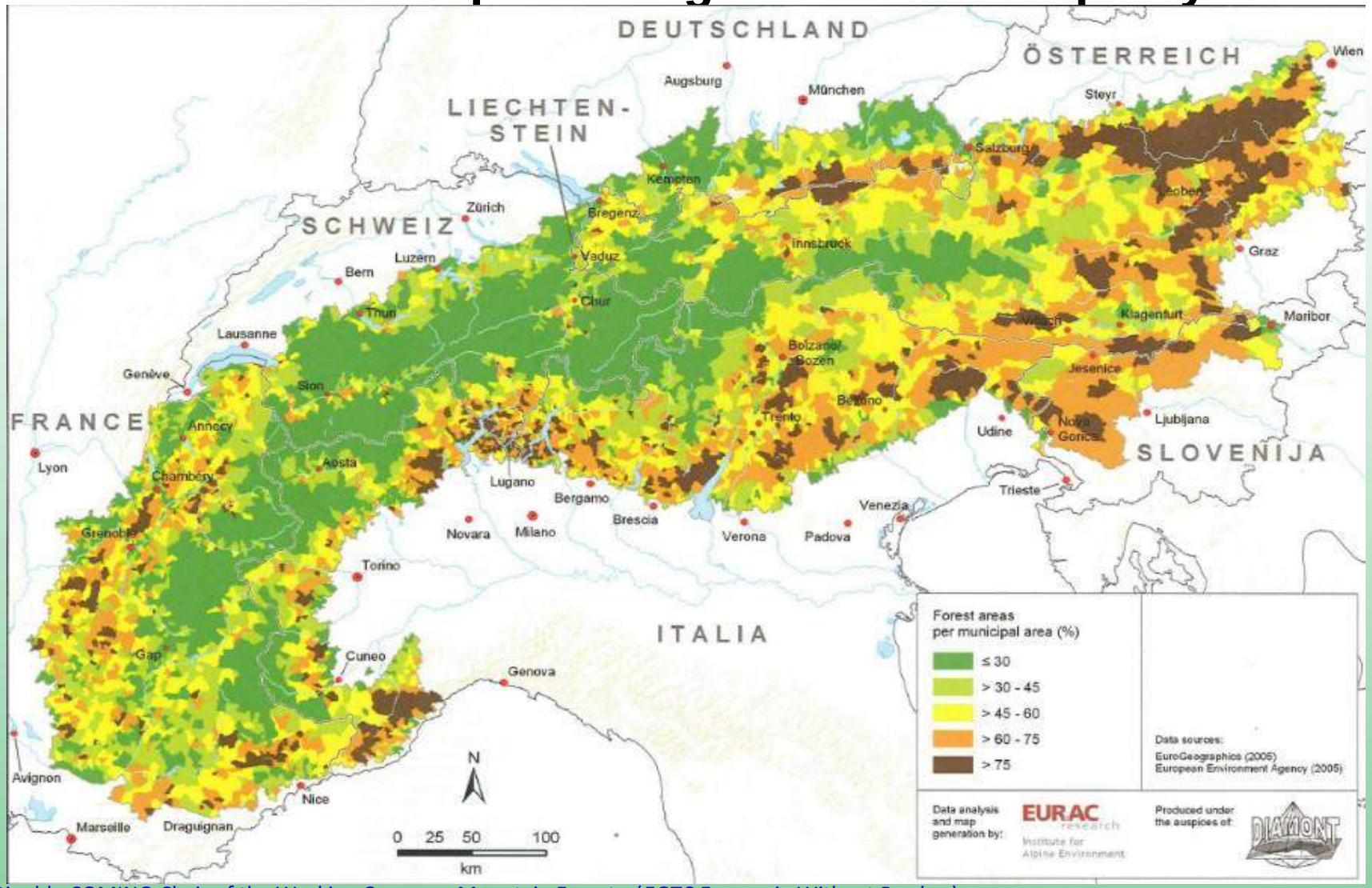
Forest areas in the territory of the Alpine Convention

Comparison of forest cover data from satellite images Corine Land Cover 2006 EEA (EURAC 2013) and from national inventories

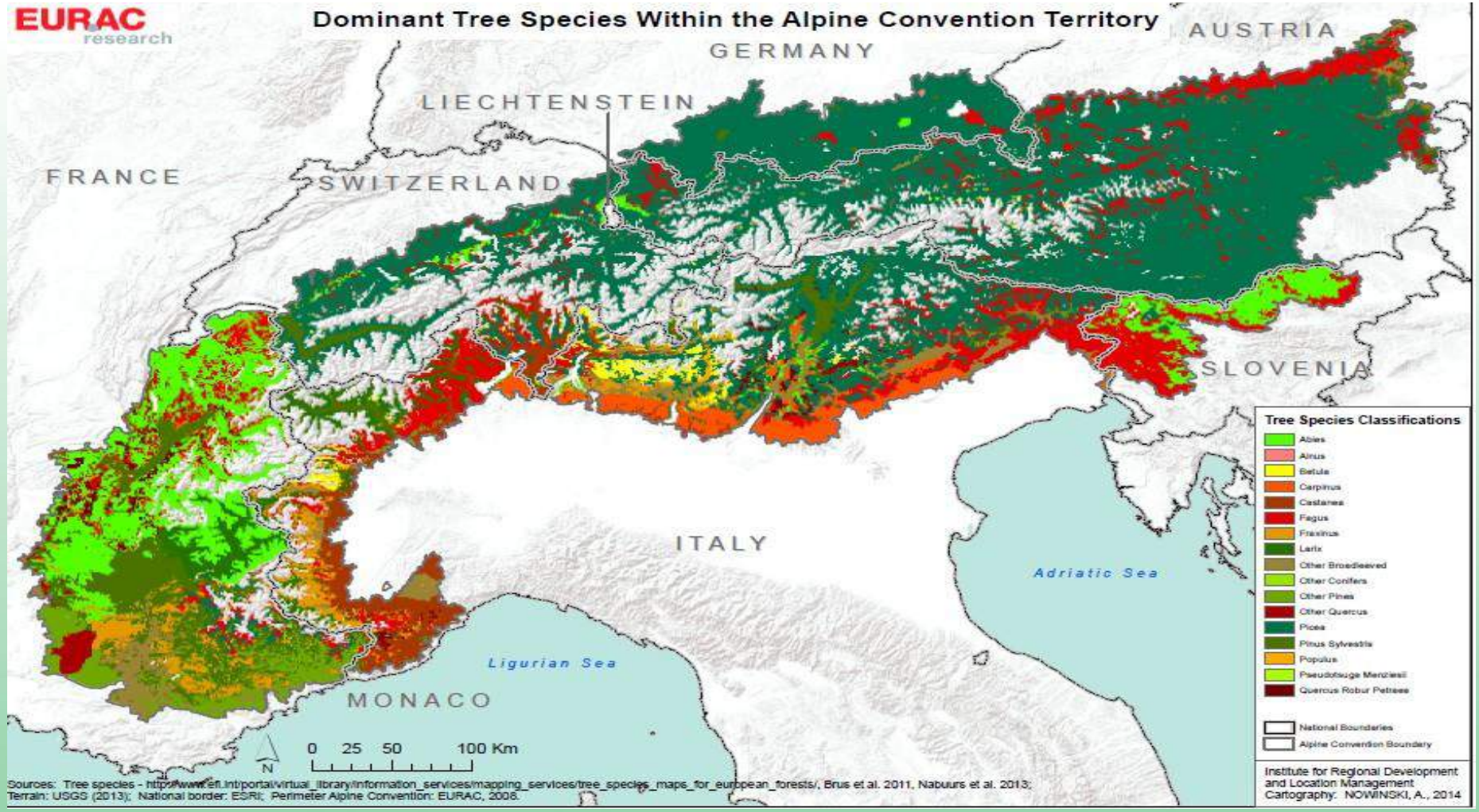
	Unit	CH	I	D	F	A	FL	Slo	Tot
Forest area (CLC, 2006)	km²	7,506.8	25,072.0	4,468.2	16,526.0	28,813.7	73.7	4,539.3	**86,999**
Alpine Convention territory	km²	24,862.0	52,033.8	11,054.8	40,788.4	54,702.2	160.0	6,671.0	**190,272**
% Forest	%	30.2%	48.2%	40.4%	40.5%	52.7%	46.1%	68.0%	**45.7%**
national inventory	100 ha	8,000.0	28,000.0	4,756.0	14,690.0	25,826.0	51.72	4,853.5	**88,277**
Difference	100 ha	593.2	2,928.0	287.8	-1836.0	-2,987,7	-22.0	314.2	**1,277**
difference %		7.9%	11.7%	6.4%	-11.0%	-10.4%	-29.8%	6.9%	**1.5%**

info@alpconv.org

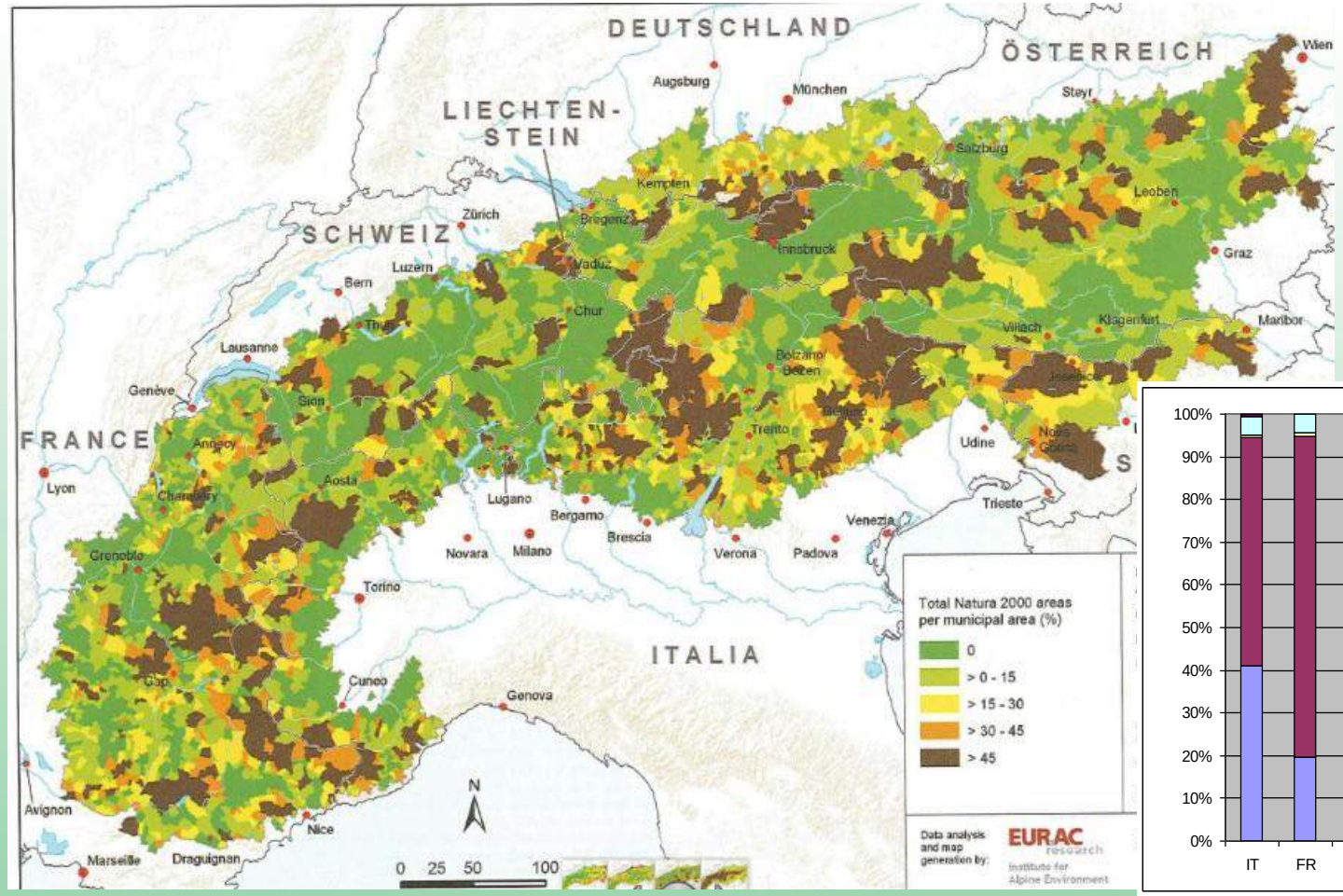
Forest area as a percentage of the municipality

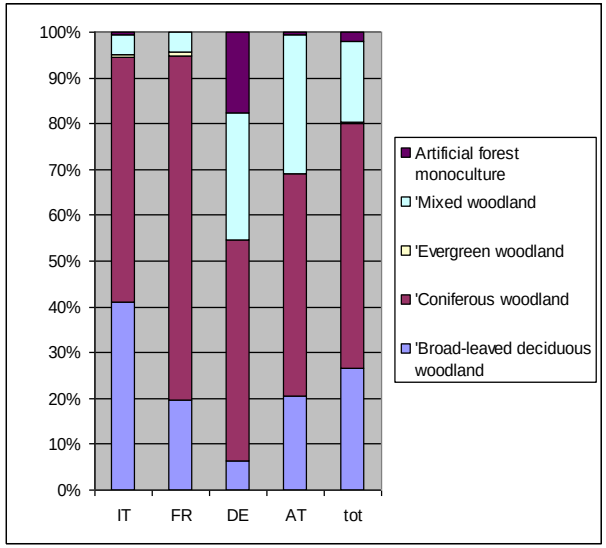


Different types of tree species



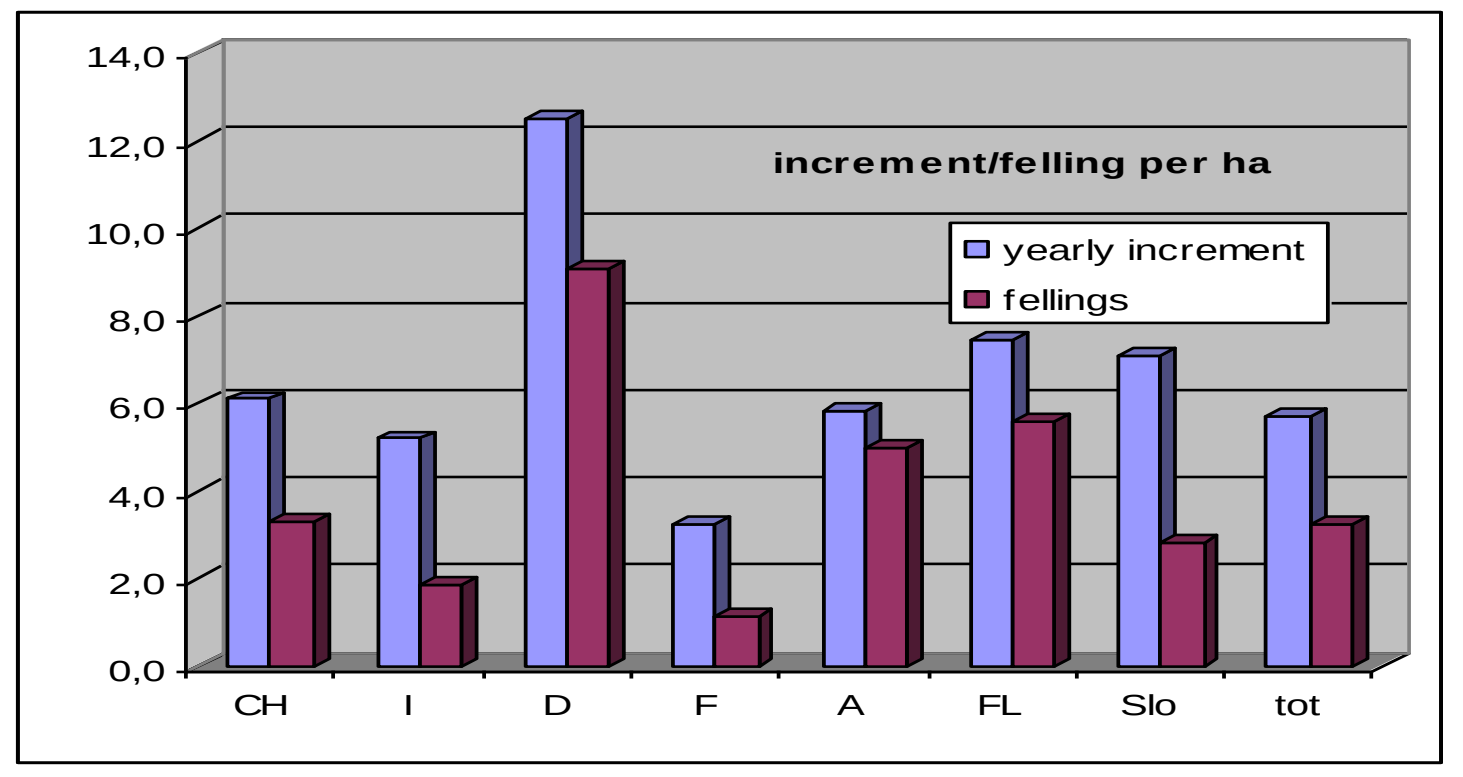
Percentage of municipality land in Natura 2000





info@alpconv.org

Annual growth and felling in the Alpine forests



info@alpconv.org

3/5 The protection function

Protective forests in the Alps: some synthesis data

 info@alpconv.org

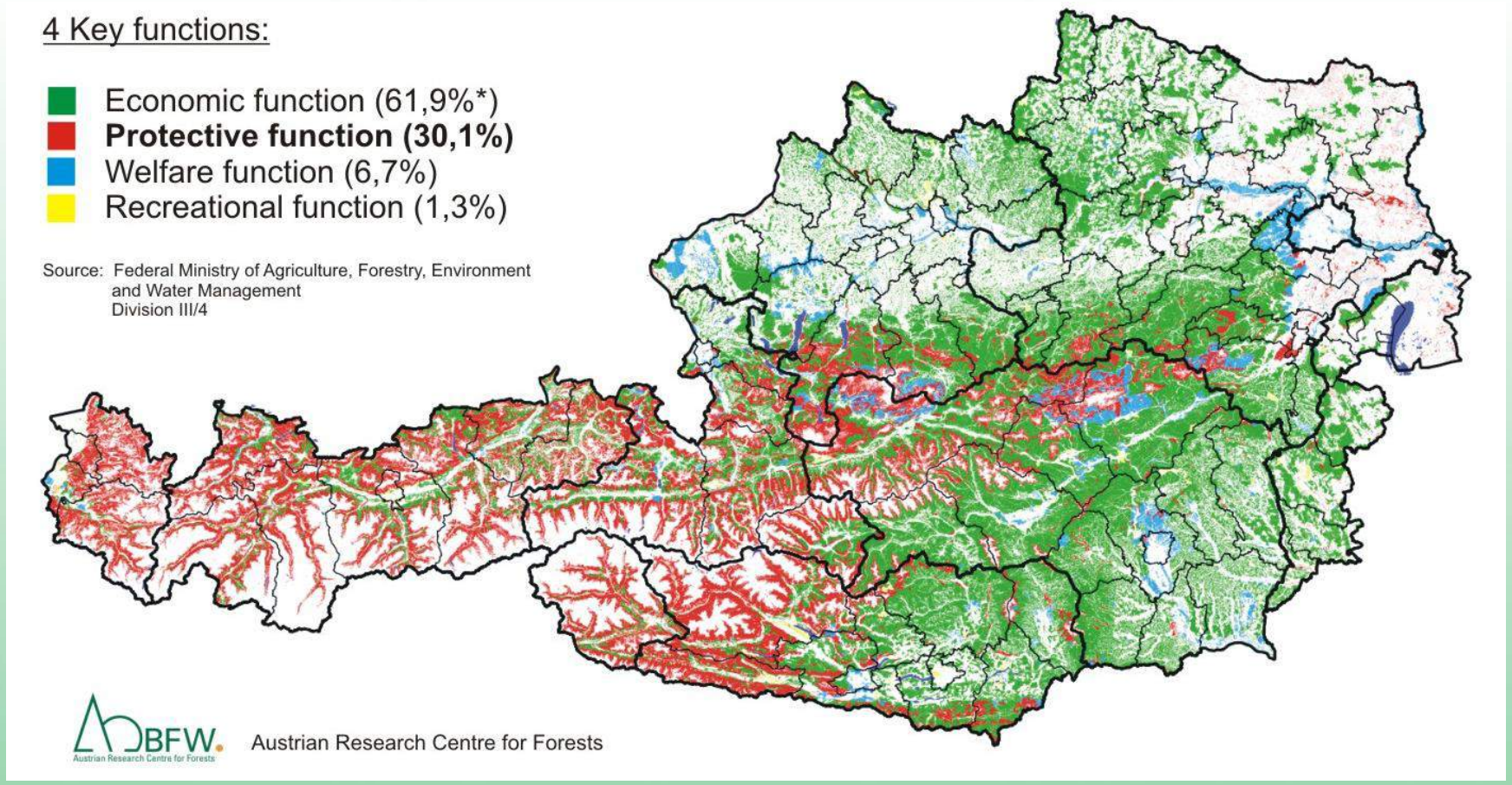
The protective forests in the Alps some synthesis data

	CH	I	D	F	A	FL	Slo	Tot
hectares (x1000)	392	812	276	136	801	-	-	2.417
%	49	29	58	10	31	-	-	30
(subsidies) €/ha/y	155	62	17	24	8	-	-	52

and in particular:

info@alpconv.org

AUSTRIA



info@alpconv.org

AUSTRIA

Forest Act identifies 2 functions

- site protection: forests on sand and drift soils, threaten by erosion or landslides, on sites where regeneration is very difficult (forests towards timberline, poor soils)

- object protection: humans, settlement, facilities, cultivated soils against natural hazards

- 283 m^3/ha does not differ much from the average for all forests (286 m^3/ha).

Only the amount of timber harvested averagely in protective forests per year differs with 3.8 m^3/ha significantly from the average for all forests: 5,0 m^3/ha

info@alpconv.org

GERMANY

Total forested area of Bavaria: 2.500.000 ha;
mountain forests are approximately 10% of the total forested area: 250.000 ha;
protection forests are 58% of the mountain forests: 145.000 ha.

Legal definition of protective forests (Bavarian Forest Act):

- located at higher elevation or mountain ranges or
- site with erosion risk or with prevention of natural hazards as avalanches, rock fall, floods etc.

info@alpconv.org

GERMANY

There is a **financial support** for **private** and **communal owners** of mountain forests with a special focus on for maintaining the protective functions.
Annual subsidies are about 2.9 M €/year (for road-building, logging with cable cranes, planting of deciduous and mixed stands, establishing natural regeneration, tending in young stands, prevention of bark beetles).

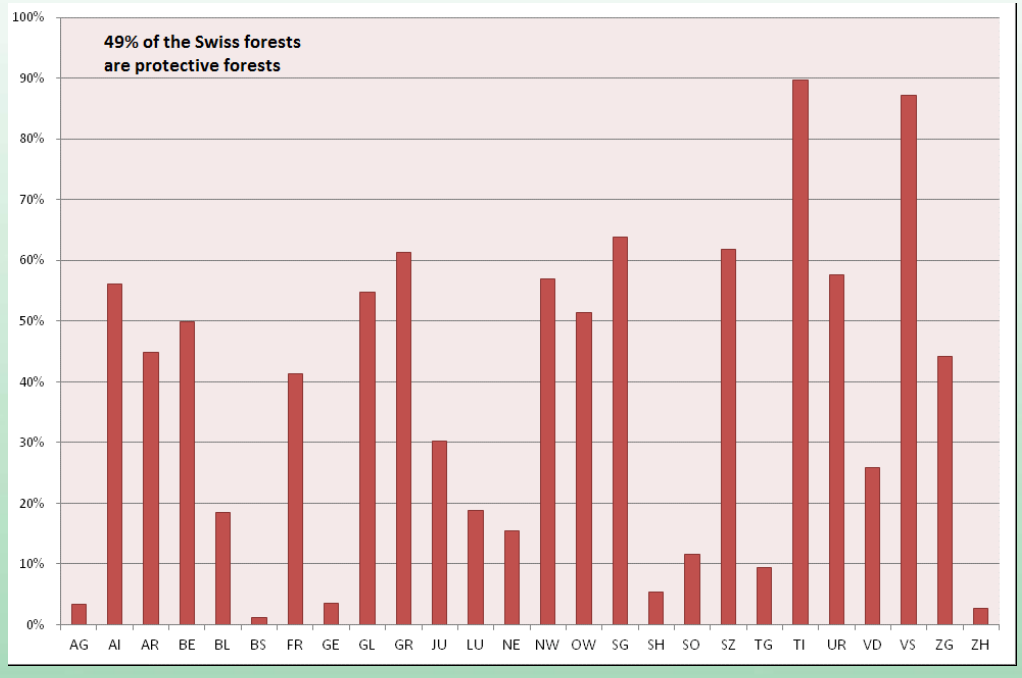
Since 2005 the **national forests** can also benefit of subsidies for special measures in protective forests (road building, prevention of bark beetles, planting, tending in young stands) too.
This regulation was also integrated in the Bavarian forest law. The annual subsidies are about 1,8 M €/year.

info@alpconv.org

SWITZERLAND

Forest with a direct protection function has been defined in the whole Switzerland and is 49%.

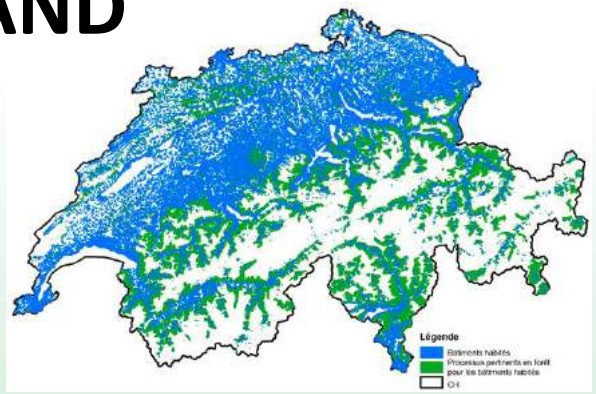
The percentage of forest related to each cause is:
- 8% rockfall
- 21% avelaches
- 27% landslides
- 80% torrential processes



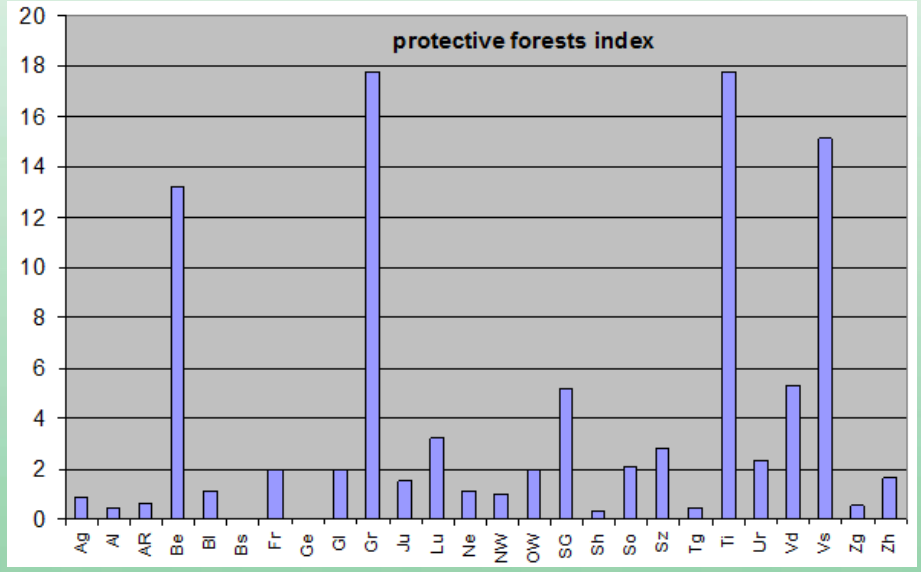
info@alpconv.org

SWITZERLAND

On the basis of national criteria, the area relevant for each hazard's source has been defined for whole Switzerland:.



The percentage of this area for each canton is protective forests index. This is higher in the Alpine core area (Graubuenden, Ticino, Vallaise, Berner).



The index is the base for provision of subsidies for protective forest management to the cantons (60 Mill CHF/year).
Additional 40 M. CHF are provided for techincal protective measures on the basis of risk potential and needs.

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

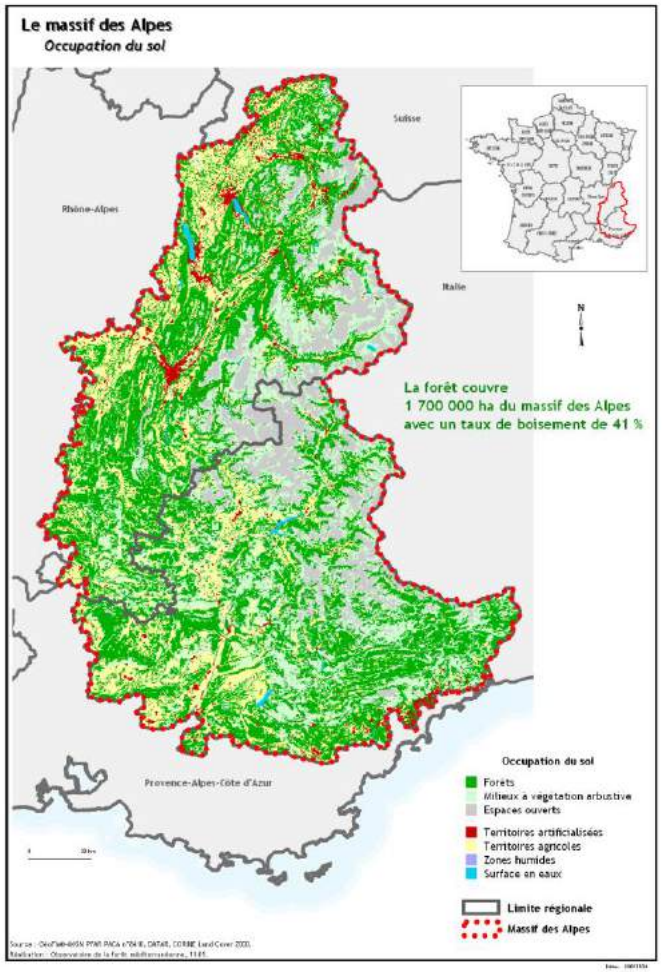
FRANCE

In the French Alps (total forest area: 1.446.000 ha) direct protective forests are 136.100 ha (9,4%).

A study in 3 small alpine catchments showed that the direct protection area varies between 20 and 47% of the forest area.

200.000 ha forest are in drinking water reservoir protection zones (within landscapes with special conservation regulations) (1,3% of the forest area); 600.000 ha within mineral water spring protection zones (where no special forestry requirements are in place) (3,9% of the forest area).

RTM (Restauration des terraines en montagne) manages 205.000 ha in the French Alps and has a yearly budget of 5 M €.



dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

ITALY

	ha	%
Forests subject to hydrogeological restriction	2.670.630	88,6%
Forests with inclination > 40%:	1.742.838	63,1%
Forests with altitude > 1.500 m	721.836	21%
Forests with instability phenomena	537.709	17,9%

info@alpconv.org

ITALY

REGION (from the west to the east side of Italian Alps)	Forests subject to hydrogeological restriction	Forests with inclination > 40%	Forests with instability phenomena	Forests with altitude > 1.500 m
Piemonte	83,9%	57,2%	19,4%	11,9%
Valle d'Aosta	80,8%	76,0%	24,8%	59,4%
Lombardia	82,9%	65,4%	14,6%	13,0%
Alto Adige	98,1%	70,9%	21,9%	42,9%
Trentino	98,7%	67,8%	14,1%	
Veneto	95,3%	60,4%	19,5%	16,6%
Friuli V.G.	85,7%	60,3%	15,9%	6,0%
TOTALE	88,6%	63,1%	17,9%	21,0%

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

ITALY

Most Italian alpine woods, always over 80% of the surface, are subject to restrictions for hydrogeological protection in order to best fulfill the protective function.

The predominantly or exclusively protective function fluctuates between 15% and 55% depending on the Region

For the period of the last Rural Development Plan 2007-2013, an average of 23€/ha was invested for forests in Piedmont, 31€/ha for forests in Lombardy, 112 €/ha for Veneto and 141 €/ha for the province of Bolzano.

info@alpconv.org

4/5 EXAMPLES AND GOOD PRACTICES

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

1 - Interreg III A 2000-2006, project “Sustainable management of mountain forests”

During the period 2003-2006, the project made it possible to develop and disseminate technical tools to optimize forestry, particularly with regard to the protection against natural hazards (Guide to mountain forestry).

La forêt nous protège
Interreg
FRANCE-SUISSE
FORETS DE PROTECTION

2 – Project Interreg IIIC “Network Mountain Forest”:

http://www.provincia.bz.it/foreste/studi-progetti/rete-nmf.asp

North EAST South West
INTERREG IIIC

Purposes:
the objective of this Interreg IIIC project is to promote an adequate forest policy for the whole Alpine arena, which on the one hand provides for forms of incentives and measures for the mountain forest and, on the other, enhanced its exploitation in the European area.

info@alpconv.org

3 - NESBA - Progetto Interreg IV Italy– Austria:
http://www.provincia.bz.it/foreste/studi-progetti/2557.asp

The project collected the experiences of the sustainable and integrated development of the protection forest and the economy of mountain pastures and mountain tourism. Concrete projects were carried out and surveys and studies on biomass supply were made

 info@alpconv.org

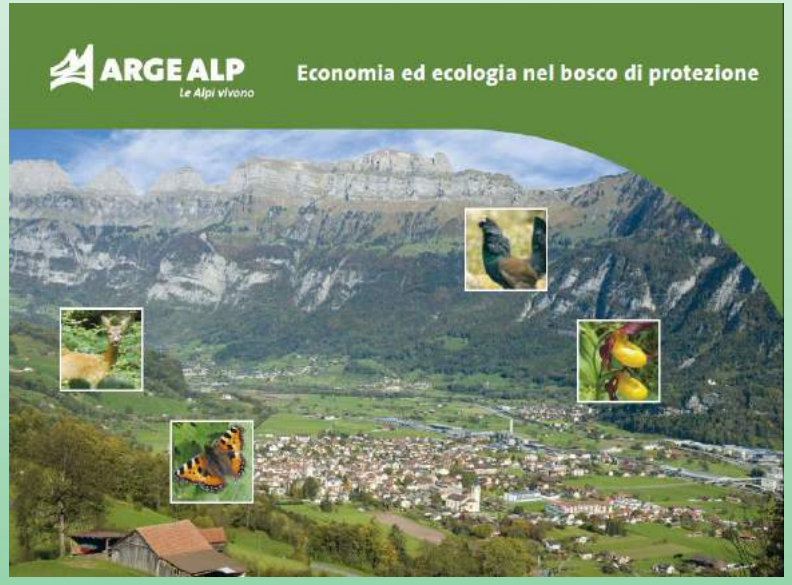
4 - Project Arge-Alp "Economy and ecology in the protection forest" :
http://it.argealp.org/main/progetti/economia-ed-ecologia-nel-bosco-di-protezione

ARGE ALP
Le Alpi vivono

Baviera Grigioni Lombardia Salisburgo San Gallo Alto Adige Ticino Tirolo Trentino Vorarlberg

The project has highlighted that protecting the forests is a key element in ensuring the lives and safety of the Alpine valleys.

Between economy and ecology there is no contradiction. Sustainable forest care takes into account both elements in equal measure.

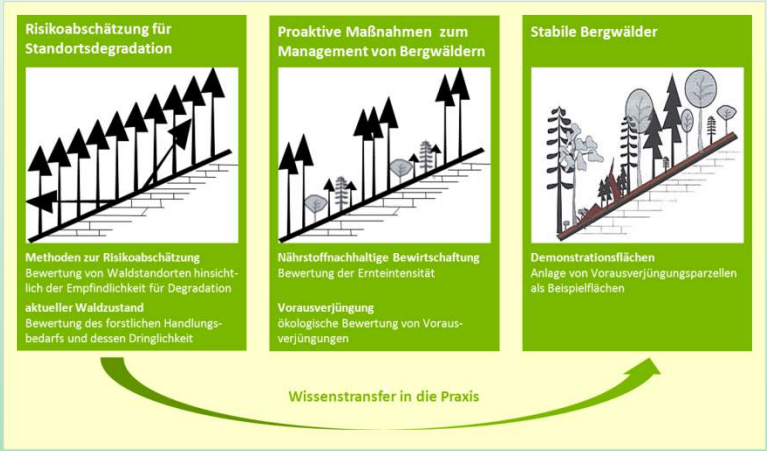


5 - Project StratALP Strategies for the stabilization of forests in the Limestone Alps - Interreg Bavaria – Austria 2007-2013

https://www.hswt.de/forschung/forschungsprojekte/wald-und-forstwirtschaft/stratalp.html

The project has shown that, after wide windstorm and beetle disasters in protected forests on shallow soils of the Northern Limestone Alps, will cause serious humus losses and also problems for natural and artificial rejuvenation on these areas .

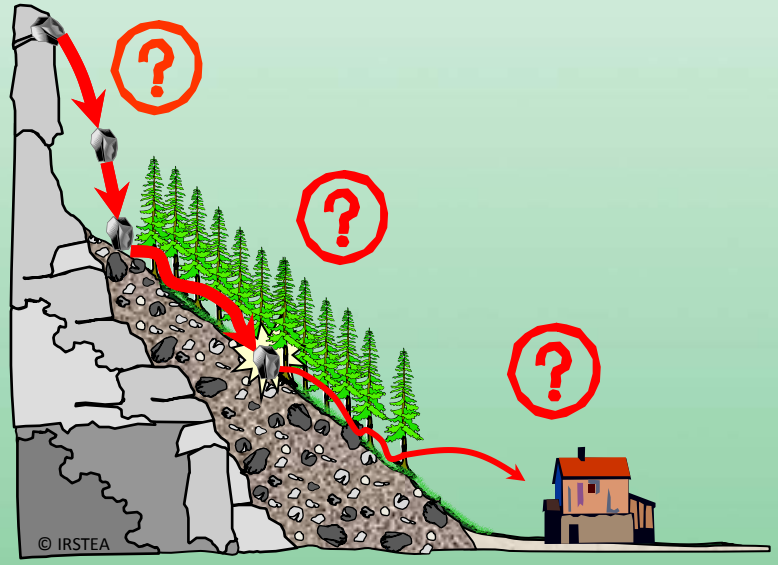
Proactive measures for the management of mountain forests in the Limestone Alps are also investigated and proposed

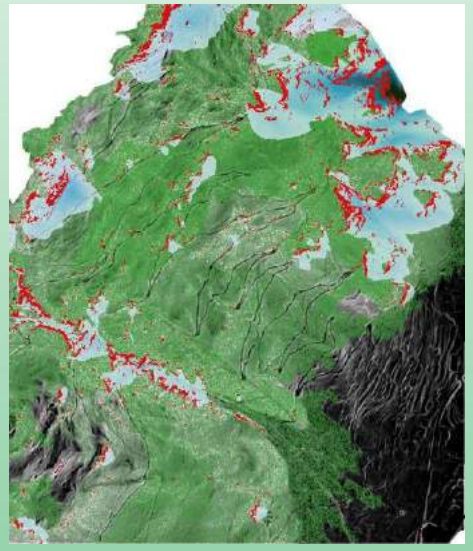


6 - Project Rock the Alps - Interreg Alpine Space

Concerning harmonization rock fall, natural risk and protection forest mapping in the alpine space

FROM MODELLING ⟹ TO MAPPING





D T M

SOURCE AREA

ROCKFALL ENDANGERED AREA

PROTECTION FORESTS

RISK REDUCTION

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

7 - LIFE Project Making Good Natura http://www.lifemgn-serviziecosistemici.eu

life+mgn making good natura

Ecosystems services payments in Nature area network 2000, with the definition of specific payments for protective forests focusing on preventing erosion and hydrological disasters

ECOSYSTEM SERVICE	European Community important sites in Italian Alps	FOREST AREA ha	€
protection against erosion and hydrogeological deterioration	Valvestino (BS)	5.841	2.886.636
	Val Masino-Val di Mello (SO)	1.804	150.000/850.00
protection from hydrogeological disasters (floods) through Full flow control	Sasso Malascarpa (CO)	137	3.167.788

8 - The mountain forest offensive

http://www.bergwald-offensive.de/

„WIR MÜSSEN HEUTE BEGINNEN – DIE ERGEBNISSE WIRD MAN ERST IN VIELEN JAHREN SEHEN."

ANTON KLOTZ, OBERALLGÄUER LANDRAT

we have to start today, the results will only be seen in many years

BERGWALD OFFENSIVE

Within the framework of the **mountain forest offensive**, the measures for the stabilization and sustainable adaptation of the mountain forests to climate change are therefore intensified and implemented in accordance with the objectives of the Alpine Convention.

Where these urgent measures are not cost-effective, forest owners need financial assistance.

This is a program for sanitation of the protective forests. The program is under direct responsibility of the Bavarian Forest administration. The annual investment is about 2,8 Mill. €/year.

info@alpconv.org

8 - The mountain forest offensive

The Project Committee "Bergwaldforum" – "Mountain Forest Forum"

The work of the "round table" is crucial for success within the community of the project.

Here are discussed and completed forest planning measures with representatives of forest owners, hunters, alpine farmers, associations of nature conservation, municipalities, tourism operators and specialized authorities. Consequently, a mutually agreed agreement is reached on the further development of local mountain forests.

info@alpconv.org

9 – Project Silva Protect - CH

https://www.bafu.admin.ch/bafu/it/home/temi/pericoli-naturali/info-specialisti/pericoli-naturali-e-utilizzazione-del-territorio/documentazione-sui-pericoli/silvaprotect-ch.html

Aims:

- the development of a method for delimiting the forest of protection;
- making available a resource-sharing tool;
- information on areas where the protected forest protects against certain hazardous processes;
- the determination of the percentage of protection forest that protects certain types of objects, threatened by natural hazards (so-called categories of damage potential for example roads or buildings)

info@alpconv.org

10 – Project “Training trails for protection forests”

http://www.bosco-protezione-uomo.ch/it/index.shtml

Forest of protection = damage prevention

The project on educational paths is funded financially by the pool to cover the damage caused by natural elements, an alliance of 22 Swiss insurance companies. It is a unique solidarity work in the world in favor of populations threatened by natural-related risks. The planning and implementation of the trails are carried out by the organization for environmental education SILVIVA, with the collaboration of representatives of cantonal forestry inspectorates, federal forest management and the Swiss forestry association

ASA | SVV
Schweizerischer Versicherungsverband
Association Suisse d'Assurances
Associazione Svizzera d'Assicurazioni
Pool danni naturali

GIBP
Pericoli naturali – Bosco – Uomo

silVIVA
PER L'EDUCAZIONE AMBIENTALE ED IL BOSCO

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

10 – Project “Training trails for protection forests”

It is necessary to carry out this task of responsibility and to point out to the new generations the significance of the forest as a means of protection from the forces of nature.

This is the purpose of the 10 forestry forestry pathways where natural disasters are lurking - like falls of rocks, full of debris, landslides or avalanches - and their destructive force is visible at least in part.

It is necessary to show convincingly the function of the woodland heritage.

The wood educational paths are found in the SWITEZERLAND mountain regions and represent eight exemplary possibilities to experience, in an unusual and persuasive way, the value of nature as a vital basis for man.

Today more than 70% of the Swiss resident live in urban areas. The project want to send everyone an invitation to explore a world unknown to most people, but to whom we owe much to the quality of our lives and our security

info@alpconv.org

11 - Swiss Group for Mountain Forestry (GSM)

the Swiss Group for Mountain Forestry (GSM) is a network of expertise for issues that concern it.
Its members can draw on extensive professional experience, take advantage of the dialogue with their colleagues during drill exercises and are able to apply knowledge gained in their field of activity or in the daily life.
Several members are asked, in their capacity as experts, to join working groups. The Federal Office for the Environment (FOEN), the Swiss Forestry Society (SFS) and the forestry training centers almost obviously involve GSM in mountain forest issues or interrogate it in consultation procedures

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

11 - Swiss Group for Mountain Forestry (GSM)

Meanwhile other issues have emerged which GSM will have to deal with over the next few years:

- climate change and its impact on the mountain forest
- the modification of forestry strategies as a result of the improvement of the wood market and the adoption of maximum admissible intervention limits
- the impact of intervention limits on forest protection on forest development and the costs of harvesting timber
- the adoption of minimum standards for naturalistic forestry, in particular the adoption of minimum standards based on NaiS (Sustainability and success monitoring in the protection forest)
- forestry planning and sustainability control

 info@alpconv.org

5/5 CONCLUSIONS

Lack of a common definition at National level

Lack of a common definition from the regions for the Alpine arc

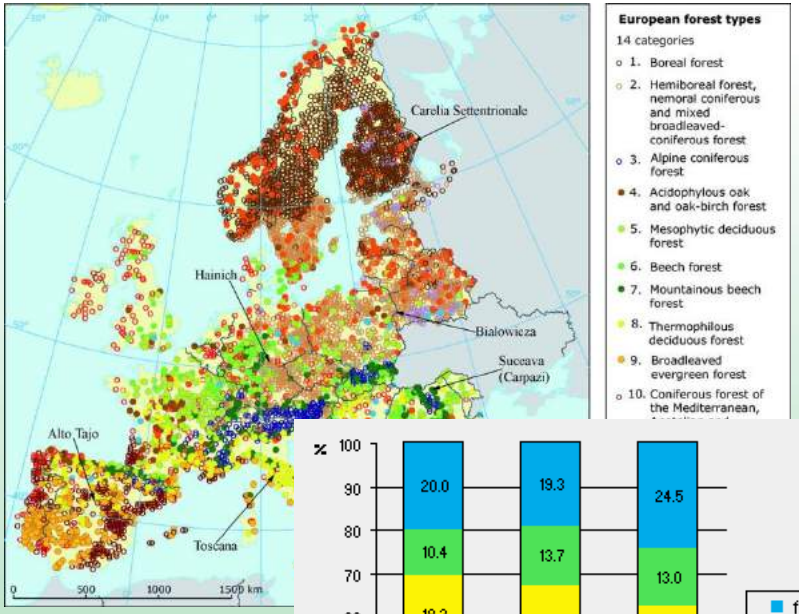
Lack of planning data

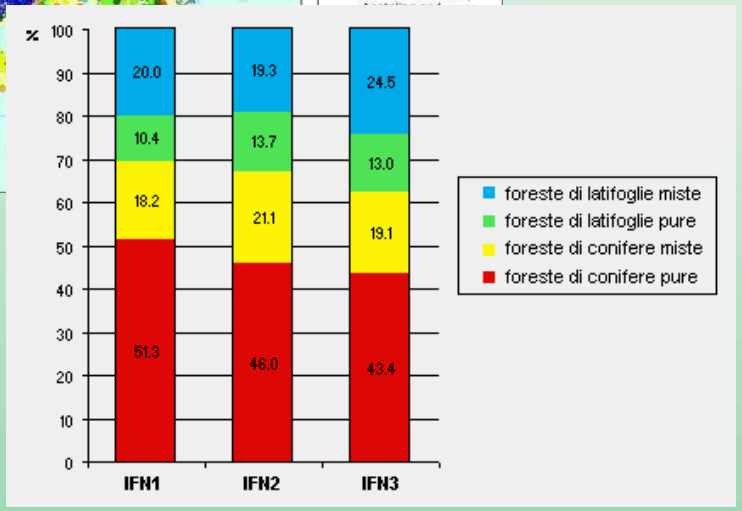
Significant interest from the forest world

Insufficient interest from the political world and from society

State of neglect and aging of vegetation

info@alpconv.org

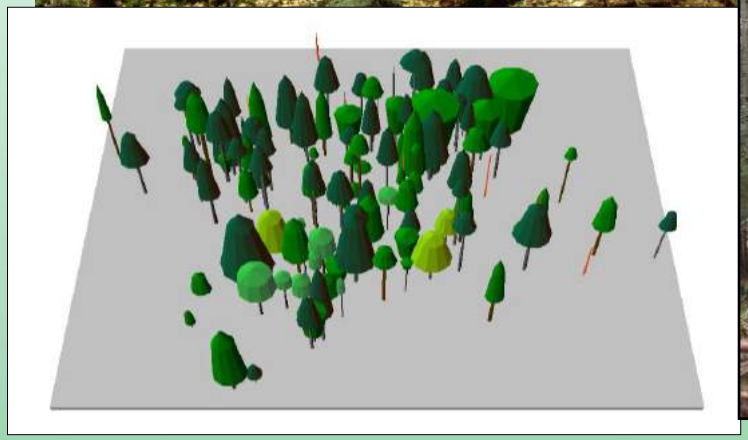




1. Improving and sharing information and data from national forest inventories on the state of forests (evolution, dynamic, use, damages, services, ecc.)

info@alpconv.org

2. Establishing Natural Forestry Reserves, to preserve old forestry stands, in a longer period of natural undisturbed evolution for conservation, research and educational purpose



info@alpconv.org

3. Exchanging information and data on forest management of protective forests: experiences, good practices

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

4. Supporting and strengthening research on ecosystem services granted by alpine forests and releasing good practices of PES

info@alpconv.org

5. Creating awareness concerning the value of the alpine forests and their goods and services for the whole society

info@alpconv.org

Fusine (Udine)
Region Friuli Venezia Giulia, Italy
920 m s.l.m. - Winter 2008 - 2009

Always working together in agreement with stakeholders in the forestry and wood sectors: the common goal remains the forest protection and its appreciation

Thank you for your attention

dott. Rinaldo COMINO
Chair of the Working Group on Mountain Forests
(*EGTC Euroregio Without Borders*)

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

italian delegation
alpine convention

alpenkonvention • convention alpine
convenzione delle alpi • alpska konvencija

Meeting of the MOUNTAIN FORESTS Working Group

24 October 2017

Bad Reichenhall
Königliches Kurhaus,

Presidency: Rinaldo Comino, Maria Teresa Idone

Delagations:

Italy - Enrico Calvo, Francesco Dellagiacoma, Graziano Martini Barzolai

Austria - Hubert Siegel

Germany - Stefan Tretter

Slovenia - Grega Voglar, Milan Kobal

Observers: Arge Alp - Roberto Zoanetti

PSAC: Giulia Gaggia

The chair announced that the Swiss delegation had informed him of his inability to attend this meeting.

The Members of the Working Group approved the Minutes of the first meeting held in Tolmezzo (April 2017).

The German Delegation proposed a draft structure of the reports that the WG has to elaborate on the basis of its Mandate:

- I° Paper: Interdependencies between mountain forests and flood protection;
- II° Paper: Interdependencies between mountain forests and freshwater provision.

The Italian Delegation collected some best practices regarding the main topics (freshwater provision and flood protection) and presented the 3 Italian case studies:

1. Royal decree 3267/1923;
2. protection of water supply areas: Plans elaborated by the Province of Trento and Bergamo;
3. "Protection Forest" project in south Tyrol.

Italy proposed to translate the document as a “Manifesto” containing the values of the protected forests, defining some concrete commitments to be taken by Countries and to submit to the territories and the local populations. Furthermore, proposed to elaborate a template to collect the good practices: one template to describe the state of the art in the alpine countries, including the regulatory aspects, data and information on the protected forests and a second template for the best practices.

The Austrian Delegation presented, as good practice, the PROLINE-CE Project (Central Europe Programme) that covers the question of drinking water and flood protection.

By mid-February the WG decided to elaborate a first draft of these two reports. Afterwards the WG can verify the necessity to have a summary version of the Reports and a brochure (in the 4 alpine languages + EN) addressed to the population and general public. As for the previous Mandates the WG would like also to submit a Declaration to the Alpine Conference. The members decided that all the printed materials should be printed on certified paper for sustainable forest management.

This approach will be valid also for the second report (Report for the PC, Declaration for the Ministers, brochure for the general public and population).

The members decided the structure/index for both Reports (see document attached). Comments/suggestion should be sent to the Chair by the end of November.

It is also necessary to have a referent for each report, so that this person can receive/collect the contributions and draft the Report. Italy (Enrico Calvo) can manage the contributions for the first Report on Interdependencies between mountain forests and freshwater provision and asked the Delegations to send him the written contributions in English in order to put these together. He will also get in contact with the other Delegations.

Concerning the second Report Interdependencies between mountain forests and flood protection Germany (Stefan Tretter) is responsible for Chapters 1 and 2 while Italy (Francesco Dellagiacoma) for Chapters 3 and 4.

With the sending of the Minutes, the Members will also receive the templates for the collection of the good practices. Also on that, comments and suggestions should be sent within at most 25 November 2017.

The Chair asked to verify if there are some interrelationships with the other WGs/PFs and the AG of EUSALP avoiding to have duplication/overlapping. The Chair will also get in contact with the Platform of Planalp in order to check with them how the thematic of the forests protection is described in the new RSA. Furthermore, the Chair asked the PSAC to have more information about the board on green economy and check if it’s possible organize a WS on the topic forest & green economy.

About green economy, the chair refers that Christoph Dürr of the Swiss delegation wrote to our working group pointing out that there are two recent publications of UNECE/FAO, which might be of our interest: “Rovaniemi Action Plan for the Forest Sector in a Green Economy” and “The Value of Forests: Payments for Ecosystem Services in a Green Economy” and to get more information we can take contact with the UNECE/FAO forest and timber section, Mrs. Paola Deda.

MINISTERO DELL'AMBIENTE
E DELLA TUTELA DEL TERRITORIO E DEL MARE

italian delegation
alpine convention

alpenkonvention • convention alpine
convenzione delle alpi • alpska konvencija

3° meeting of the Mountain Forests Working Group

Santo Stefano di Cadore (BL)

28 June 2018

Minutes

Presidency: Rinaldo Comino, Maria Teresa Idone

Members:

Austria:	Hubert Siegel, Michael Prskawetz
Italy:	Enrico Calvo, Davide Pettenella, Francesco Dellagiacoma
French:	Jean-Pierre Chomienne
Slovenia:	Grega Voglar, Milan Kobal
Arge Alp:	Roberto Zoanetti
P.S.A.C.:	Giulia Gaggia

At 15.30 the president start the meeting by thanking all the participants, especially those who come from far, beginning with the newly appointed French delegate Jean-Pierre Chomienne, the Austrian colleague Michael Prskawetz of the Austrian Federal Ministry of agriculture and forest, environment and Water management that accompanies Hubert Siegel that will soon retire, and Slovenian colleagues Grega Voglar and Milan Kobal that are representing the Slovenian delegation.

The president reads the items on the agenda as listed in the invitation:

1. communications from the chairman and approval of the minutes of the meeting of Bad Reichenhall
2. discussion on and evaluation of the elaborations concerning the first of the two reports of the mandate 2017-2018: The interdependency between the protective mountain forests and the protected sectors in the field of "freshwater provision" and "flood protection
    a. Paper 1: Interdependencies between mountain forests and flood protection (Stefan Tretter/Francesco Della Giacoma)
    b. Paper 2: Interdipendence between mountain forests and freshwater provision (Enrico Calvo)
    coffee break
3. Planning for upcoming meetings and activities
4. Discussion on the second report of the mandate 2018-2019 "The contribution of the forest sector to the green economy"
5. any comments from members on topics not on the agenda

1. The president announced that Stefan Tretter for the Bavarian State Institute of Forestry (German delegation), Patrick Insinna for the Enviroment Office (Liechtenstein delegation), Karin Enzenhofer for WWF, and Ana Jurse of the Ministry of the agriculture, forestry and food (Slovenian delegation) had informed him of their inability to attend this meeting. In particular Ana Jurse informed him that Grega Voglar and Mr. Milan Kobal from Biotechnical Faculty of the Slovenian University will attend the meeting.

The Members of the Working Group approved the Minutes of the second meeting held in Bad Reichenhall (24 Oktober 2017).

2.a

The German Delegation proposed a draft structure of the reports that the WG has to elaborate on the basis of its Mandate:

- I° Paper: Interdependencies between mountain forests and flood protection;
- II° Paper: Interdependencies between mountain forests and freshwater provision.

The Italian Delegation collected some best practices regarding the main topics (freshwater provision and flood protection) and presented the 3 Italian case studies:

1. Royal decree 3267/1923;
2. protection of water supply areas: Plans elaborated by the Province of Trento and Bergamo;
3. "Protection Forest" project in south Tyrol.

Italy proposed to translate the document as a “Manifesto” containing the values of the protected forests, defining some concrete commitments to be taken by Countries and to submit to the territories and the local populations. Furthermore, proposed to elaborate a template to collect the good practices: one template to describe the state of the art in the alpine countries, including the regulatory aspects, data and information on the protected forests and a second template for the best practices.

The Austrian Delegation presented, as good practice, the PROLINE-CE Project (Central Europe Programme) that covers the question of drinking water and flood protection.

By mid-February the WG decided to elaborate a first draft of these two reports. Afterwards the WG can verify the necessity to have a summary version of the Reports and a brochure (in the 4 alpine languages + EN) addressed to the population and general public. As for the previous Mandates the WG would like also to submit a Declaration to the Alpine Conference. The members decided that all the printed materials should be printed on certified paper for sustainable forest management.

This approach will be valid also for the second report (Report for the PC, Declaration for the Ministers, brochure for the general public and population).

The members decided the structure/index for both Reports (see document attached). Comments/suggestion should be sent to the Chair by the end of November.

It is also necessary to have a referent for each report, so that this person can receive/collect the contributions and draft the Report. Italy (Enrico Calvo) can manage the contributions for the first Report on Interdependencies between mountain forests and freshwater provision and asked the Delegations to send him the written contributions in English in order to put these together. He will also get in contact with the other Delegations.

Concerning the second Report Interdependencies between mountain forests and flood protection Germany (Stefan Tretter) is responsible for Chapters 1 and 2 while Italy (Francesco Dellagiacoma) for Chapters 3 and 4.

With the sending of the Minutes, the Members will also receive the templates for the collection of the good practices. Also on that, comments and suggestions should be sent within at most 25 November 2017.

The Chair asked to verify if there are some interrelationships with the other WGs/PFs and the AG of EUSALP avoiding to have duplication/overlapping. The Chair will also get in contact with the Platform of Planalp in order

to check with them how the thematic of the forests protection is described in the new RSA. Furthermore, the Chair asked the PSAC to have more information about the board on green economy and check if it's possible organize a WS on the topic forest & green economy.

About green economy, the chair refers that Christoph Dürr of the Swiss delegation wrote to our working group pointing out that there are two recent publications of UNECE/FAO, which might be of our interest: "Rovaniemi Action Plan for the Forest Sector in a Green Economy" and "The Value of Forests: Payments for Ecosystem Services in a Green Economy" and to get more information we can take contact with the UNECE/FAO forest and timber section, Mrs. Paola Deda.

info@alpconv.org

THE SILVUCULTURE IN THE ALPINE FORESTS

GREEN ECONOMY AND FUNCTIONS OF ENVIRONMENTAL PROTECTION

28 June 2018, Santo Stefano di Cadore (BL)

Rinaldo Comino

EGTC Euroregio Without Borders

(European Group for territorial Cooperation
Autonomous Region Friuli Venezia Giulia, Region Veneto, Region Carinzia)

The Protocol Mountain forests of the Alpine Convention The National board on wood supply chain and the new forestry law

info@alpconv.org

"MOUNTAIN FORESTS" WORKING GROUP generality (1/…..)

Forests represent a distinguishing element of the Alpine region.

If the forests are managed sustainably, they can carry out many important functions:

- soil conservation
- protection against natural disasters
- renewable sources of raw materials (WOOD)
- energy sources and employment opportunities
- mitigation of climate change
- ecosystem conservation and protection of alpine landscape

With the mandate 2018-2018 the Working Group, established in 2012 in Poschiavo (CH), is working towards the implementation of the Alpine Convention ***Protocol on Mountain Forests***.

info@alpconv.org

(1/…..) *"MOUNTAIN FORESTS" WORKING GROUP - generality*

The Working Group "Mountain Forests" was established in 2012.

It works in the framework of the Protocol "Mountain Forests" of the Alpine Convention and is contributing to the intersectional cooperation according to the Multiannual Work Programme of the Alpine Convention, particularly in the following areas:

- climate change
- Biodiversity
- Tourism
- green economy.

info@alpconv.org

(2/…..)*"MOUNTAIN FORESTS" WORKING GROUP - generality*

The Working Group has an important role for the forest system in the field of adaptation policies development at regional and local level, as well as in the light of its potential absorption function.

In the areas of adaptation policies the Working Group is acting in accordance with the Action Plan on Climate Change in the Alps and in the context of the implementation of the Protocol "Mountain Forests" with a goal to promote the conservation of forest areas that are exposed to natural hazards and to maintain the protective function of forests, including harmonization of the instruments for monitoring of the impact of climate change.

The Working Group also oversees the issues related to the production of raw materials and renewable energy sources and ***promotes the use of wood***.

info@alpconv.org

(4/…..)*"MOUNTAIN FORESTS" WORKING GROUP - generality*

In cooperation with other Working Groups and Platforms:

1. Transport Working Group
2. Natural Hazards Platform - PLANALP
3. Ecological Network Platform
4. Water Management in the Alps Platform
5. Large Carnivores, Wild Ungulates and Society Platform - WISO
6. Macro-regional strategy for the Alps Working Group
7. Mountain Agriculture Platform
8. Mountain Forests Working Group
9. Sustainable Tourism Working Group
10. Ad-hoc Expert Group on Spatial Planning
11. Green Economy Advisory Board
12. Alpine Climate Board

the WG helps to keep the Alpine biodiversity and to protection it from the effects of climate change. Such consequences are: moving of the flora and fauna to higher altitudes, changes in the forest structure and the alpine habitat.

info@alpconv.org

(4/…..)*"MOUNTAIN FORESTS" WORKING GROUP - generality*

Mountain forests are a distinguishing element of the alpine landscape and have an important recreational function therefore the Working Group is also active in the field of tourism, especially by the collection of good practices for evaluation of the forests through sustainable forest tourism and other activities that contribute to the development of green economy in the Alpine arc.

During the years 2017-2018, on the basis of the results achieved in the years 2015-2016, the mandate and the activities of this WG focuses on:

- the protective function of the Alpine Mountain Forests
- the activities for the recognition and valorization of the ecosystem services in the Alpine forests.

info@alpconv.org

(4/…..)*"MOUNTAIN FORESTS" WORKING GROUP - generality*

In particular, the WG is collecting policies and good practices related to the role that Alpine forests play toward a low carbon, sustainable and social inclusive economy for the Alpine area, considering wood, energy and non-wood products and describing interdependencies between the protective mountain forests and the protected sectors in the fields of "freshwater provision" and "flood protection".

info@alpconv.org

(1/…..) *MOUNTAIN FORESTS" WORKING GROUP - generality*

The ***main objectives*** of the Working Group are:

1. Development of two reports on the main topics, with information, good practices, implementation opportunities and recommendations for operators and policy makers.
2. Organization of workshop on important topics related to mountain forests and at least one technical conference within the initiatives of the Austrian Presidency of the Alpine Convention.
3. Increased awareness about the role of forest in a green economy.
4. Dissemination of good practices and promotion of sectoral and inter-sectorial experience exchange and cooperation.
5. Transfer of knowledge regarding the topics to interested and/or relevant stakeholders, municipalities and local/regional authorities.

info@alpconv.org

(1/…..) *MOUNTAIN FORESTS" WORKING GROUP - generality*

main objectives

6. Promotion of forest management.
7. Contribution to climate change mitigation.
8. Protection of the Alpine biodiversity.
9. Data collection.
10. Collection of good practices.
11. Cooperation with other Working Groups and Platforms of the Alpine Convention (namely with Water Management Platform and PLANALP, Mountain Farming Platform and the WG Macroregional Strategy)

 info@alpconv.org

(1/…..) *The mandate 2017-2018 - Presidency: Italy*

MEMBERS OF WORKING GROUP ON MOUNTAIN FORESTS

Name	Organization	Country
Presidency		
Rinaldo Comino	EGTC/Euregio "Senza Confini"	Italy

Members		
Josef Fuchs	Land Tirol	Austria
Martin Höbarth	LKÖ	Austria
Johannes Schima	Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management	Austria
Hubert Siegel	Austrian Federal Ministry of Agriculture and Forestry, Environment and Water Management	Austria
Claire Morlot	MAAF - DGPE - SDFCB - BGeD	France
Aljoscha Requardt	Federal Ministry of Food and Agriculture	Germany
Stefan Tretter	Bavarian State Institute of Forestry	Germany

Members		
Enrico Calvo	Regional Agency for Agricultural and Forest Services - ERSAF	Italy
Davide Pettenella	University of Padua	Italy
Claudio Ferrari	Autonomous Province of Trento	Italy
Maria Teresa Idone	EURAC Research	Italy
Patrick Insinna	Office of Environment	Liechtenstein
Ana Jurše	Ministry of the Agriculture, Forestry and Food	Slovenia
Christoph Dürr	Federal Office for the Environment	Switzerland
Simon Beerens-Bettex	AEM	
Primož Skrt	Alpine Space Programme	
Zoanetti Roberto	Arge Alp	

Sara Verones	Arge Alp
Karin Enzenhofer	WWF
Giulia Gaggia	Permanent Secretariat of the Alpine Convention

dott. Rinaldo COMINO Chair of the Working Group on Mountain Forests (*EGTC Euroregio Without Borders*)

info@alpconv.org

The Italian presidency 2017-2018 of this WG is held on behalf of the EuropeanGroupTerritorialCooperation Euroregio Without Border

It is an organization that consists of this founding members:

- Autonomous Region Friuli Venezia Giulia (Italy)
- Region Carinthia (Austria)
- Region Veneto (Italy)

The constituent document was signed on 27 November 2012

The EGTC was established in order to facilitate and promote cross-border, transnational and interregional cooperation between its members for the strengthening of no profit economic and social cohesion.

The EGTC represents an area of about 35.800 square kilometers in which live about 6.8 million inhabitants.

The EGTC remains open to potential new members. At present it is being applied to join the Istrian County (HR)

info@alpconv.org

(1/…..) ***The mandate 2017-2018 - Presidency: Italy***

1. Correlation with the corresponding protocols of the Alpine Convention

The activities to be developed during this period will aim at implementing provisions set by Art. 6, Art. 7 and Art. 8 of the Mountain Forest Protocol:

Article 6 Protective functions of the mountain forests

1. For the mountain forests that have a highly protective function for their locations and, especially, for the inhabited areas, for the transport infrastructures, for the farmed lands, etc., the Contracting Parties undertake to give priority to that protective function, focusing the forest's management to that purpose. These forests must be conserved on site.

2. The measures necessary must be planned and implemented with technical expertise with respect to management plans and improvement plans of the forests that provide protective functions, taking into account the objectives of conserving nature and the landscape.

info@alpconv.org

(1/…..) *The mandate 2017-2018 - Presidency: Italy*

Article 7 Economic function of mountain forests

1. For mountain forests, where the economic function prevails and the regional economic situation makes it necessary, the Contracting Parties undertake to ensure that the mountain forest economy can continue its role as a source of employment and income for the local community.

2. The Contracting Parties shall ensure that reforestation is applied using tree types suited to the sites and that the economic use of the forests is done with care and attention to the soil and the forestry resource.

info@alpconv.org

(1/…..) *The mandate 2017-2018 - Presidency: Italy*

Article 8 Functions of a social and ecological character of mountain forests

Considering that mountain forests have to provide important functions of a social and ecological nature, the Contracting Parties undertake to adopt measures that ensure:

- their effectiveness for water resources, climate balance, cleaning the air and noise protection
- their biological diversity
- the enjoyment of nature and the recreational functions.

 info@alpconv.org

(1/…..) *The mandate 2017-2018 - Presidency: Italy*

2. Coherence with the topics of the 2017-2022 Multiannual Work Program of the Alpine Convention:

- priority “Greening the economy” – The forest sector has a key role to play in the transition towards a greener and more sustainable economy, especially in often fragile rural and mountainous areas;

- priority “Conserving and valuing biodiversity and landscape” - Stable and resilient forests, with a high degree of biodiversity, maximize their effectiveness of providing freshwater and flood protection ecosystem services.

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

3. The core activities

1. Collection of policies and good practices related to the role that Alpine forests play toward a low carbon, sustainable and social inclusive economy for the Alpine area, considering wood, energy and non-wood products. *The forest sector contributes already largely to the green economy*, but could play an even more significant role if governments and others take *measures to support and improve the consumption of forests products and the wider adoption of modern wood energy*

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

3. The core activities

2. Description of interdependencies between the protective mountain forests and the protected sectors in the fields of “freshwater provision” and “flood protection”.

Collection of good practices of sustainable forest management to preserve and, if necessary, restore multifunctional mountain forests, while enhancing biodiversity conservation.

Ecosystem services of alpine forests represent a cornerstone for the Alpine Region for both the Alpine population and for the adjacent European regions in the context of climate change, rural development, the European Green Infrastructure strategy, green economy and the relation between the Alps and surrounding areas.

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

4. Expected results

Expected results:

- ***Increased awareness*** about
  - the role of forest in a green economy within the Alpine Region
  - the two ecosystem services freshwater provision and flood protection

- ***Transfer of knowledge*** regarding the topics to interested and/or relevant stakeholders, municipalities and local/regional authorities.

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

5. Expected outputs

- Two reports with information, good practices, implementation opportunities and recommendations for operators and policy makers about:

1- *The interdependency between the protective mountain forests and the protected sectors in the field of "freshwater provision" and "flood protection"*

2- *The contribution of the forest sector to the green economy*

- At least one technical conference with the focus on the above mentioned main topics within the initiatives of the Austrian Presidency of the Alpine Convention.

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

6. Cooperation with other Working Groups and Platforms of AlpConv

- The WG, looking for a greater cooperation on cross-cutting themes among WGs and PFs, wants to cooperate positively with:

  - Water Management Platform and PLANALP in terms of the role water related ecosystem services;

  - Mountain Farming Platform especially in terms of promotion and development of non-wood forest products (NWFP);

  - Energy Platform in terms of sustainable production, use and consumption of wood from Alpine forests (e.g. with regard to sustainable energy production from biomass);

  - Ecological Networks PF in terms of forest ecosystem services.

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

6. Cooperation with other Working Groups and Platforms of AlpConv

An hypothesis of concrete cooperation between “Mountain forests” WG and “Sustainable Tourism” WG

- the role of an increasing use of renewable raw materials (among them the wood) in the promotion of a more environmentally friendly tourism
- modernization of tourist destinations concerning the energy sources, in a strategic framework aimed at reducing carbon dioxide (CO_2) in the atmosphere

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

7. Activities in the scope of EUSALP strategy

- The WG underlines the importance of the multifunctional services of the alpine forests and of the forestry sector for many topics of EUSALP, because of the large forested area in the Alps and the interrelation among climate change, natural risks, resources, green and bio-based economy.
- In order to contribute to the role that the Alpine Convention is playing in the further implementation of EUSALP and its Action Plan, the WG will share with the WG Macroregional Strategy relevant information on its own activities and, as appropriate, on the relevant developments within the other Action Groups of EUSALP.
- The activities could relate in particular to the following areas:

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

7. Activities in the scope of EUSALP strategy

- Action Group 2 “To increase the economic potential of strategic sectors” aimed at, among other, promoting agriculture and sustainable forestry sector based products and services, ***labeling Alpine wood*** and ***bio-economy***.
- Action Group 6 “To preserve and valorize natural resources, including water and cultural resources” containing specific focus on forests.
- Action Group 8 “To improve risk management and to better manage climate change, including major natural risks prevention”, which is interested in a close contact to forests.

info@alpconv.org

The mandate 2017-2018 - Presidency: Italy

7. Activities in the scope of EUSALP strategy

For example:

- within the AG2, Mountain Forests WG could contribute to the discussion on the alpine timber, also in a logic of promoting short chains and cluster initiatives, in a general framework for reduction of carbon dioxide (CO_2) emissions
- within the AG6 - sub-topic 2 “Future oriented farming and forestry”, Mountain Forests WG could contribute to the activities foreseen for the promotion and marketing of food and forest products especially in urban areas, which are sustainably produced and processed in the EUSALP mountain and rural areas to maintain cultural and ecosystem services.

 info@alpconv.org

"TRIPLE WOOD - sustainable wood building culture in the alpine region"

EUSALP - AG 2: an interesting ongoing project

Lead partner	Baden-Württemberg (Gernmany): Ministry of economic affairs, labor and housing
Partner	Switzerland: Lignum wood economy (Swiss wood portal) South Tyrol (Italy): Energy agency clima house Baden-Württemberg (Gernmany): proHolz BW – enterprises private organization Auvergne Rhône-Alpes: Regional union of forest municipalities association Slovenia: Ministry of Agriculture, Forestry and Food
Observers	Baden-Württemberg: Ministry of rural affairs and consumer protection Austria: proHolz AT (private organization representing enterprises) Friuli Venezia Giulia (Italy): Regional Forestry Service

Building with wood is active climate protection because it reduces the emission of CO_2.

The project e aims to triple the use of wood in the building sector within the near future.

This should be done in a sustainable, energy-efficient way and on a high quality level.

Exhibition, seminar and "road show" will show best practice of wood buildings in all kinds of typologies (private and public, rural and urban, high and low rise.

By this the public, stakeholders, professionals and decision makers will learn more about the advantages of building with wood and stereotypes against wood buildings can be dismantled.

The forest and timber section is one of the most important economic factors in the alpine region, in urgent need of being protected and promoted, towards an integrated approach along the value chain.

Proposed example of wood buildings best practice

Voluntary market **Local Carbon Credit** **Wood products**

SaDiLegno italiano

CARBOMARK

Udine Fiere
Udine e Gorizia Fiere SpA

20 tCO_2

2.000,00 €

seller

buyer

Contract

SaDiLegno,
Samuele Giacometti:

17-05-2013 Fiera EOS (UD)

Progetto:

REGIONE AUTONOMA FRIULI VENEZIA GIULIA

REGIONE DEL VENETO

Patrocinio:

Regione Friuli Venezia Giulia

Informazioni:

www.carbomark.org
www.udinegoriziafiere.it
www.sadilegno.it

EUSALP BAYERN 2017

Enhancing forest heritage increasing carbon stocks in wood materials and products.

part 2: The National board on wood supply chain and the Italian new forestry law

LEGISLATIVE DECREE n. 34 OF 3 April 2018

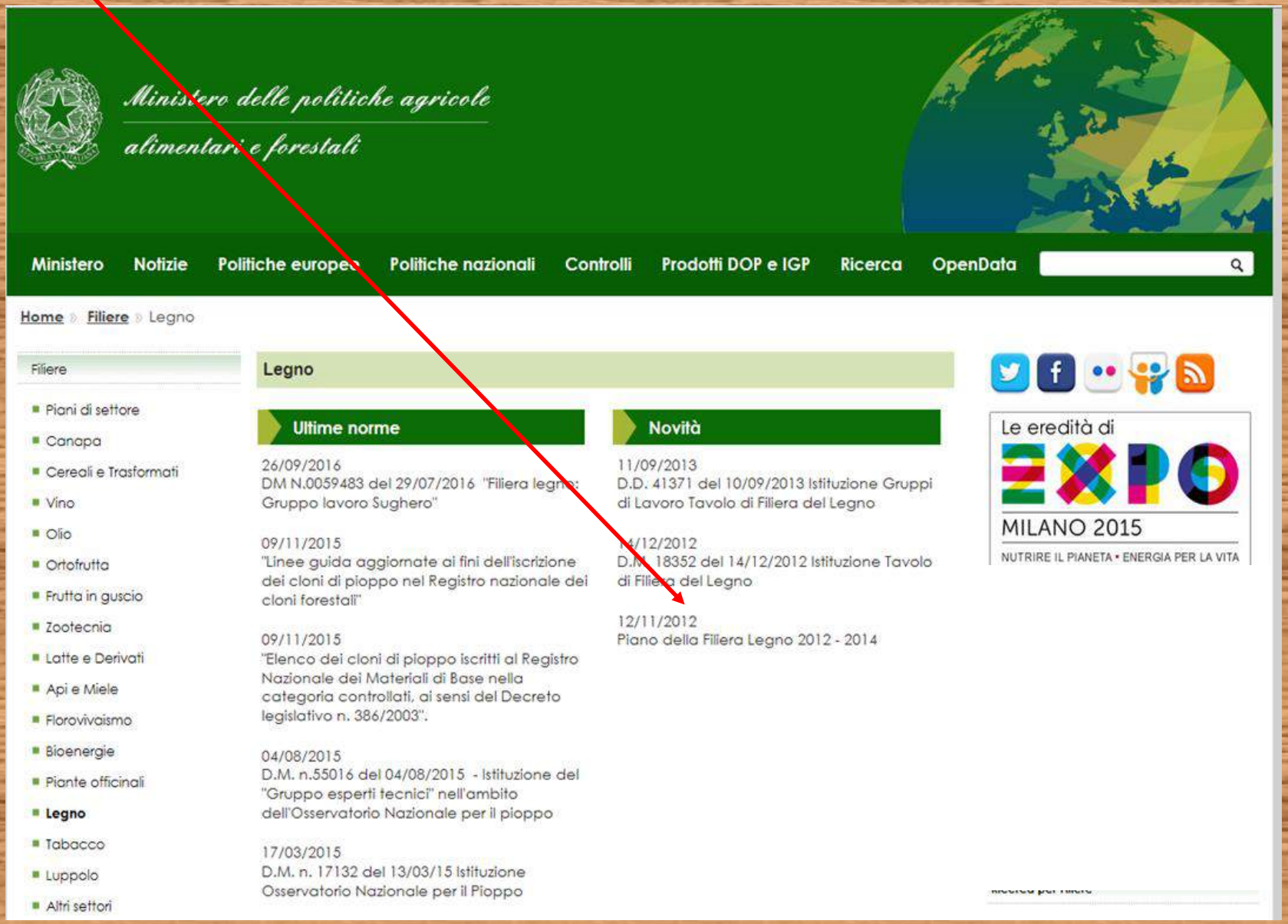
(Single Act in the field of forestry and wood supply chains)

As part of this intervention, I was asked to make a final mention also on the salient aspects of the activities of the Italian National board on wood supply chain and on the new Italian forest law.

I will also give some hints as an officer of the forest administration of the Autonomous Region of Friuli Venezia Giulia.

About 6 years ago, Italy began a cooperation with stakeholders of the forest sector, the wood processing sector and state and regional institutions, aimed at implementing the national plan on wood supply chain and hence an active and sustainable management of Italian forests by activating a variety tools, including the revision of forestry legislation.

The Plan can be downloaded from the Supply chain Section of the website of the Italian Ministry of Agriculture, together with a series of documents of interest for the wood sector



The 3 thematic areas of the Wood Supply Chain Plan

The Plan defines as its General Objective: "the promotion of a sustainable, competitive and integrated development of the National Wood Supply Chain, encouraging active management of the forest heritage and ensuring multi-functionality and biological diversity of resources in the long term",

The Plan identifies three thematic areas for priority intervention:

1. Modernization and simplification of forest legislation;
2. Enhancement of the forest heritage and the national wood product;
3. Consolidation of the knowledge and research system for the forest sector.

Regarding the modernization and simplification of forest legislation, the priority actions are:

1. Adopt the Single Act on Forestry at the national framework
2. Promote the national coordination of the Registers of the enterprises and the licenses for forest operators by harmonizing the various Regional regulations.

Highlights of the new law:

1. New definition of wood
2. Reorganization of forest monitoring and statistics
3. Forest Programming, Planning and Management (Regional Forest Programs and other forms of "over" corporate planning)
4. Discipline of the transformation of the forest
5. Introduction of good practices of forest management
6. Promotion and operation of forest management activities
7. Forms of substitution and disposal of forest areas (introduction of the principle and methods of intervention in abandoned forests)

The National Plan MEANWHILE has been applied for the first time with the *Interregional agreement on wood harvesting in the wood and on the wood supply chain*, with commitments to be pursued with targets and within time limits, the results of which are strictly bound to the desired amendments of state rank (Legislative Decree 227/2001 - Orientation and modernization of the forest sector, Legislative Decree 42/2004 - Cultural Heritage and Landscape Code, etc.)

AGREEMENT
Launched
at'EXPO Milan
27 October 2015

AGREEMENT
Signed
in VERONA
26 Februari 2016

I SOTTOSCRITTORI

REGIONE PIEMONTE

RegioneLombardia

RegioneEmilia-Romagna

REGIONE DEL VENETO

REGIONE AUTONOMA FRIULI VENEZIA GIULIA

REGIONE LIGURIA

FLA FEDERLEGNOARREDO

BOSCHIVE IMPRESE CoNaBo COORDINAMENTO NAZIONALE

COLDIRETTI

Federforeste

UECOOP

CONFAGRICOLTURA

alleanza delle Cooperative Italiane

AIEL ASSOCIAZIONE ITALIANA ENERGIE AGROFORESTALI

Confederazione italiana agricoltori

CONSIGLIO DELL'ORDINE NAZIONALE DEI DOTTORI AGRONOMI E DEI DOTTORI FORESTALI

Confartigianato

fiper FEDERAZIONE ITALIANA PRODUTTORI DI ENERGIA DA FONTI RINNOVABILI

PEFC PEFC/18-1-1 Promuoviamo la gestione sostenibile delle foreste

UNPROFOR UNIONE NAZIONALE PRODUTTORI FORESTALI

Sottoscrittori a margine

Regione Umbria

Provincia Autonoma di Trento

AUTONOME PROVINZ BOZEN SÜDTIROL — PROVINCIA AUTONOMA DI BOLZANO ALTO ADIGE

CNA Confederazione Nazionale dell'Artigianato e della Piccola e Media Impresa

UNCEM

ANARF

anci

italian delegation alpine convention

Espressione di interesse

New definition of wood (art.3)

For matters falling within the exclusive competence of the State, the areas covered by forest tree vegetation, associated or not with the shrub area, of natural or artificial origin at any stage of development and evolution, with an extension not less than 2,000 square meters, width average not less than 20 meters and with forest tree crown cover greater than 20 percent.

Regions, as far as they are concerned and in relation to their territorial, ecological and socio-economic needs and characteristics, can adopt a supplementary definition of wood below that laid down in paragraph 3, as well as additional definitions of areas similar to woods and areas excluded from the definition of wood, provided that the level of protection and conservation thus assured to forests is not diminished as fundamental of the quality of life.

Forest programming and planning (art.6)

In line with the National Forest Strategy, the regions identify their objectives and define the related lines of action. To this end, the regions adopt regional forest programs

Regions can set up ***territorial Forestry plans*** within homogeneous territorial areas.
The territorial Forestry plans contribute to the drafting of the Landscape plans as per Legislative Decree 22 January 2004, n. 42 (Cultural heritage Code).

For the approval of Forest management plans, if they comply with the territorial forestry plans, the Superintendent assent is not required for the part concerning the construction or adaptation of the forest road system as per point A.20 of Annex A of the decree of the President of the Republic February 13, 2017, n. 31

Wood cuts: lights and shadows

The ***silvicultural technique***, to be applied from time to time to each type of forest, is always a guarantee of perpetuating the forest, ALSO of its AESTHETIC value in place to protect the landscape, given that the Italian forest is a category

Can a landscape rule, that provides for the exemption from the authorization of the crop cut in the woods ex art. 142 of the Code and that, at the same time, provides for the obligation if the same area falls also among those protected by art. 136 of the Code itself, be considered reasonable?
Is the wood, although a slowly but dynamic entity, the same?

Wood cuts: lights and shadows

A step forward but not definitive is the reform that introduces good forest practices.

The silvo-environmental commitments, compatible with the compensation for the EU rural development program, are linked to the silvicultural activities aimed at:

- to achieve the spontaneous and natural renewal of the forest with tall trees, even through small holes in the ground
- to the conversion of the wood for short rotation towards timber forest or the maintenance of the timber forest government

Contained in the text of the exceptions, it still makes it difficult to recognize adequate compensation for those who make naturalistic silviculture.

Ossiach (Carinzia - Austria)

Cansiglio (Pordenone)

Pontebba – Pramollo (Udine)

Forest viability: lights and shadows: Unlike the other European countries with a forest vocation, in Italy there is still a "forest" of administrative procedures for the overlapping of state and regional regulations:

a) Landscape (double restraint, etc.)
b) Urban Planning-building
c) Hydro-geological restraints
d) Impact assessment if Natura 2000 and environmental impact assessment
e) Hydraulic, etc.

In addition there are instances of refusal, even landscaping, for interventions of construction of forest roads completely normal;

si esprime parere contrario al rilascio dell'autorizzazione paesaggistica in quanto è stata accertata la incompatibilità tra interesse paesaggistico tutelato e intervento proposto per i seguenti motivi:

- la realizzazione della careggiata stradale di larghezza complessiva di m. 3,50, comporta il taglio di numerose alberature nel bosco, risultando in contrasto con le esigenze di tutela dell'ambito vincolato.

Today the distance towards a point of equilibrium between the rules, primarily landscape, and the proposal made by the board on wood chain, remains. Even the recent Presidential Decree 31/2017 on landscape simplification went against the opinion of the State - Regions Conference, for the purpose concerned. The new Consolidated Law of 2018 partially simplifies, and not as necessary, the activities of forest managers already in possession of forest management plan and certification and sustainable forest management.

the construction, adaptation and maintenance of forest roads for the agro-silvo-pastoral activity, forbidden to ordinary transit, *do not involve transformation of the forest if foreseen in the forest planning instruments in force,* because they are functional to guarantee:

- active protection of the territory and the landscape
- prevention and intervention against disasters of natural and anthropogenic origin
- forest management

This principle on accessibility to forests must sooner or later become a transversal cornerstone of the state legislation, provided that the traffic is contained in the planning of the approved property, as requested by the supply chain board and by the Regions

Foresta di Fusine – Tarvisio (Udine)

Foresta di Pramosio - Paluzza (Udine)

Valico di Tarvisio
(Udine)

Forest viability: lights and shadows

Abandoned woods and forms of substitution **(art. 12)**

Forms of substitution and sale of forest areas

The regions can lay down rules for the concession in management of forest areas owned by public bodies.

The regions, if there are serious and recognizable processes of degradation, or there are reasons of public safety, dictate rules and define the necessary interventions, so that the removal of processes in progress is guaranteed.

The owners or holders of the lands affected by the degradation processes provide for the implementation of the planned interventions coordinated and in agreement with the competent Authorities or through the signing of agreements or commitments for a temporary sale of their surfaces. In cases where it is not possible to reach an agreement or the legitimate owners are not identifiable or available, the Regions may implement temporary substitution forms in the management of the wood of the surfaces.

The Regions or Bodies delegated can proceed with the implementation of the planned interventions with forms of substitution or entrustment of the management of the affected land, to the companies, consortia or other forms of association or to other public or private subjects, identified through a procedure public.

The regions or bodies delegated for the management of any profits, may prepare an appropriate chapter of the financial statements, to be kept in an interest-free deposit for a maximum period of 3 years starting from the actual availability of the same. After this deadline, in the absence of a request for liquidation by the owners of the areas, the sum must be invested by the Region or by the bodies delegated by them, for projects necessary to ensure the economic, environmental and landscape exploitation of the woods

Comunication (art. 15)

The Ministry of Agricultural Food and Forestry Policies, also in agreement with the regions, can promote within the limits of available resources to current legislation, initiatives and activities of information and public dissemination as well as education and communication on the meaning and role of the forest, management forestry, production chains and services generated by forests and their rational management, in favor of society

A communication plan at national level, as envisaged among the actions promoted by the Wood Supply Chain Board in coordination between the Ministries of Agriculture and forests, of the Environment and of the Cultural Heritage, integrated and coordinated with initiatives at regional level as envisaged by the interregional agreement of Verona previously mentioned, is necessary to work in an integrated way between administrations and promote together the forest heritage of Italy in the sign of MULTIFUNCTIONALITY and of the wood product as a renewable raw material, transformable by the thousands of companies in the wood sector that compose Made in Italy, without neglecting the realities that produce energy with the residues.




Fusine (Udine) 920 m s.l.m.
inverno 2008 - 2009

D’intesa con i portatori di interesse del settore forestale, del legno e dell’ambiente, lavorare insieme per un giusto equilibrio tra uomo e natura

Thank you for your attention

Rinaldo **COMINO**

EGTC Euroregio Without Border

Alpenkonvention – Convention alpine - Alpine Convention – Alpska konvencija

Chair of the Working Group on Mountain Forests

And

Regione Autonoma FRIULI VENEZIA GIULIA (Italia)

Servizio foreste e Corpo forestale

tel. +39 0432 555157 - cell. +39 335 7737187 - mail: rinaldo.comino@regione.fvg.it skype: rinaldo.comino67

4° meeting of the Mountain Forests Working Group

Vecna pot 2, 1000 Ljubljana

12.12.2018

Minutes

Presidency: Rinaldo Comino
Members:
Germany: Stefan Tretter
Austria: Hubert Siegel
Slovenia: Ana Jurse
Arge Alp: Roberto Zoanetti
P.S.A.C.: Giulia Gaggia (skype conference)

observers
Slovenia: Grega Voglar, Milan Kobal, Tine Grebenc, Alexander Marinsek, Ursa Vilhar; Primoz Simoncic; Iztok Sinjur (Slovenian Forest Institute)
Italy: Graziano Martini Barzolai (representing the Ministry of the Environment)

At 9.00 the president start the meeting by thanking all the participants, and especially the slovenian collegues who organized the event here in Ljubljana, allowing full involvement of the Alpine Convention on the theme of forests in the easternmost part of the Alps.

The presence of many membres of the Slovenian forestry institute as observers is very appreciable for the work of working group and which and they were invited by the President to make their reflections and proposals on the topics we deal with, obviously not binding but useful for enrich the discussion. The president of the working group give the floor to the Slovenian forestry institute director for some word to explain the members of the working roup what are they doing and their programm. Director Primonscic referred to the basic function of forest planning.

After that the president illustrates the items to be discussed:

1. approval of the minutes of the third meeting held in Santo Stefano di Cadore the 28th june 2018.
2. Closure of the first report “Interdependencies between mountain forests and flood protection and freshwater provision”
3. Discussion on what to do with the drafting of the second report “The contribution of the forest sector to the green economy”

4. Concrete proposals to be included in the new mandate 2019-2020

The president announced that Enrico Calvo for ERSAF Lombardy (Italian delegation) the Bavarian State Institute of Forestry (German delegation), Karin Enzenhofer for WWF, Davide Pettenella for University of Padova (Italian delegation) had informed him of their inability to attend this meeting.

1. approval of the minutes of the third meeting held in Santo Stefano di Cadore the 28th june 2018.

The Members of the Working Group approved the minutes of the third meeting held in Santo Stefano di Cadore the 28th june 2018.

2. Closure of the first report "Interdependencies between mountain forests and flood protection and freshwater provision"

The president asked Stefan Tretter of the German delegation to illustrate the final version of the report "Interdependencies between mountain forests and flood protection and freshwater provision" in its entirety, given the absence of Enrico Calvo referring to the part of the report on fresh water provvision. Some information is missing for Austria and France and Switzerland: the president reports that those provided by other countries can be considered sufficient for the analysis and that in any case there is no more time.

3. Discussion on what to do with the drafting of the second report "The contribution of the forest sector to the green economy"

About the second report "The contribution of the forest sector to the green economy", having noted that up to now no proposals have been received for the preparation of the report, the chairman announced that he will provide it in an autonomous manner, taken into account what has already been reported by Christoph Dürr of the Swiss delegation pointing out that there are two UNECE/FAO recent publications "Rovaniemi Action Plan for the Forest Sector in a Green Economy" and "The Value of Forests: Payments for Ecosystem Services in a Green Economy".

The president announced that he will consider the availability of dr. Luca Cetara, collaborator of the Italian environment ministry and that he will also take into account some publications and among them the wich one reported by Enrico Calvo "Innovation and Circular Economy in the Mountain Forest Supply Chain: How to close the loop" of the European Association of mountain areas – Euromontana.

4. Concrete proposals to be included in the new mandate 2019-2020.

The president informs the working group that from the italian delegation came a proposal so articulated:

- Alpine wood market: where does the market go today? What are the current and future industrial models and how can these be linked to forest management models in perspective? (contractual aspects, addresses and policies, market instruments, infrastructures with organized platforms and deposits, relationships with forest enterprises, etc.).

- Cultural services: deepen which cultural services are developed (kindergartens and schools in the forest, paths and art locations, adventure parks, forests of the living, etc.), how they are structured and distributed, what impact they have on the local economy, etc.

Stefan Tretter (German delegation) points out that the subject of the next mandate should also be:

- sustainable production but also climate change; during the new mandate, cooperation between the Alpine Convention and the EUSALP Action Groups 2, 6 7 and 9 will have to be strengthened.

The President still signals other two themes to be added to those presented by tjhe italian delegation for the new mandate:

- the first one are the forest interventions to increase the resilience of woods in the face of climate change
- the second one, synergistically with the EUSALP strategy, the diffusion in the use in alpine areas of timber coming from the same geographical context (local wood) as a response to the need to reduce carbon in the atmosphere

The president indicates that each theme will therefore be reported.

==========

Once the items on the agenda have been completed, the discussion on the continuations of the working group is opened.

Giulia Gaggia (permanent secretariat of AC) reports that there will be an overall reorganization of the Alpine Convention and that the "mountain forests" could merge into a group that will deal with changes in agriculture and forests and sustainable products. The new mandate will focus a lot on the green economy. The new organization should start in mid-April.

Roberto Zoanetti (Arge Alp): this shift must be seen according to two points: a negative because it is a downsizing, the second is positive because so the data and the forest strategies come out and contaminate other sectors. It can facilitate an integrated and more productive strategy.

Martini Barzolai (observer for the Ministry of the Environment): there are many studies of the Alpine Convention and others like those on the teachings of naturalistic silviculture of the school of Florence and Padua that have not yet been sufficiently disseminated and today of great relevance. A task of the new mandate may also be to further disseminate the studies already done and open the databases of the regions and other bodies

Ana Jurse (Slovenian delegation): in reality we should be able to continue our work and be part of the Alpine space: forestry policy, tourism and climate change are central issues for this area; we must be able to remain a forest group and support the other groups.

Tine Grebenc (Slovenian Forest Institut. observer): in recent years the theme forests and forestry tend to disappear from the projects and one wonders why. This working group must keep and keep up the terms forests and forestry. Forests are the most important part of the Alpine arc. Ok to enter but to emphasize the importance that forests have.

Stefan Tretter: il is necessary to report that the forest sector must be present with specific points and to express clearly the disappointment for closing the working group. the theme of biodiversity must remain a priority.

The president notes that on the part of everyone there is a desire that the mountain forests, even if they flow into a new group, must remain central. Also that, the term "mountain forests" should remain in the title of the possible new group.

Interdependence between mountain forests and freshwater provision

The relationship between forests and the water cycle is scientifically well known although many relationships and factors have not yet found a precise quantification and definition in a certain and widespread way.

This relationship is expressed, on a different level according to a multiplicity of parameters and in conditions of different spatio-temporal scales, on the hydrological balance of a basin as well as on the quality of the waters that pass through a forest system.

The mechanisms of this last process are mainly to be found in the origin of waters, generally meteoric and therefore not subject to direct pollution phenomena deriving from human activities, in the characteristics of forest stands, but above all in the filtering capacity of forest ecosystems, due to the percolation of water in soils that have specific chemical-physical characteristics, but above all biological.

Geology plays also an important role, allowing or preventing infiltration, percolation through deep strata and underground flowing of water, even at long distance (karst).

The ability of forest ecosystems to "treat" the percolating waters that then go to load the stratums that originate sources is therefore an opportunity that should not only be better studied and investigated, but above all enhanced.

In fact, it is possible to rely on a biological purification system which, at reduced costs, makes it possible to restore quality standards to treated waters, which can be considered as potable or, in any case, of high biological value.

Most of the sources of drinking water in our countries come from sources or layers that are enriched under the cover of forests.

Identifying such situations, correctly planning the degree and area of protection areas of quality waters, promoting and supporting good forest management and agricultural practices are the right forms of investment in favor of a resource whose importance is essential and vital, but also in favor of a model of organic production that, in hand, is also cheaper.

These guidelines are present in the Sustainable Management Principles and Criteria of the Interministerial Conference on the Protection of Forests in Europe (MCPFE 2007) which in the Second Resolution "Forests and Water" declares the need for better forest management to protect and make water available for potable produced by forest ecosystems.

The Mountain Alpine Protocol itself of the Alpine Convention provides in art. 8 the commitment to adopt measures that effectively ensure the protection of water resources.

1. The role of the forest in the protection of water resources

In the complex water cycle forests play an essential role:

- Forest cover reduces the hydrogeological and erosion risk: the tree cover favors the infiltration of the water into the soil, reducing its outflow and increasing the stability of the soil through its root system;

- Forests influence the quantity and quality of the percolation water: the rate of evapotranspiration determines the quantity of water accumulated, the root development and the humus filter the water holding back the harmful substances (buffer effect), the canopy of the trees retain many pollutants weather

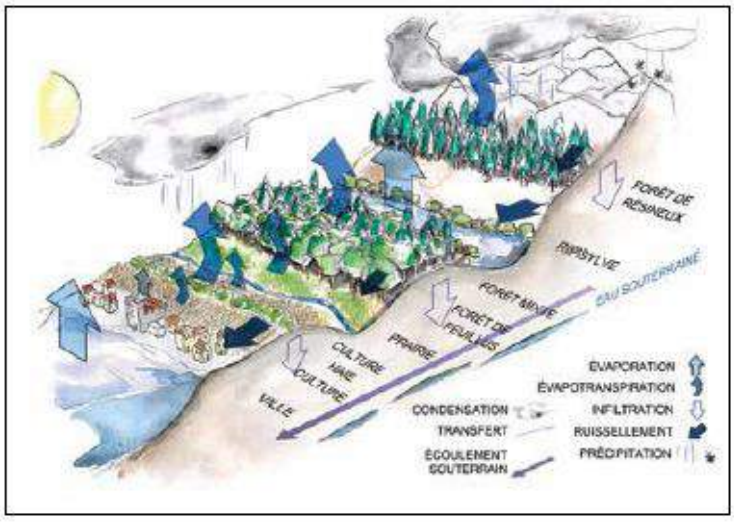


Fig. 1 - Water cycle in the territory

In particular, in relation to aquifers, the major studies confirm that:

- The infiltration is greater in forest soils than in other soils: the soils under the forest have a greater depth and an efficient porosity, due to biological activity and root developments. Moreover, forest soils and organic layers, acting like a sponge, allow a higher storage capacity, even if dependent on the type of soil: the first ten cm of forest soil are able to hold up to 50 l. of rain / sqm (OFEV, 2005); under a hectare of forest are produced every year 2-3.000 cubic meters of ground water (UFAFP, 2005; ForetSuisse, 2016);

- The forest is the best cover for the watersheds: the forest ecosystems are permanent, and the land cover is stable; in general, they are not affected by significant phenomena of direct pollution; the concentrations of nitrates and pesticides are lower than in soils with other types of cover, the biological activity of the forest soil guarantees an important buffer effect;

- The quality of water depends on the type of forest: in coniferous woods (acid environments and humus of the "moder" type) higher quantities of nitrates are washed away than in broad-leaved woods, because the conifers tend to take ammonia nitrogen rather than in the form of nitrate.

Also, the form of rooting is important. For example, silver fir, beech and sycamore have a deeper root systems than the spruce, so they explore a larger volume of soil and are able to bind more nitrates; the organic layers of the deciduous forests is more easily degradable than that of the coniferous woods: the humus of the "mull" type which results in it plays an important filtering action, allows to store the nitrogen in a more stable form and the superficial soil acidifies less due to the mobilization of basic substances in the deeper layers of the soil;

- The infiltration is greater under mixer stands of broad-leaved than coniferous forests;

- The water storage capacity of forest soils does not only depend on the soil itself, but also on the amount of humus in the soil. Therefore, it is important to manage forests in a way that protects and raises the soil humus. This includes measures as avoiding clearcuts, permanent vegetation cover of the soil and leaving at least a certain amount of wooden debris within the forests;

- The highest water storage capacity, even more than in the average forest soil, is found in peat soils. Peatlands, as well as riparian wetlands, are integral parts of natural, water storing forests, but most of the peat and forest wetland areas in the Alps have been lost over the last 200 years. Therefore, specific efforts should be made to conserve and protect the last remaining forest peatlands and wetlands.

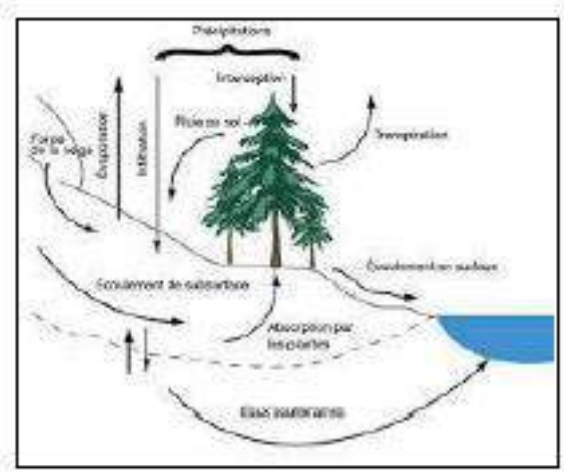


Fig. 2 - Water cycle and vegetation

In summary there seems to be a clear link between the forest and the quality of the water produced by a basin, a more variable relationship between the forest and the amount of water available and a variable relationship between the forest and the constancy of the outflow.

Furthermore:

- The forest is considered the best cover to protect the drinking water withdrawal areas;
- The age and composition of the forest, the type of soil and the management significantly influence the quality of the water;
- In the deciduous and mixed forests the nitrogen cycle is well balanced and there is less loss of nitrogen. These ecosystems can absorb high amounts of nitrogen.
- Forest ecosystems that have a high presence of nitrogen, such as coniferous forests, are much more sensitive and consequently forest management must be adopted;
- Natural disturbances or extensive cuts have a modest impact on the quality of groundwater, except for turbidity phenomena in relation to the logging methods.

2. The situation in the Alpine regions

The regulatory context

In all the countries of the Convention there are similar regulations that define specific protection zones of the catchment basins of drinking water, like a portion of the territory surrounding the water collection in which restrictions and limitations on the use are imposed for the protection of water.

Three protection zones are thus provided:

- Immediate Protection Area of the water collection: of modest dimensions around the collection, normally for a range of radius not less than 10 m.

In this area there is absolute protection, with the prohibition of any activity that is not inherent to the use, maintenance and conservation of the collection;

- Zone of Close Protection or Respect: its dimension and its geometry varies according to the aquifer system, includes the area of absolute protection and is delimited in relation to the local situation of vulnerability and risk of the resource, according to the geometric criterion or the hydrogeological one; in any case, it has a radius of no less than 100 m (in Italy this value is 200 m.), with the center at the point of collection, and it hydro-geologically extends upstream of the intake structure. In Switzerland the percolation duration calculated in 10 days is also considered;

- Extended Protection Perimeter: it does not have a mandatory character; its surface corresponds to the feeding and recharge groundwater area and to the source supply basin.

In Switzerland, this area is defined as a protection area to allow adequate time and space to intervene in the event of imminent danger.

In Switzerland there is also a fourth area, the Feeding Area (Zu), which is the area where 90% of the water can be collected.

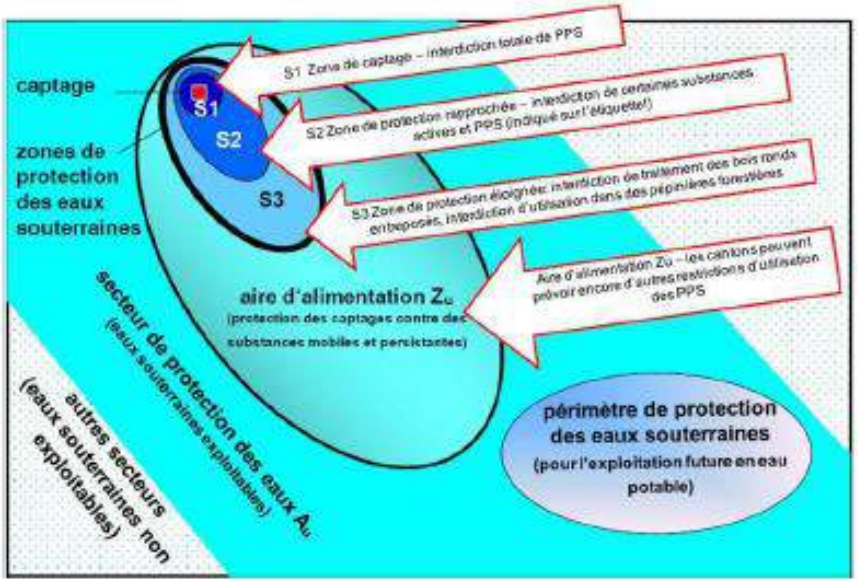


Fig. 3 - Scheme of protection zones for drinking water collection

Captations of drinking water in forests and protection forests

There are different ways of collecting groundwater for human consumption: in a simplified way, it is possible to distinguish between spring catches and groundwater collecting through wells.

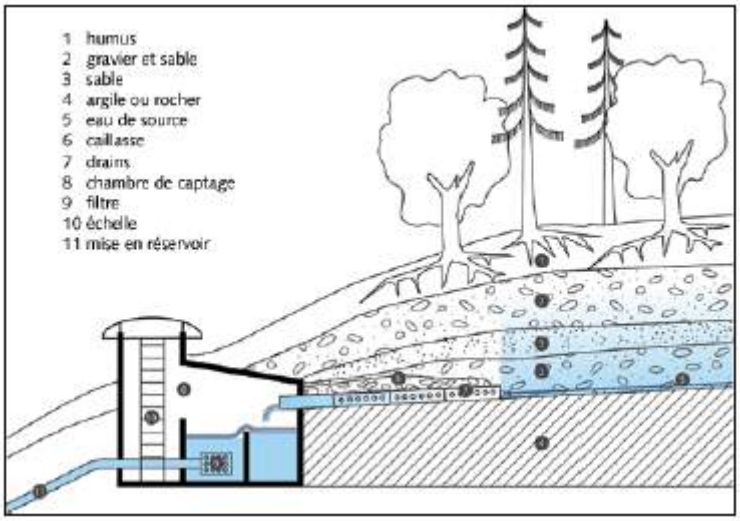


Fig. 4 - Source collection scheme

In this report we will consider only the sources, which are the typical forms of emergence of the water table on the surface, which are captured through the construction of works, generally consisting of a tunnel that is embedded in the rock on site which will channel the spring waters in a building in which are contained all the tanks and equipment that give rise to the aqueduct.

France

The French national forest inventory records, at national level, a data of ha. 44.800 of forests with a specific statute for the protection of drinking water catchment areas (www.inventaire-forestier.ign.fr).

However, at local level, in particular for some French Departments belonging to the Convention area, there are several more specific data:

Department	N. sources tot.	Production M mc/y	N. inhabitants supplied	Cost €./mc	Forest protection area	% forest area departments
Haute-Savoie	895	80	716.000	3,03	38.000 ha	21
Savoie	1300	50	411.000	3,47	22.700 ha	13
Isère	923	n.a.	1.197.000	3,03	49.000 ha	20
Alpes Haute-Provence	500	n.a.	162.000	2,56	44.000 ha	14
Alpes Maritime	352	135	940.000	2,56	43.000 ha	9

n.a.: not available

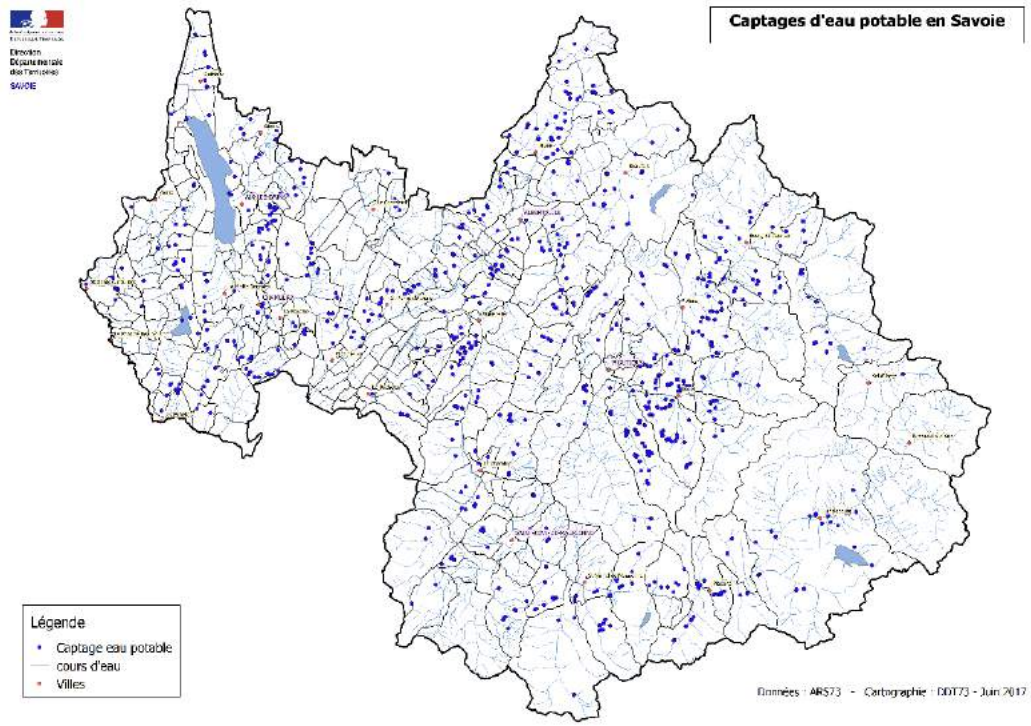


Fig. 5 - Water Captations in the Department of Savoy (F)

Switzerland

At national level, 42% of the groundwater protection zones are located within forest areas, which represent 27% of the total forest area and on which the specific protection rules apply (www.bafu.admin.ch).

From these sources, about 380 M m3 / year are produced, which represent 41% of the entire supply of drinking water.

In Switzerland all sources and the respective catchment areas are mapped.

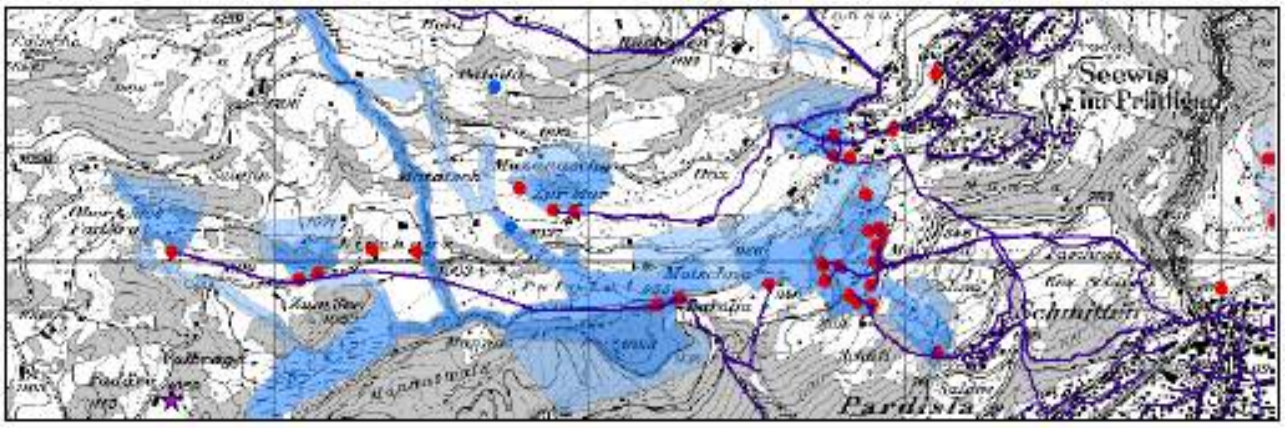


Fig. 6 - Sources and catchment areas in Switzerland

Regarding the data on drinking water resources in the territory of some cantons of the Convention area, the following data are available:

Cantons	**N. sources tot.**	**Production M mc/an**	**N. inhabitants supplied**	**Cost CHF./mc**
Ticino	450	80	289.000	2,00
Vallese	3600	n.a.	320.000	2,00
Grigioni	370	n.a.	197.550	2,00

n.a.: not available

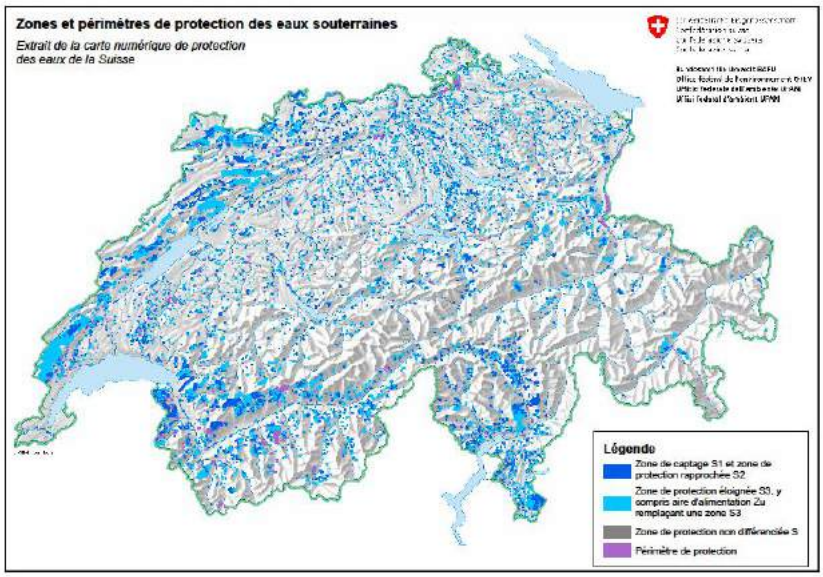


Fig. 7 - Zones and perimeter of groundwater protection in Switzerland

The forest areas that affect the protection areas of drinking water are defined by the Swiss Forest Inventory.

For the cantons belonging to the Alpine Convention there is a mean value (UFAFP, WSL, 2005):

CANTON	% WATER PROTECTION AREAS IN FOREST AREAS*	% FOREST SURFACES ON THE TOTAL CANTON *	FORESTAL CANTON SURFACE **
Appenzell Est	31,1	29,2	7.211
Appenzell Int	26,8	31,7	4.869
Berna	27,1	48	175.738
Friburg	24	32	42.440
Glarona	21,8	29,7	20.723
Grigioni	20,9	29,8	193.874
Lucerna	26,8	33,4	40.011
Nidvaldo	28,5	46,5	7.758
Obvaldo	33,4	28,6	18.659
Uri	12,2		20.616
San Gallo	25,5	33	56.207
Svitto	28,8	34,6	26.983
Ticino	36,8	57,2	142.930
Vaud	28,9	52,8	126.387
Vallese	18,0	23,6	108.837
Totale Area CA		40	993.243
Totale Svizzera	26,7	42	1.257.294

*UFAFP, WSL, 2005

** www.bfs.admin.ch – Economia forestale in Svizzera 2012

Italy

In the Lombardy Region 2.326 springs in forests were registered in the Convention area, equal to 56% of the total sources of the provincial territories involved, with an estimated annual production of about 146 M m3/ year of drinking water (Regione lombardia,2006).

The type of woods is mainly deciduous (59%), followed by coniferous (23%) and mixed (18%) woods.

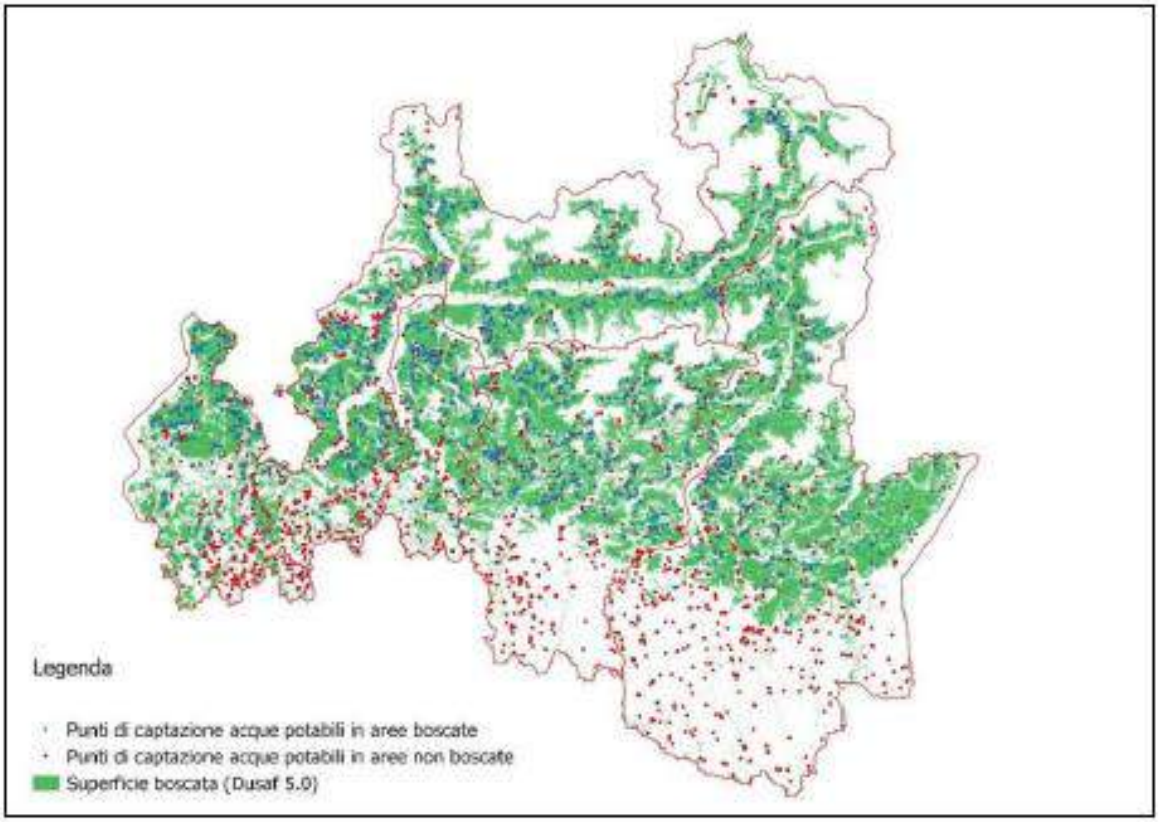


Fig. 8 - Classification of the points of collection of drinking water located in wooded areas - Lombardy

Since there is no value of the forest protection surfaces, it can be estimated the extension by applying the geometric formula of the areas of respect (minimum 200m upstream of the source with an amplitude of 90° - De Maio, 2013) thus reaching ha 14.608, equal to 2,3% of the forests alpine Lombardy.

In the Lombardy mountain provinces 12,269 river basins are present; among these 1,869 basins contain at least one point for drinking water (around 15%). Although some catchment points are not located directly in wooded areas, the catchment area of which it is almost always largely consists of forest stands. The contribution given by forests is therefore also relevant for those sources located outside wooded areas.

In the Province of Trento there are about 1.600 springs captured in forest areas, equal to 80% of the provincial total. The forest area present in all the Hydrogeological Protection Areas, therefore in the recharge areas of the springs, is equal to ha. 50.144, equivalent to 13.31% of the provincial forests (PAT, 2016).

The Province of Bolzano has about 2,000 springs collected for public use, which provide drinking water for 58% of the provincial needs (30 M mc / ha) and about 3775 sources for private use, which supply 4% of the total demand (Provincia Bolzano, 2017).

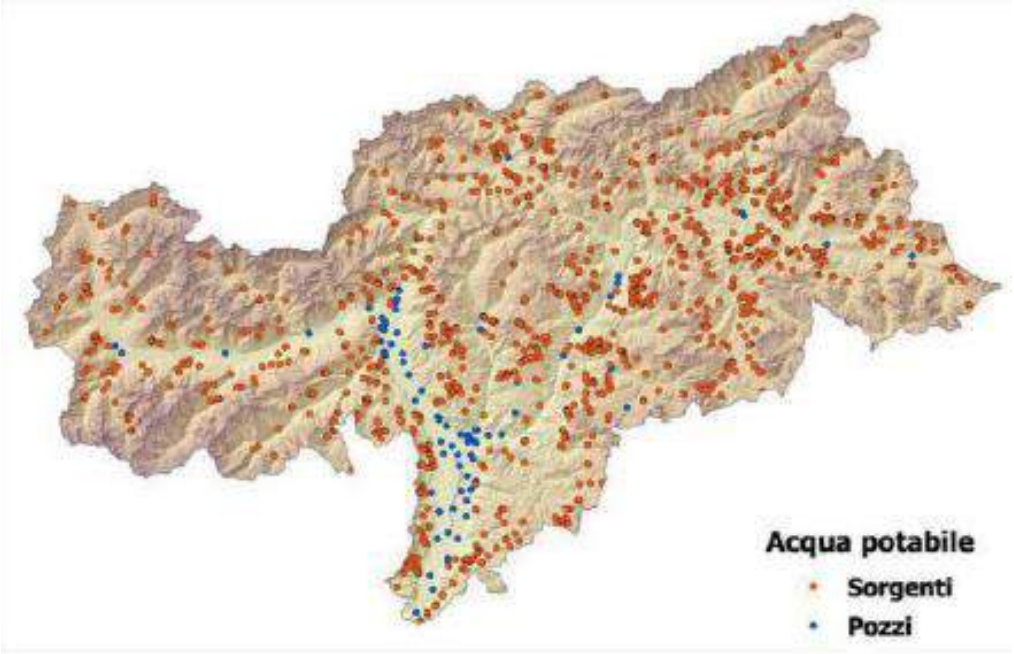


Figura 9 - Captation of drinking water in the Province of Bolzano

The protection area is quantified in 1,000 square kilometers, equal to 14% of the provincial territory

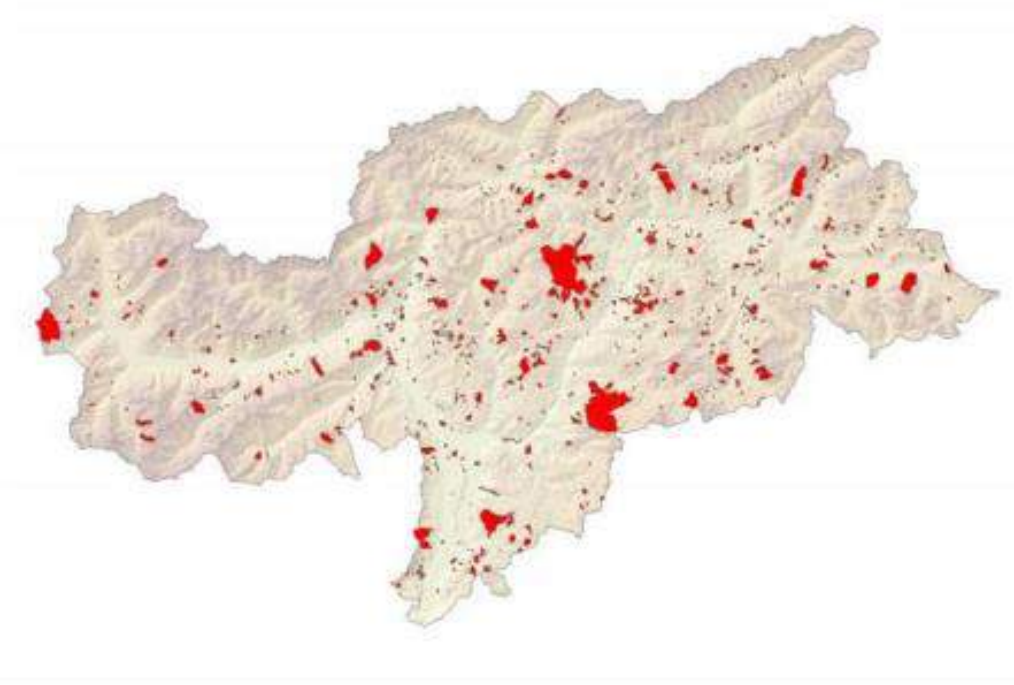


Figura 10 - Protection surfaces in the Province of Bolzano

In the Piedmont Region 4128 springs are registered in wooded areas, equal to 73% of the total, within the province of interest of the Convention, with a production of 125 M mc / ha (Regione piemonte,2003).

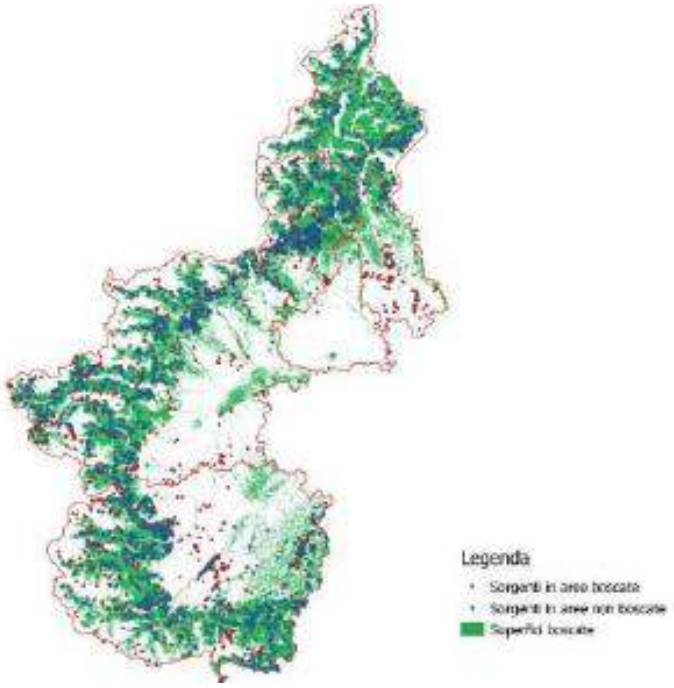


Fig. 11 - Identification of sources in wooded areas in Piedmont

According to data from the Sources Land Registry, in the Veneto Region 1256 springs collected for public use have been surveyed, of which 699, equal to 56%, in wooded areas.

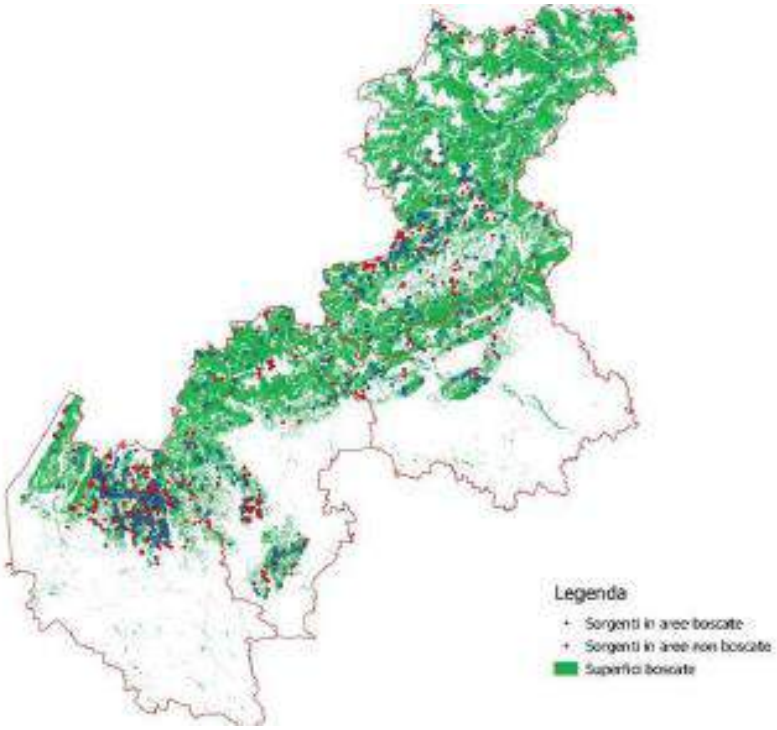


Fig. 12 – Identification of sources in forest areas in Veneto

In Friuli Venezia Giulia Region, according to data from the Regional Water Protection Plan (Regione Friuli V.G., 2018), 1,186 springs are registered, mainly in the mountain area, with a production of around 315 M m3/Y.

According to the mountain sources Registry of the DISGAM of the University of Trieste (2004), there are 2,400 springs, of which 600 are collected for public aqueducts.

Fig. 13 - Identification of sources in Friuli V. G.

In Valle D'Aosta the sources surveyed amounted to 1,700, of which 55 ° captured for civic aqueducts, with a production of 21.9 M m3 / year (Valle d'Aosta, 2007).

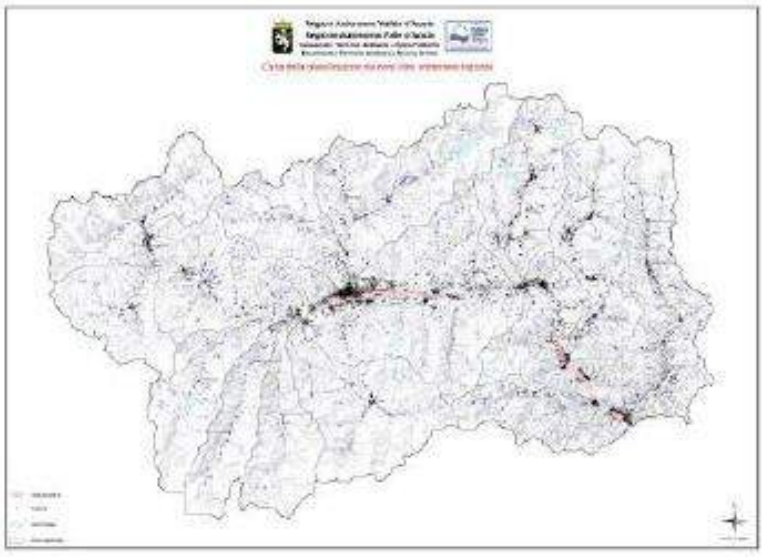


Fig. 14 - Identification of sources in Valle d'Aosta

In summary, the data are summarized as follows:

Regions	N. Sources	Production M mc/a	Cost € mc/a (4)	Drinking water forest protection area (ha)	% regional forest area
Valle d'Aosta	1.700	22	1,36	5.338 (2)	5,4
Piemonte	4.128 (1)	125	1,68-2,31	12.962 (2)	1,4
Lombardia	2.326 (1)	146	1,25-1,96	7.304 (2)	2,3
Veneto	699 (1)	271 (3)	1,52-3,40	2.195 (2)	0,6
Provincia Trento	1.533 (1)	48 (3)	0,77	50.144	13,31
Provincia BZ	5.775	32	1,19	24.178 (2)	7,2
Friuli.V.G.	1.186	315	1,36-1,90	3.724 (2)	1,4
Liguria	426 (5)	4 (5)	1,10	1.338 (2)	1,1
TOTAL	17.773	963	0,77-3,40	107.183	3,4

(1) Sources in wooded area
(2) Forest protection area calculated with the geometric method of the areas of respect
(3) Estimated data based on the average flow rates of the sources
(4) Data from "13 ° Survey by the Observatory prices and rates" of Cittadinanzattiva
(5) Data of the Municipalities of the territory of the Convention in the Province of Imperia

Austria

At national level, 39.39% of the surface of the drinking water protection areas is occupied by forests which, as a whole, represent ha 226,185, equal to 5.66% of the entire Austrian forest area.

55.34% of these protection forests consist of conifer formations.

The protection areas cover around 7% of the Austrian territory.

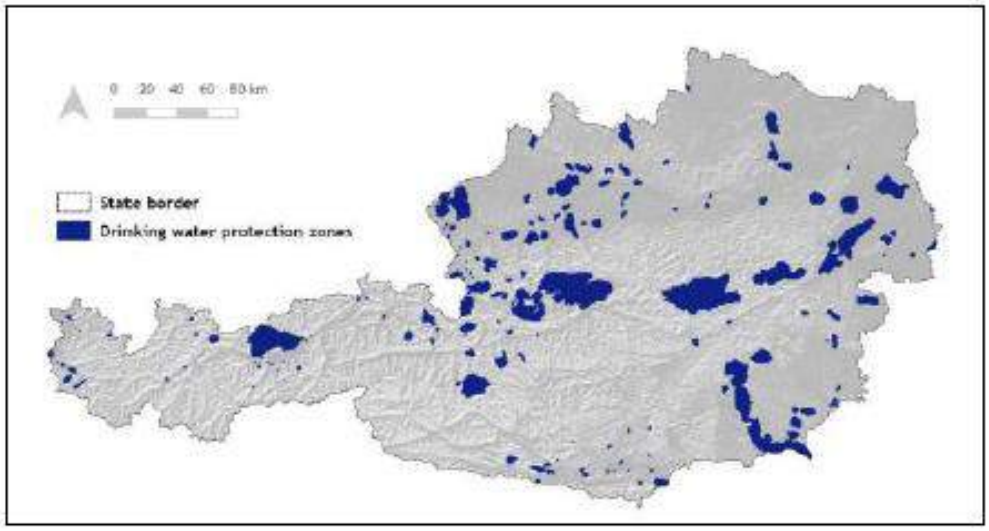


Fig. 15 – Drinking water protection zones (DWPZ) in Austria.

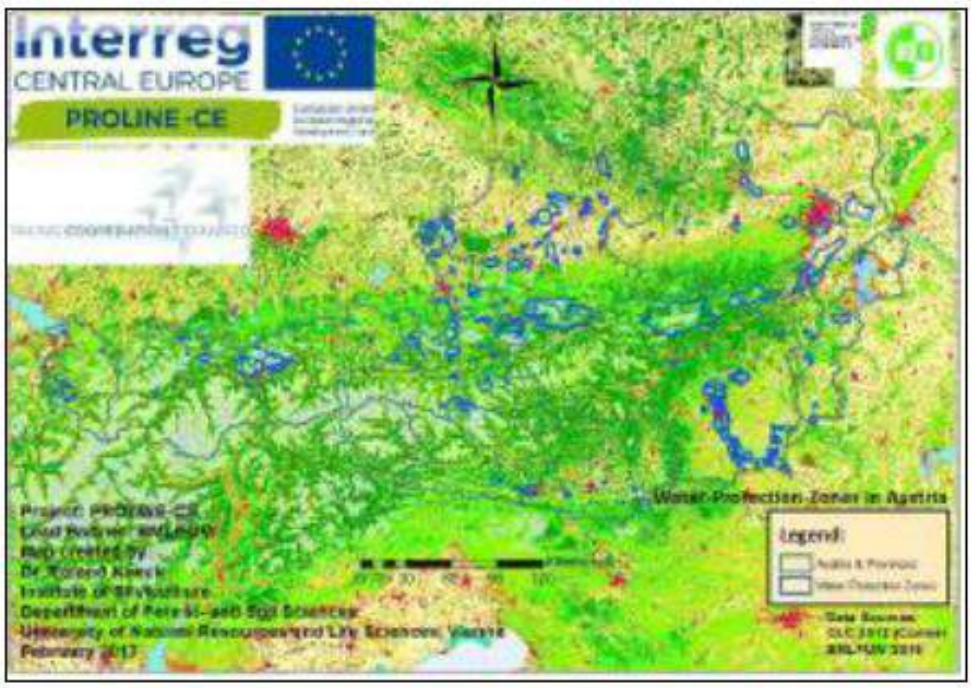


Fig. 16 - Water Protection Zones in Austria, displayed with Corine land cover data (CLC 2012)

From these sources, about 380 M m3 / year are produced, which represent 41% of the entire supply of drinking water.

The case of the city of Vienna is interesting: from 1873 drinking water comes from the basins located in the Northern Limestone Alps of Lower Austria-Styria, with about 380,000 cubic meters per day.

The watersheds, ranging from about 450 m to.s.l. up to 2200 m a.s.l, concern about 100.000 ha and are also used for the water supply of Graz - the second largest city in Austria - and numerous local communities.

In total over 2 million people are supplied with drinking water from this area.

Vienna thus finds itself in the unique situation of covering almost all its demand for drinking water from mountain springs; only a small part is obtained by means of underground water collection.

Fig. 17 - Drinking water production areas in the city of Vienna

In the Federal District of Styria, the city of Vienna created the "SpringWater Museum Wildalpen", with the aim of informing and making.

Germany

In the Lander Baden Wurttemberg and Bavaria, the production of drinking water from springs, generally located in the Alpine area, is equal to 110 M mc and 135 M mc respectively (Ludwig, 2016), corresponding to 13% and 15% of total production of the Landers.

The cost of drinking water is on a national basis between € 1.40 and €. 2.60 (https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2016/30_06_2016_Wasserbericht.html).

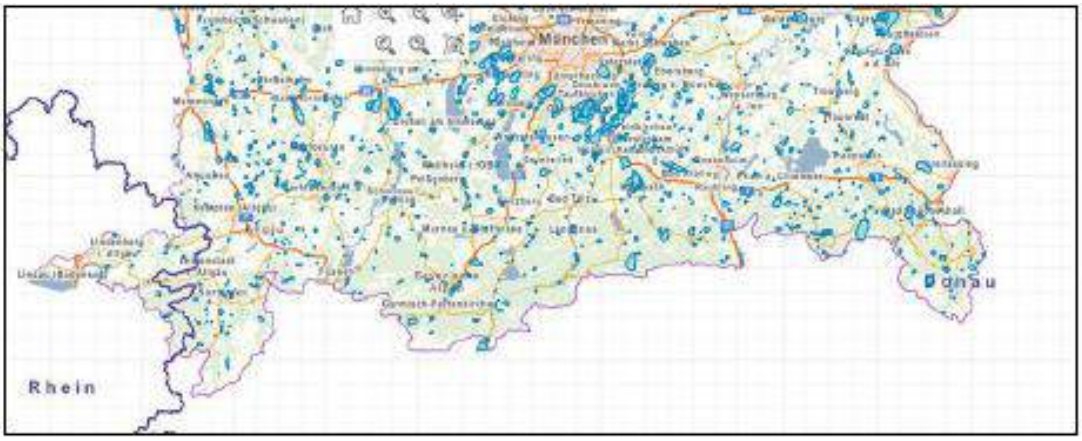


Fig. 18 - Drinking water protection zones in Bavaria and in the alpine region (Umweltatlas Bayern)

The case of the city of Monaco is interesting: drinking water, which supplies around 1.4 million inhabitants, comes directly from the Bavarian Alpine Highlands and in particular from the Mangfalltal valley, with a covered feed basin of over 1,800 hectares of forests providing a balanced hydrological regime.

The forest is managed by the Municipal Forest Administration (Städtische Forstverwaltung) on behalf of the municipal water supply company (Stadtwerke München, SWM) and is also certified in accordance with the Forest Stewardship Council (FSC). In the basin, since 1992, a process of conversion towards organic farming has been promoted throughout the river basin

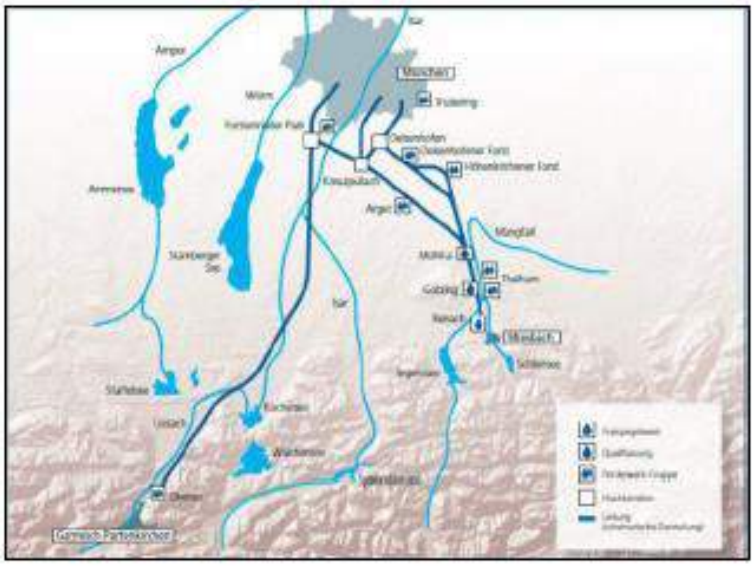


Fig. 19 - Production areas for drinking water in the city of Munich

Slovenia

In 2016 members of the Slovenian National Assembly adopted a proposal to enshrine the right to drinking water to the Constitution of the Republic of Slovenia by 64 votes in favor to none against. For this constitutional act to be adopted, two-thirds of constitutional majority in the National Assembly, i.e. at least 60 votes, were required. This makes Slovenia the second EU Member State, beside Slovakia, to protect the right to drinking water at the highest level.

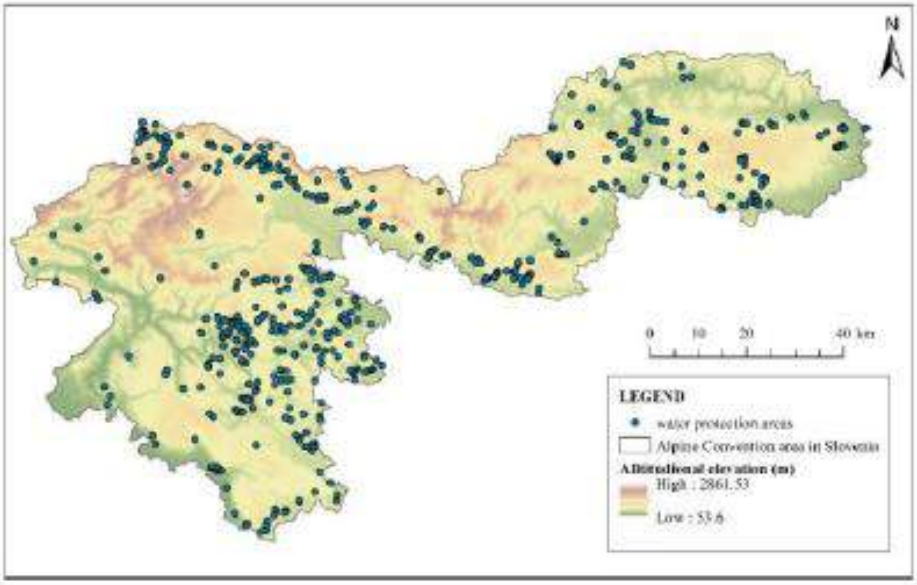


Fig. 20 - Distribution of water protection areas for water supply managed by Public services (also covers spare water supplies). Source: ARSO, 2013

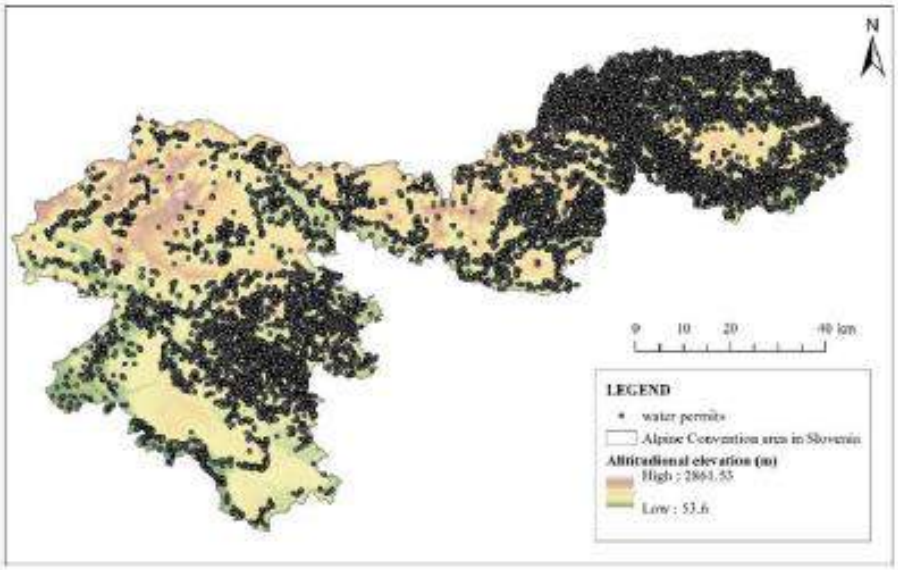


Fig. 21 - Distribution of water permits for own drinking water supply. Source: ARSO, 2013

The Figure 21 shows that the highest density of issued water permits for own drinking water supply in Alpine Convention perimeter in Slovenia is located in the Koroška region (southeastern part of the area) and in the Škofjeloško hribovje in the Gorenjska region (Škofjeloško hribovje).

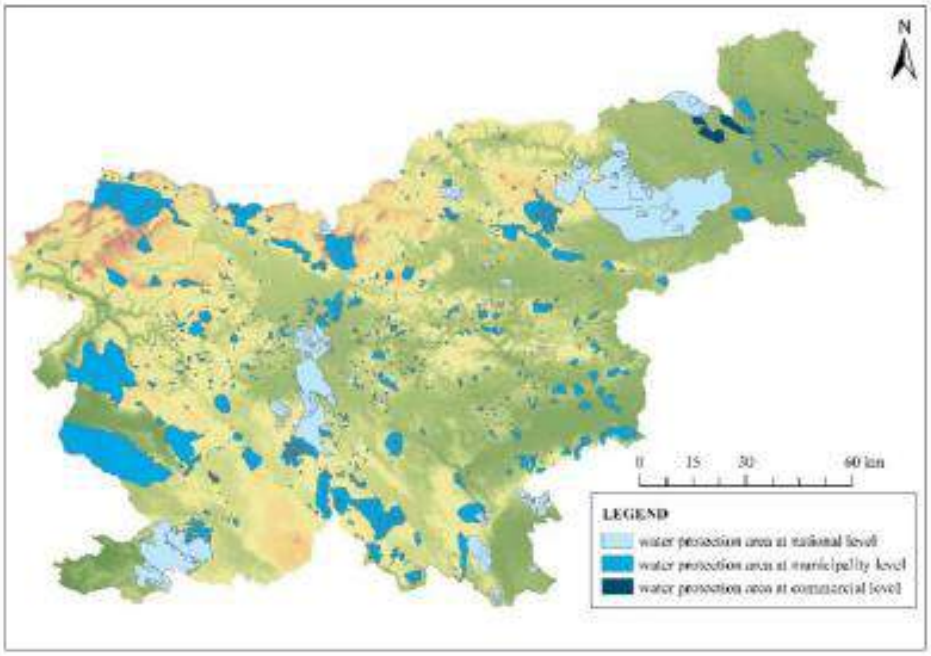


Fig. 22 - Water protection areas in Slovenia. *source: Water Directorate, Ministry of the Environment and Spatial Planning.*

Slovenian Water Atlas web browser

Slovenian Water Directorate created a completely refurbished water Atlas web browser. It is the first publicly available web browser to be installed on the state-owned computer cloud (SCC). In the renovated water Atlas is a graphical representation with the updated contents of the water cadaster and water rights. Metadata descriptions of data from the Water Directorate of the Republic of Slovenia are available on the Slovenian INSPIRE metadata system. Water Atlas web browser identifies that in the area of the Alpine Convention can be estimated about **656** water sources, of which 75% in the woods.

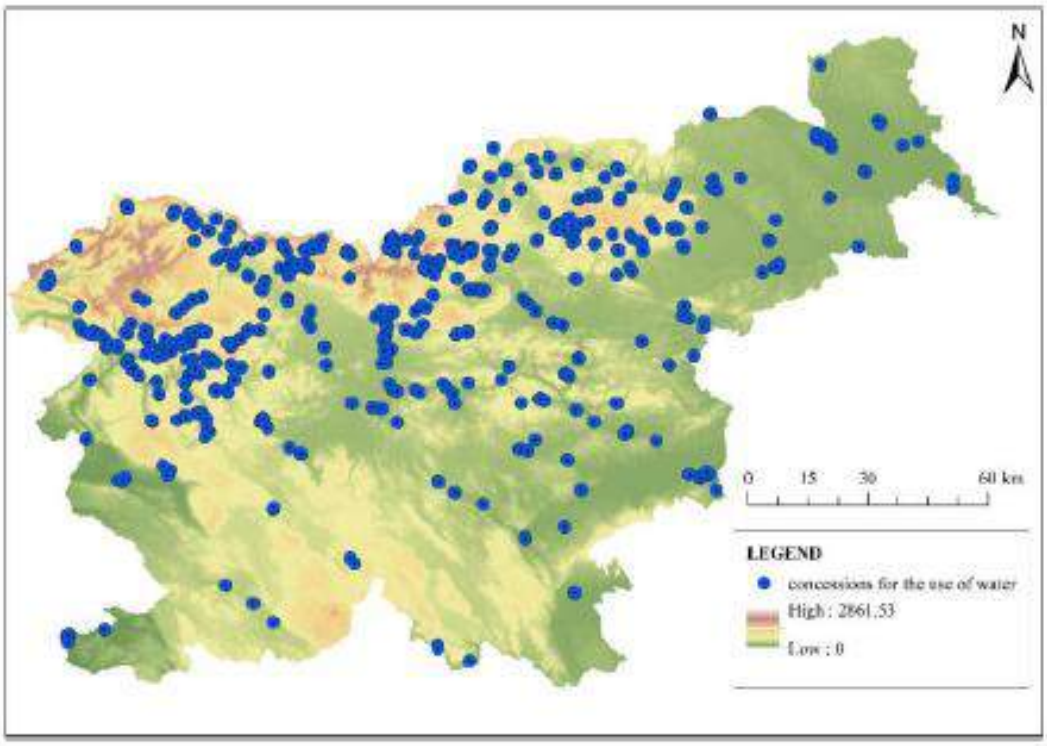


Fig. 23 - Concessions for the use of water. *source: Water Directorate, Ministry of the Environment and Spatial Planning, 27.07.2018).*

Water management in Slovenia in relation to key strategic program documents

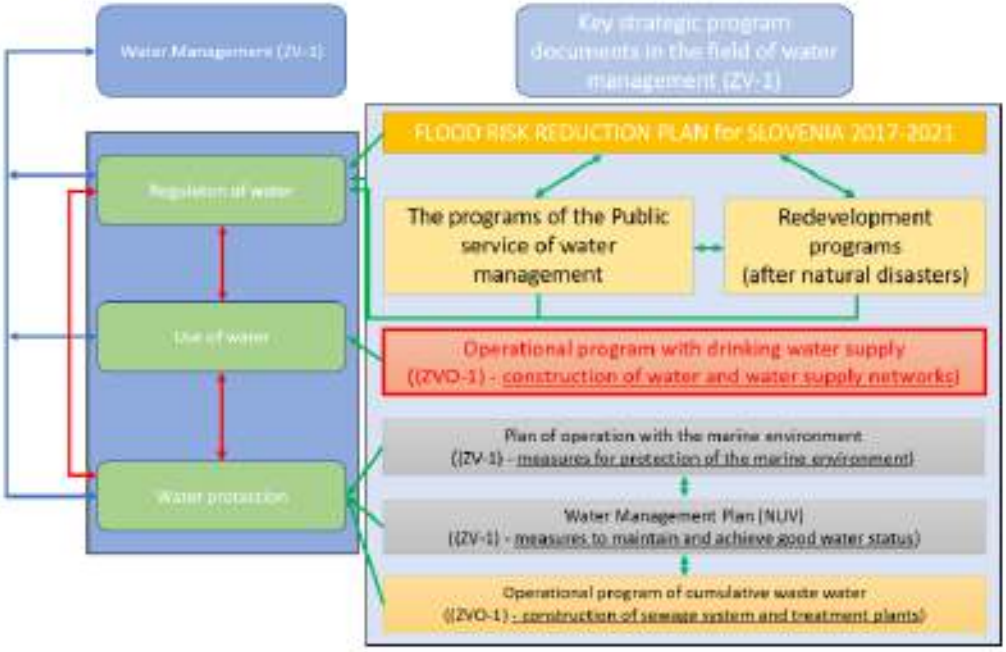


Fig. 24 - *Water management (regulation, use and protection of waters) in relation to strategic program documents in the field of water management (2017), Flood risk reduction plan for Slovenia 2017-2021, Ministry of the Environment and Spatial Planning, p. 262.*

Summary of data at alpine level

The summary of data at the Alpine level does not allow to have a complete data for the whole area and for all types of data.

Starting from the information reported in the paragraphs developed for each country, the general picture is represented as follows:

Country	N. of sources	Production M mc/y	Cost €. /mc	Protective forets area	% of total forest area (1)
France (1)	3.970	265 (3)	2,56-3,47	196.700	11,9
Switzerland	4.420 (4)	80 (5)	2	397.237 (6)	40 (6)
Italy (3)	17.773	963	0,77-3,40	107.183	4,3
Austria	3022 (10)	138 (11)	3,15	n.a.	n.a.
Germany	n.d.	225 (7)	1,40-2,60 (8)	1.800 (9)	0,4
Slovenia	656	n.a.	n.a.	n.a.	n.a.
TOTAL	29.675	1.671	0,77-3,47	709.290	13,2

(1) Forest area in the Convention area
(2) Data only for the departments of Haute-Savoie, Savoie, Isère, Alpes-Haute-Provence, Alpes-Maritime
(3) Data only for Departments of Haute-Savoie, Savoie, Alpes Maritime
(4) Data only for the cantons of Ticino, Valais, Graubünden
(5) Data for the Canton of Ticino only
(6) Data for all cantons
(7) Data for Land Bavaria
(8) Average data for Germany
(9) Munich protective surface data
(10) Data only for Tyrol
(11) Production data for the city of Vienna
n.a.: not available

What is possible to derive from this information?

Some ideas for observation:

- Not all countries have formal relationships and provide information dedicated to the theme of potable water protection by forest formations.
  Switzerland and France do so in their National Forest Inventories, but not in a homogeneous way.
  At the same time, the data collected by NFIs do not seem to be consistent with information that exists on a more local level, Departments in France and Cantons in Switzerland.
  Sometimes there are data for specific local realities, it is the case of the city of Munich that underlies large areas of production and protection in the Bavarian Alps of which there are good data, but no data were found for the entire Lander;

- Information on protective forests of drinking water often presents two non-contradictory data because they represent two different situations, but not always clearly integrated and correlated: on the one hand the value of forests that fall within the protection areas defined by law and regulations, on the other hand the value of the forests that go back to the entire feeding basins of the springs and outlets.
  It is the case, for example, of the data of the French NFI which reports at the national level has. 44,000 in total, but for the individual Departments of the Alpine area there is a value of ha. 196,700;
- The definition of the drinking water sampling points is not homogeneous between the countries and also in the regional levels: in particular the distinction between sources and between groundwater collection is not always reported;
- In the same way, the location of source or outlet points in the wooded area is not always available information among the various consulted relationships;
- Also, the value of the data related to the production of drinking water in the forest context, in the context of this relationship, must be considered carefully, since the methods for collecting information have not been detected in the various documents. These figures are therefore intended as an indicative estimate.
  Based on the data collected, it is possible to estimate an indicative production of approximately 2,500 M m3 /year.

Mineral water

The mineral sources are a typical production and a significant resource for the Alpine mountains, which produce important brands of high economic value.

On the whole, 169 brands are registered in the Alps as distributed by countries:

Paesi	N. producers	N. brands	Production mc/a	Value €./a	Cost €./l	Average consumption l./inab/y (7)
Francia (1)	9	9	4.026.000	1.541	0.98-7,72	136
Italia (2)	55	123	7.479.447 (a)	3.814 (b)	0,88-6,33	196
Svizzera (3)	14	22	n.a.	150	0,37-2,6	102
Germania (4)	3	4	n.a.	n.a.	0,61-2,4	144
Austria (5)	5	9	50.600 (a)	10 (b)	0.33-1,5	92
Slovenia (6)	2	2	n.a.	n.a.	n.a.	106
TOTAL	88	169	11.505.447	5.505	0,33-7,72	

(1) http://www.boisson-sans-alcool.com/marques_eau-france.html
(2) Bevitalia 2017-2018, (a) data on 31 producers (b) data on 30 producers
(3) http://eau-minerale.swiss/
(4) www.minerlwasser.com
(5) www.forum-minerlwasser.at, (a) data on 2 producers (b) data on 1 producer
(6) www.acqueinbottiglia.it
(7) https://www.efbw.org/index.php?classement=07 (2013)
n.a.: not available

The market data show that production and consumption, therefore also turnover, are continuously growing, with increases of 100% on a ten-year basis.

The available data reflect a market value of at least 4.000 M €. in Italy, 1.541 M €. In France, 150 M CH in Switzerland, for a total estimated production of the Alpine arc of at least 11.500 M cubic meters of bottled mineral water.

Italy and France, at the world and European top in the consumption of bottled water, are also due to the importance of production and the market with large quantities exported.

To give an account of the importance of Alpine mineral waters in the sector it is useful to highlight that in France the alpine sources belong to the first three groups that hold 80% of the market production (www.boisson-sans-alcool.com) and in Italy they are 4 the first market groups, with 51.8% of production, owners of the main alpine mineral sources (Bevitalia 2017-2018).

Compared to the altitude of the springs, almost all located under m. 1,800, it can be considered It can be estimated that 80-90% of Alpine mineral sources are in forest contexts, even if the relative protection surfaces are not known.

This fact, in many cases, is used by brands as an element of promotion and guarantee of water produced in natural places and therefore not contaminated, produced in a sustainable way and with high quality guarantees.

Fig. 25 - Examples of labels that recall the relationship with the world of nature and forests

The high market value could lead to the definition of territorial contracts to guarantee forms of payment of services provided by forests and / or for investments in the territory, to be eventually recovered as further *green appeal* during the marketing and promotion of the product.

This opportunity is made even more significant by comparing the different values that, on a European scale, are made by companies as concession fees for the research and exploitation of mineral springs:

Country	**Concession fee € / mc**
Italy	1,15
France	0,586
Germany	0,034

http://ricerca.repubblica.it/repubblica/archivio/repubblica/2018/01/02/la-minerale-non-disseta-i-comuni27.html

On the other hand, it may also be useful to remember that according to some studies (SSIGA 2015) the consumption of 142 liters of drinking water per person per day has the same environmental impact as the respective consumption of 0.3 liters of mineral water.

This topic could also be considered to promote, in addition to more sustainable production methods, also forms of compensation and / or return to the territory of the intense use of resources.

Water Protection areas are defined in all Alpine states: mostly as geometric or topographical borders in relation to the water sources. It is necessary to combine geological and topographical data to define actual protection areas and source feeding areas in order to effectively protect drinking water sources, that in all the Alpine area represent the most important provider of high quality and cheap drinking water. A clear and universally accepted definition of the protection and feeding source areas is the condition for the acceptance of payment methods of this essential ecosystem service.

3. Forest management for drinking water protection

Forest management has a direct influence on the quality of the water that percolates into the soil below the forest cover, thus affecting the water supply.
The choice of suitable silvicultural methods and policies suitable for basin scales help to create the best conditions for the production of water from the best quality and ideal water basins.

There are various contributions produced over time:

- AAVV (2012) - Protection des eaux souterraines en foret- Guide Alpeau dans l'Arc Alpin et Jurassien. Alpeau Project, Interreg.pg.37. www.alpeau.org
- AAVV. (2017) - Catalogue de mesures visant à garantir la protection des eaux souterraines en milieu forestier. Project Interreg ALPEAU 2008-2012. Pg.30
- Bansept A., Fiqueperon J. (2014) – Protéger e valorosirer l'eau forestière. Guide pratique nationale. Programme "EAU+FOR". Pg. 164
- Forstwegebau und Holzernte im Wasserschutzgebiet (2014)- Bayerisches Landesamt für Umwelt – Merkblatt Nr. 1.2/10.
https://www.lfu.bayern.de/wasser/merkblattsammlung/teil1_grundwasserwirtschaft/doc/nr_1210.pdf
- Del Favero R. (a cura di) (2000) - Direttive per i piani di gestione delle proprietà forestali nella regione Friuli-Venezia Giulia. Regione Friuli V.G. pg.256
- Koeck R., Magagna B., Hochbicler E. (2007) – Best Management Practices for the drinking water protection forests. Appendix I KATER II Project. University of Natural resocurces and Applied Life Sciences, Vienna.p.34
- Koeck R., Hochbicler E. (2014) - Best Practices for Forest Ecosystems in Mountains and Flatlands. Appendix WP 4 CC-WARE Project, South East Europe pg. 68. www.ccware.eu
- ONF, Volvic, CRPF d'Auvergne (-) – Guides des bonnes pratiques sylvicoles sur l'impluvium de Volvic. Life Semeau. p. 16.

The various studies conducted, and the various product management manuals agree that the following practices are significant:

Forest management guidelines for drinking water protection

- Promoting mixed forests and, in general, mixed stands with high amounts of broad-leaved trees and silver fir: with the loss of the leaves in autumn, these woods allow a greater infiltration, filter less nitrogenous substances present in the atmosphere.

Moreover, generally having a deeper root system, they fix larger quantities of nitrates in the soil. Finally, the humus of broad-leaved trees is biologically more active, improving the filter effect and the buffer effect on the water.

- Providing controlled and limited extension forest cuts: in the protection zones the cuts should be according to the selection system, but also in the catchment basins of drinking water should be preferred a continuous and non-intensive treatment, aimed to establishing uneven-aged-stands.

In the mountain area this model can be configured as “shelterwood selection system" with a maximum size of 5.000 square meters (www.life-semeau.eu; Koeck, Magagna, Hochbicler, 2007).

Fig. 26 - *Mountain forest managed under the shelterwood selection system*

In fact, cuts too large the risk of creating phenomena of excessive mineralization of humus and nitrate run-off, as well as risks of increased turbidity as a result of the elimination of the grassy and shrubby layers with soil denudation.

In addition, extended cuts require the construction of roads or forest tracks and the logging of the logs with soil denudation and still risk of turbidity of groundwater.

All cuts in the catchment areas of respect must be authorized and checked.

- Adopting biological lubricants for the use of machines and equipment: these products are to be preferred in the management of the drinking water protection forests, since one of the main risks for forest management is the spillage of hydrocarbons.

In the same way, the wood fuel storage and the means of recharging the equipment’s must take place in protected conditions.

Ensuring the presence, in work sites, of absorbing materials to intervene in case of accidents with oil and fuel leaks.

-Adopting suitable logging methods for the sites, the characteristics of the soils and the moments of heavy rain (with the limitation of the use of heavy vehicles and machinery in the areas near the catchments), to avoid risks of compaction on the one hand and erosion other with subsequent turbidity of the waters.

-Avoiding the use of pesticide products, insecticides or fungicides, also to treat the felled timber.

This should be set up in areas outside the feed basins or on waterproof substrates.

The Interreg CE project "PROLINE-EC" has developed a "Transantional best management practice report", which accurately describes the different measures applicable in the forest environment and the relative advantages and limitations, also identifying specific practices for each practice (www. interreg-central.eu/Content.Node/PROLINE-CE.html).
An example is shown in Fig. 27.

Table 2. Best management practice relevance - Forests

Best management practice	Water protection functionality	Cost of the measure	Duration of implementation	Time interval of sustainability
MOUNTAIN SITES				
Avoidance of the clear-cut technique*	High	Low	Long Term	Long Term
Establishment of a Continuous Cover Forest System*	High	Medium	Long Term	Long Term
Defined Crown Cover Percentage of Forest Stands*	High	Medium	Long Term	Long Term
Limitation of the Percent-age of Timber Extraction*	High	Medium	Long Term	Long Term
Continuous Regeneration Dynamics*	High	Low	Long Term	Long Term
Foster Stability, Vitality and Resilience of the Forest Ecosystems*	High	Low	Long Term	Long Term
Tree Species Diversity According to the Natural Forest Community*	High	High	Long Term	Long Term
Improve the structural diversity of the forest stands*	Medium	Medium	Long Term	Long Term
Forest Ecologically Sustainable Wild Ungulate Densities*	High	Medium	Long Term	Long Term
Protection of the Gene Pool of the Autochthonous Tree Species*	High	Medium	Long Term	Long Term
Foster old, huge and vital tree individuals*	High	Low	Long Term	Long Term
Establishment of an adequate deadwood management*	High	Low	Long Term	Long Term
Buffer Strips along Streams, Dolines and Sinkholes*	High	Medium	Long Term	Long Term
Adaptive Forest Management under Climate Change*	High	High - Medium	Long Term	Long Term
Natural Forest Succession in Case of Stable Forest Ecosystems*	High	Medium	Long Term	Long Term
Small-Scale Regeneration Techniques*	High	Low	Long Term	Long Term

Fig. 27 - Good forest practice framework drawn from the "PROLINE-EC" Project Forestry guidelines

Other operational indications are illustrated by the Alpeau Project in the report "Protection des eaux souterraines en foret- Guide Alpeau in the Arc Alpin et Jurassien" (www.alpeau.org).

The "Orientgate" project has elaborated a Water Protection Functionality Index (WPFI), which allows to represent the contribution of a forest ecosystem to the supply of the "drinking water" ecosystem service (DWP), understood as' supply of high quality drinking water in adequate quantities" (http://www.orientgateproject.org/uploads/Press%20releases/results%20docs/pilot%20study%20reports/WP4_Pilot%20Study%201_Report_WEB.pdf).

Forest ecosystems can provide a high level of DWP if they are treated according to specific guidelines for areas protected by drinking water. This requires adaptive forest management at all levels of silvicultural interventions, as indicated in "Recommendations for Adaptive Management Concepts" (Koeck and Hochbichler 2014).

If inadequate forest management practices are applied, water protection functionality can be reduced, in some cases even destroyed.

For the evaluation of WPFI in the pilot study area of the available project, three parameters were used in a specific simulation model: (1) the silvicultural technique applied in the area, (2) the specific composition of the ground and (3) the regeneration dynamics, considered as the most important for the definition of WPFI of a forest area.

WPFI is calculated as a normalized value of the three forest parameters applied.
High water protection functionality is expected if WPFI is between 0.8 and 1.0, a very low WPFI value between 0 and 0.29 indicates that the water protection functionality of a forest is actually very low:

WPFI Value	0.8 – 1.0	0.5 – 0,79	0.3 – 0,49	0 – 0.29
WPFI Indication	high	medium	low	very low

General guidelines

- To integrate forest management documents (Management plans, Regulations, contracts) with specific attention to the management of forests for the protection of drinking water resources.

-To ensure correct forest management not only in protected areas of catchment areas and also throughout the feed basin, through the adoption of forest management and logging practices aimed at protecting groundwater.

-To activate modalities and moments of dialogue and comparison between forest authorities, foresters and local water management companies, to share appropriate forest management solutions.

-To promote, starting from significant experiences already underway, forms of remuneration of the function of protection of drinking water, between public entities, forest owners and water companies.
In particular, the compensation for the higher costs required by the specific methods of silvicultural management should be distinguished from the remuneration of the real water supply service.

-To promote public and consumer awareness actions and activate training actions for water services managers and forest managers.

-To remember the clause for the protection forests and their proper management in the tenders of forest works assigned to the companies.

4. Some considerations

Costs and benefits

The careful management of forests in the areas of drinking water protection is a cause of costs higher than ordinary management.

These can be referred to the need to adopt less intensive methods of cutting and logging, with limitations to the opening of forest roads, or the need to make it farther away, with lighter operational means of transport, with the suspension of working time in periods of strong rain and soils impregnated with water; or for the need to use ecological mixtures and oils for machines and tools; or for the most accurate cleaning and removal of branches and wood residues.

According to the authors, these higher costs range from €. 33/ha/y at € 75-100/ha/y in France (with an incidence of € 0,04 to 0,07/mc of water) (Fiquepron J., 2012), from CHF 9/ha/y to CHF 300/ha/y in

Switzerland (Burgi A., Spjevak S., 2009), with 500-1.000 €/ha for forest improvement and increase in the presence of deciduous trees in coniferous forests.

Some studies also highlight the value of benefits derived from the presence of forests for the protection of drinking water, which do not require specific treatments.

In Switzerland, the water treatment cost of 0,20 CHF/mc is reported to water purification, which would result in a saving of 80M CHF/year on the quantity of drinking water coming from springs (UFAFP, 2005).

In France it has been estimated that the cost of withdrawing water from sources in the forests is 4 times lower than the cost of groundwater uptake and is less than 26 to 60 times the cost of pumping water from the lakes (Fiquepron J.,2012).

The non-treatment of water thus allows a savings estimated on average in €. 0.44 / mc (Fiqueperon et Picard, 2010).

Remuneration services

Today the principle of compensation for forest management is a necessity recognized by many subjects and begins to be so also in different national regulations.

However, its modalities must be implemented through new regulations or contractual forms, which must find the sharing and participation of the parties in the explicit and formal definition of the roles managed and of the recognized goods and services.

It is possible to imagine two opportunities:
- To integrate economic compensation in the context of forest water collection procedures;
- To remunerate the services provided by forest management.
Several experiences have already been carried out in Europe, in the United States, in Australia (Pettenella, Secco, Ravanelli, 2006; Deck, 2008).

For example, in France, the protection service provided by new afforestations on agricultural land is estimated at 15 €/ha/y. In the municipality of Saint-Etienne (F), the private water management company has signed an annual agreement with ONF worth around € 30.000/year for technical management and small forest protection measures for forest springs. The Inter-communal Water Syndicate of Moises (SIEM) in France, on the lakeside of Geneve, has supported the establishment of an association of forest owners to facilitate the correct management of 150 ha of protection forests, guaranteeing compensation for higher costs and financing a flat rate of € 1.000/ha to support the transformation of forests into irregular mixed forests.

In the Volcic mineral water production region, the Danone property pays compensation to municipalities and private owners from €. 300/ha/y to € 1.200/ha/y, up to a maximum of € 3.000/ha/y, for restrictions on use.

Also, in France, a study in the Nancy area has verified the willingness to pay €. 50/y more for families to have "natural" water of forest origin (Fiquepron coord., 2010).
The investments of Vittel and the city of Munich to reforest agricultural land in the catchment areas are worth respectively €. 0,0154 and €. 0,00006 per bottle produced.

An approximate estimate of 1% /mc on the average value of drinking water (€ 2.5/m3) and 0,1% for minerals waters (€ 1/l.) could guarantee the management of water protection forests something like 62,5 M €/year for drinking water and 800 M €/year for mineral water.

It is certainly pending, given the regulatory difficulties in some cases or the operational difficulties in others, the assessment between the choice to leave the contract between the two contracting parties for the payment of the ecosystem services, or to entrust the government public the remuneration of the costs necessary for the management, recognizing the service offered a high public good value.

Quality brands

The good quality of the water of forest origin can constitute a positive image for the forests as well as for the producers.

The aim of the quality label is to improve the value of the forest in supplying consumers with good quality water.

In particular, the brand, in addition to valorise the quality of the water supplied to the consumer, enhances the important social value of the forest, the role of the person managing it, the action of the service companies, and finally the quality and value of the territory, managed in a sustainable way.
The mark can also serve as an instrument of recognition and guarantee to attribute any overhead management costs on the tariffs.

Fig. 28 - Examples of a Swiss brand

The quality label can also today be supported by the new and specific FSC forest certification standards, which have recently foreseen the possibility of certification of eco-system services, including those relating to the so-called "basin services" inherent, among others, the use of water for domestic use.

Hydroforestry policies

It is recognized that technical water treatment is much more expensive than water filtered through forest ecosystems.
Therefore, it is quite reasonable therefore to support a specific good policy for the conservation of the drinking water resources provided by forests.

Not all the world of forest managers nor that of water services is fully aware of the need to adopt specific strategies and methods for the management of production of drinking water from forest areas.
It therefore appears necessary to promote better awareness at different levels and adopt appropriate ways to promote good policies:
- To integrate water and forest management in the Territorial Plans
- To identify forest areas for the protection of aquifers in forest planning;
- To promote territorial agreements or contracts between the various parties involved in forest management and water services.
An agreement was concluded in the Haute-Savoie between SIEM and an association of forest owners for the protection of catchments within the forests.
The agreement provides for the drafting of a management plan, the drafting of a tender for forest uses with the recognition of higher costs, the realization of works for forest roads.
- To orient the legislation towards a clearer and fair recognition of the value of forest management for the protection of drinking water resources.

5. Conclusions

The forest management exerts a considerable influence on the quantity and quality of the percolation water and consequently also on the drinking water in the catchment basins.
This is an important service in providing quality drinking water without particular treatment needs.
The natural origin of the water allows it to offer consumers the guarantee of a quality product, a theme on which today's attention is maximum.
Forest ecosystems guarantee the constant supply of good quality drinking water for populations and tourist presences.
Public institutions, forest authorities, water management services, local municipalities should be aware of the role that forest ecosystems play in guaranteeing water resources and taking shared actions for the protection of springs and good forest management of the protection areas.

AA.VV. (2012) - Protection des eaux souterraines en foret. Projet Alpeau.

Beverfood (2017) - Bevitalia 2017-2018. www.beverfood.com

Burgi A., Spjevak S. (2009) - Grundwasserschutz im Wald kostet! Wald und Holz n.2/09 pg. 30-33. https://www.waldwissen.net/wald/boden/wsl_grundwasserschutz/wsl_grundwasserschutz_originalartikel.pdf

CRPF PACA (2012). Working Report on ecosystem services that Mediterranean Forests provide in the water issue. SYLVAMED

Deck C. (2008) - Forest management and drinking water: Case studies and recommendations. Institute of Silviculture Department of Forest and Soil Sciences University of Natural Resources and Applied life sciences Vienn.131 p.

De Maio M., Ghione R., Suozzi E., Amanzio G., Crepaldi S. (2013) - Linee Guida per la delimitazione delle aree di salvaguardia delle sorgenti montane. Progetto Interreg STRADA. http://www.progettostrada.net

Fiquepron J., (2012) - Étude technico-économique sur le site de Moises-Forchat – E'valuation du service rendu par la foret pour la production d'eau potable. CNPF-IDF – SIEM – Alpeau, 79 p.

Fiquepron J. (coord.), Charnet F., Garcia S., Stenger A., Wilhelm N., Formery M, Persuy A. (2010) – Foret et eau potable, des services à mettre en valeur. Dossier Foret entreprise n. 193, p.11-42

Flood risk reduction plan for Slovenia 2017-2021, Ministry of the Environment and Spatial Planning, p. 262.

Foret Entreprise (2014). L'eau forestière. N. 219

ForestSuisse (2016) – Foret et eau potable. Mars 2016. www.foretsuisse.ch

Greiber T., van Ham C., Jansse G., Gaworska M. (2009). Final report study on the Economic value of groundwater and biodiversity in European forests. CEPF, IUCN.

Hamilton L.S. (2008). Forests and water. FAO

Koeck R., Magagna B., Hochbicler E. (2007) – Best Management Practices for the drinking water protection forests. Appendix I KATER II Project. University of Natural resocurces and Applied Life Sciences, Vienna.p.34

Koeck, R., Hochbichler, E. (2014). Appendix 1 – Recommendations for Adaptive Management Concepts – Best Practices for Forest Ecosystems in Mountains and Flatlands. www.ccware.eu under Output Documentation, WP4.

Ludwig R. (2016) – Water supply and sources water protection in Munich, Germany. https://rv-eau.ca/wp-content/uploads/2016/11/Ludwig-Munich-Drinking-Water-Supply-Quebec-City-01-Nov-2016.pdf

Maitre V., Jenni R. (2007). Etude bibliographique sur la relation foret-eau souterraine.

MCPFE (2007). Fifth Ministerial Conference on the Protection of Forest in Europe. Forests for quality of life. Resolution 2 Forests and Water. Warszawa, Poland.

National Operational Program for Drinking Water Supply in Slovenia 2015 – 2020 (Ministry of the Environment and Spatial Planning), date 14.8.2018

ONF, Volvic, CRPF d'Auvergne (?) – Guides des bonnes pratiques sylvicoles sur l'impluvium de Volvic. Life Semeau. p. 16.

Pettenella D., Secco L., Ravanelli G. (2006) – La stima del valore del servizio idropotabile offerto dalle risorse forestali. In: E. Basile, C. Cecchi (a cura di). Diritto all'alimentazione, agricoltura e sviluppo. Atti del XLI Convegno di Studi Sidea. Franco Angeli, Milano, p. 682-701.

Provincia Autonoma di Trento, Agenzia Provinciale per le risorse idriche e l'energia (2016). Osservatorio dei servizi idrici.

Provincia Autonoma di Bolzano (2017) – Piano generale di utilizzazione delle acque pubbliche.

Regione Friuli V.G. (2018) - Piano Regionale di Tutela delle Acque

Regione Lombardia (2006) – Programma di Tutela e Uso delle Acque

Regione Piemonte (2003) – Sistema Informativo risorse idriche

Regione valle d'Aosta (2006) – Piano di Tutela delle Acque

Regione Veneto – www.regione.veneto.it/web/ambiente-e-territorio/geoportale

Revue Forestière Francaise (2006) - Eau et foret. N. 4

SSIGA (2015). Rapporto settoriale dell'approvvigionamento idrico in Svizzera. Zurigo. pp.40

UFAFP, WSL (ed.) 2005: Rapporto forestale 2005 – Cifre e fatti sullo stato del bosco svizzero. Berna, Ufficio federale dell'ambiente, delle foreste del paesaggio; Birmensdorf, Istituto federale di ricerca per la foresta, la neve e il paesaggio. 154 p.

Sitography

www.alpeau.org

www.bafu.admin.ch

www.eauxfrance.fr

https://map.geo.admin.ch

www.mineralwasser.com

www.life-semeau.eu

www.interreg-central.eu/Content.Node/PROLINE-CE.html

www.trinkwasser.ch

www.vdm-bonn.de

www.waldwissen.net

Good Practice Template

WG Report

"Interdependence between mountain forests and freshwater provision" 2018

Planning tools for the sustainable management of forests for the protection of drinking water sources Title	Planning tools for the sustainable management of forests for the protection of drinking water sources
Reference	Activity carried out during the years 2004, completed but not activated due to the different restructuring processes of the company.
Country, Region	Bergamo, Lombardia, Italy
Specific objective	To provide the company responsible for drinking water in the city of Bergamo with the specific tools for knowledge, protection and enhancement of forest stands for the protection of springs.
Localization	Sub-regional territorial location
Bodies involved	Uniacque s.p.a as owner of the aqueducts for the City of Bergamo (formerly BAS); ERSAF as regional authority for forest services; TESAF of the University of Padua for scientific support
Abstract	Uniacque s.p.a manages the water service for 172 municipalities in the province of Bergamo for a total of 820,000 inhabitants, using 575 units, mainly sources present in the pre-Alpine belt near the plain. Among these the city and the hinterland of Bergamo with about 225.000 inhabitants, that consume approximately 220 l / inhabitant / day. The supply to the city is guaranteed in particular by the Nossana spring, about 30 km away in Valle Seriana, at an altitude of 480 m. This is a karst source with an average annual flow rate of 3,000 l / s, which, according to the latest studies, has a hydrogeological basin of 80 sq. Km. Considering that most of the springs are in the forest context, during the early 2000s Uniacque provided, through ERSAF, a specific management plan for forests for hydroprotective purposes. Subsequently, only for the area of the source Nossana has started a series of studies to identify, even as a pilot case internally, modalities, critical issues and opportunities for a correct management of the territory for the protection of water. The collaboration between Uniacque, ERSAF and the University of Padua has therefore produced a series of studies and working documents useful for the sustainable management and enhancement of natural resources in the context of water management activities.
Actions, measures	**a. to. "The forest and the protection of water resources in Val Nossana".** In this first phase a description was made of the main elements that make up the landscape of the valley: the use of the land, the survey in the field of forest resources, the alpicultural activity, the presence of mines and the proposal to establish a park mining. Evaluations have been made on concentrated and dispersed recreation, in relation to the risks these activities entail for water resources, the role of forests in the protection of land and water resources, identifying good forest management practices for the entire hydrogeological basin . The areas managed by Uniacque have a central role in the protection of water resources due to their proximity to the source, and through the ground and the forest cover they perform a filtering action on rainwater and control surface and subsurface outflows that develop in site. On the other hand, they are not able to influence the deep runoff routes of the water, originating upstream: in this case they can only guarantee protection from possible sources of pollution, while they can not exert an improvement action on

water quality. These practices concern the different aspects of the anthropic action on the forest: forestry, fire, fertilization, use of herbicides and pesticides, thinning and conversion, forest utilization, removal of branches, cimals and cutting residues, logging, construction of storage, use of oils and fuels, construction of roads and forest tracks, grazing and creation of buffer strips.

b. Hydrological balance of the feeding basin and quality of the waters of the Nossana spring.

Based on the analysis of available hydrometeorological data, it was assessed as a working hypothesis that the feeding basin far exceeds the one identified by the watershed: it was thus possible to estimate a real area between 60 and 70 sq. Km, compared to 24- 25 considered up to now. In the balance equation applied to the topographic basin, a U-size was introduced relative to the underground contributions of the neighboring basins equal to twice the P rainfall affecting the basin. The presence of numerous measurement limits and the lack of available data do not allow a precise definition of the real extent of the feeding basin. This fact suggests an analysis of the underground run-off routes (for example, using tracers) as possible development of the survey, in order to set up an effective water resource protection strategy
based on a correct management of the use of the soil

c. Economic estimate of the value of the forest in relation to the protection function of the water resource.

Methods of economic estimation have been applied to the hydrogeological protection function carried out by the wooded formations. These estimates concerned both the entire hydrogeological basin and the single zone of respect, from which the values for each unit of surface area and per cubic meter of water supplied were obtained. There were two lines of assessment: that related to land use (for example the cost of construction and management of a forest or the estimate of additional costs due to the predominantly protective function of the forest and the application of good forest management practices)) and that related to drinking water (for example the market value of the water resource or the capitalization of the water production function). The values thus obtained cover a very wide range (from a minimum of 10 to a maximum of 36,500 € per ha). This remarkable variability is to be referred to the different estimation criteria that can be used in relation to the different economic aspects of the asset that are intended to be privileged. In general, it is possible to prefer in principle the estimates directly linked to the production of water as they are not influenced by other cost or benefit components such as landscape value. In particular, the costs of subrogation and treatment of polluted waters are significant, ranging between 0.1 and 80 € / mc. However, in the light of the values obtained, two important conclusions emerge:
based on even the most restrictive estimates, it appears that the costs of a good management of the catchment area are widely justified;
according to the precautionary principle that should guide the management of the water resource, the highest results of the estimates should also be considered. The case of negative events that influence the availability of water, as related to a low probability of occurrence, and the costs that derive from it, must be concretely taken into account by the operator.

d. Activation of environmental certification procedures for forest resources.

A feasibility study was carried out on the forest certification of the wooded areas managed by Uniacque. The objective is the activation of a certification process of

	good forest management in relation to the hydrological protection function. The certification of the SLIMFs pilot project (Small and Low Intensity Managed Forests), initiated by the Forest Stewardship Council International, was therefore proposed. This project is in fact aimed at two types of forest resource that were up to now excluded from the normal areas of certification: forests of small size and those where the production function is not a priority. On the basis of the FSC requirements, it emerged that no significant changes to the management criteria are necessary, confirming the validity of the silvicultural practices implemented up to now, but that some procedures, such as stakeholder consultation, and some elements need to be included ex novo to be perfected, such as the preparation of some written procedures and the methods of monitoring the source protection areas.
Period	
costs	Any reference to the costs incurred if known
contact	giovanni.ravanelli@ersaf.lombardia.it laura.secco@unipd.it davide.pettenella@unipd.it
Bibliography/ documents	Pettenella D., Secco L., Ravanelli G. (2006) – La stima del valore del servizio idropotabile offerto dalle risorse forestali. In: E. Basile, C. Cecchi (a cura di). Diritto all'alimentazione, agricoltura e sviluppo. Atti del XLI Convegno di Studi Sidea. Franco Angeli, Milano, p. 682-701. http://www.uniacque.bg.it
Notes	At the moment, while the forest management activities continue, according to the specific indications of the management plans, the certification path has not been activated due to the different changes in asset management interventions in recent years
Cartography	

Interactions between mountain forests and flood protection


1 Contribution of protection forests for prevention of floods

1.1 Effects of forests on flood prevention

Forests play an important role in the regulation of water runoff. This applies especially for the alpine region with its high amount of precipitation and its steep slopes. But many factors do influence the processes of water runoff. Therefore the interrelations are rather complex. Important factors of the influence of forests on floods are

- the evaporation (interception and soil evaporation),
- the amount of consumption of water by the vegetation (transpiration) and
- the effects of forests on the retention of water in the soils.

The evaporation of forests is in general higher than of other forms of land use. By means of their huge surface tree crowns have a high interception. The effect of interception is higher for coniferous trees than for broad-leaved trees and is also effective during the winter if the coniferous trees are evergreen (Markart, 2016). With reduced percentage of crown cover the effect of interception by the tree crowns is decreasing but it can partly be compensated by ground vegetation (young trees, shrubs).

The older forests are, the higher is their consumption of water. In general the transpiration of coniferous tree stands is higher than that of broad-leafed tree stands. With the increasing number of mild winters the transpiration effect of coniferous trees is rising.

The retention capacity of soils also plays an important role for hydrologic budget. Because of their higher infiltration rate and retention capacity forest soils can store more water than most other soils (bare, pastures, agriculture). One reason is the higher transpiration of the trees which leads to a higher percentage of free soil pores under forest cover (Markart, 2016). Furthermore forest soils have a higher root penetration, a more porous structure and higher contents of humus, which also improve the pore volume and the retention capacity of the soils. Müller (2017) reports important

differences in the storage capacity: in mixed structured forest the average storage is 140 l/m² while in degraded spruce forest it is reduced to 60 l/m².

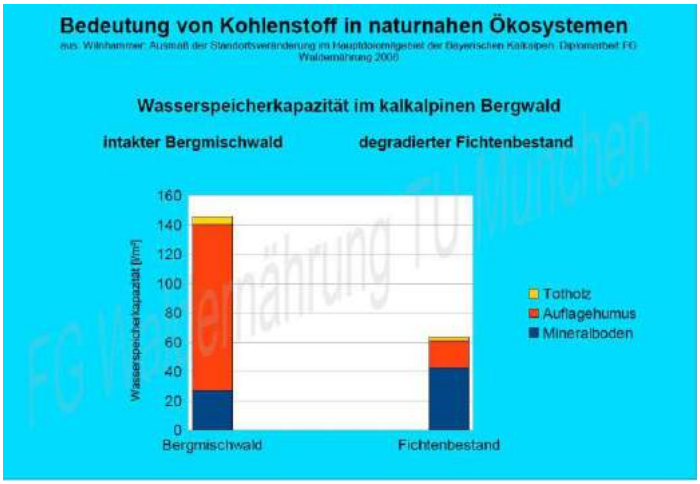


Fig. 1: Water retention capacity of mixed mountain forest and degraded spruce forest

Due to the higher infiltration rate under forests even high precipitation rarely causes surface runoff. This fact also leads to less erosion under forest cover.

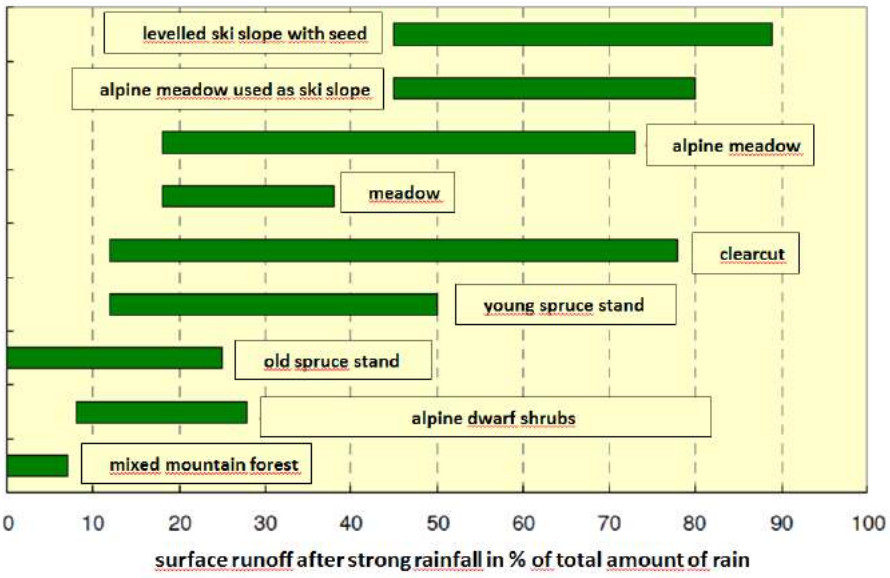


Fig. 2: Range of surface runoff in dependency of different types of vegetation and land use during strong rainfall (Kokai, 2009 after Bunza et al. 1989 cited in Patscheider, 2011

Forests and forest soils store large quantities of water, particularly forests with multi-layered structure with site-adapted species. So US data show a high effect of afforestation on peak discharge: it could be reduced from -41% to -85% (Lull, 1972). Disse (2017) reports an improved storage capacity on the landscape level through afforestation. Effects could be confirmed, but with large differences and uncertainty, particularly for basin's afforestation. For renaturation of riverbed the effect depends substantially on slope and riverbed area. In general reductions of peak discharge are limited, particularly for events with large return-period and for larger basins.

The influence of forests on water runoff in a watershed depends on the percentage of forest cover (Binder, 2013).

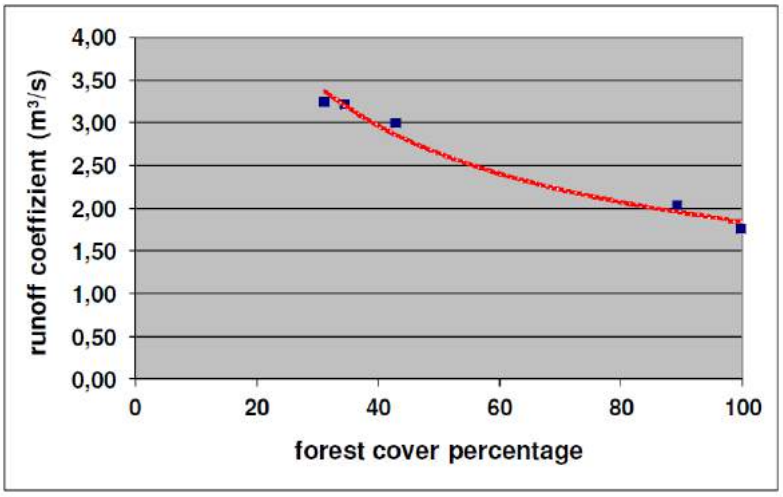


Fig. 3: Relationship between forest cover percentage and discharge (Binder, 2007)

In general the amount and intensity of precipitation and the distribution of precipitation in the period before an extreme event plays an important role for the water retention: the more empty the soil pores are, the higher is the retention effect of forests.

In total it can be said that forests have a positive effect on flood prevention. This is especially valid for smaller watersheds and short and heavy rainfall. But forests cannot absolutely prevent floods: after long periods of precipitation (constant rain) the soil pores are filled with water and the retention capacity of forests is exhausted.

1.2 Requirements on protection forests for prevention of floods

To support flood prevention forests should be managed in a way that it can work as a sponge as good as possible. That demands: maintenance of a good soil structure, improvement of infiltration rate and improvement of retention capacity.

Mixed and uneven stands with a high crown cover and a high percentage of regeneration are ideal for the prevention of floods (Binder, 2013). Forests that prevent floods should consist of trees that root deeply. Of special importance is the capability of rooting in soil horizons that partly are waterlogged. In mountain forests this is especially the case for silver fir, but also for ash and maple. Besides the root depth the intensity of root penetration is also important. For example the spruce has less root penetration as silver fir or beech. Large packages of raw humus can reduce the infiltration capacity of forest soils. Therefore trees with easy degradable leaves as maple and ash are important in mixed stands.

Mixed forests, unregular/unevenaged structures and the presence of wood debris have a positive influence on soil characteristic that improve water infiltration and retention.

For intensive root penetration and high interception a high forest cover percentage should be intended. Gaps in the forest cover should be held as small as possible. Clearcuts should be avoided, because after clear cuts the surface runoff is strongly increased. The risk of gaps by bark-beetles or windthrows should be reduced by mixed and uneven stands and permanent regeneration. Timber harvest should be practiced in a way that minimizes the soil compaction because soil compression

reduces infiltration capacity and retention capacity of the soils. Logging trails and roads should be planned in a way that concentration of surface runoff is prevented.

Forests cannot completely prevent floods. So the management of forest regarding flood protection can only be a part of an integral flood protection. A modern, future oriented flood prevention, is based on the actual condition of the catchment area, existing control works, existing risks and damage potential (Binder, 2017). Integral planning is composed of

- natural water storage, considering forest area increase and improvement of structure and soil condition
- technical works, considering maintenance of existing works and the necessity of additional works;
- flood management, considering residual risk, alert and emergency plan

The Bavarian flood prevention action plan 2020 (approved 2014) is a good example of an Integral Protection Plan. Forests play an important role in the improvement of natural water storage. So the adapted management and the restoration of protection forests is one of the measures of an integral protection plan.

1.3 Possible negative effect of input of wood in torrent beds

Trees and wood can also have negative impact on natural risks: during flood events in mountain catchments, driftwood can hinder water runoff. Therefore the monitoring of torrents to detect potential obstructions and the management of areas directly bordering torrents and rivers in order to reduce the possibility that trees fall in the torrents during flood events is very important.
Climate change has a powerful influence on both forestry and floods, with potential to change conditions and assumptions. Mauser (2017) reported that there is consent in the scientific community, based on the results of different climate models, that in the German Alps

- temperature will increase in the XXI century: less snow in winter and migration of climate belts toward the top of the mountains
- there will be less precipitation in summer and more in winter
- the combined action of temperature and precipitation will significantly change hydrological behaviour of the catchments (uncertainty on the new models)

The effect will be very important on floods: existing models and proceedings for flood protection have to be re-considered: possible changes in precipitation intensity and the hydrological effect of change in snow/rain precipitation must be verified.

On the other hand climatic change affects the growth conditions for tree species. Rising temperatures, changes in the amount and the distribution of precipitation and the increase of extreme events (storms, droughts) influence absence and presence of tree species and their distribution in the different altitudinal belts. The changed climatic parameters do also influence forest pest. The adaption of forests to the changing climate conditions is an important task. Climate change is a powerful source of new uncertainty.

2 Other risk factors for protection forests

There are several risk factors that reduce the protection effect of forests:

2.1 Hoofed game browsing, lacking regeneration

The influence of game browsing on forest regeneration can be a relevant problem. Winter-feeding that allows higher populations of hoofed game can make the problem even worse. Protection forests against flood risks should be of uneven age and with permanent regeneration. Too high wildlife stock prevents sufficient regeneration of forest trees or of trees species relevant for the protection functions (for example the silver fir). To prevent damages by hoofed game browsing several actions should be in focus:

- monitoring of hoofed game browsing,
- participation in setting-up of hoofed game shooting plans

2.2 Pure stands of (climatic) endangered tree species

Protection forests against flood risks should – if the natural site conditions allow it - consist of different tree species which are well adapted to climate change. Although during the last decades forest managers converted many pure stands into mixed and close-to-nature-forest stands, there are still relevant areas of pure stands of climatic endangered tree species in the alpine region. Their conversion into mixed stands is still an important task. Therefore it is very important that forest owners get financial support for this measure within the support for active and sustainable management (in the EU: Rural Development).

2.3 Wood pasture

In some parts of the Alps wood pasture is still in practice and can cause damages to forests. Particularly sheep and goats can cause severe damages to forest regeneration especially because they can reach the steep slopes and hinder the regeneration of protection forests. Also cows can cause harm to forest regeneration especially to young beech and sycamore maple.Even more important is the damage the cows can cause by their footsteps.

2.4 Lack of maintenance

An active and sustainable management of mountain forests is important for an optimum performance of their functions (this is also true for flood prevention). Natural development in selected areas should be a part of an integral forest management, but it cannot be a general solution: local conditions, forest functions and risks must be carefully considered and weighted. Monitoring is essential to detect negative change of the protection-function and must be provided by the public administration.

Mountain forests have to bear higher costs because of the steep and often difficult terrain, which leads to economically difficult forest management. Because of this many forest owners are no more willing to manage their property properly: there is a growing abandonment of forests, which dependening on the local conditions can result in lower protection and ecosystem services. The public therefore should provide financial support for the management of mountain forests: adequate infrastructure, machineries and training of owners, contractors and foresters is needed under the general objective to keep forests able to deliver their multiple functions.

2.5 Other critical issues

- The maintenance of the forest: the aging of coppices in the southern part of the Alps, especially on incoherent substrates and in high slope; the artificial forests of conifers; the repetition of fires that degrade ecosystems, damaging the protection functions and putting the slopes subject to heavy rainfall at risk of erosion;

- The maintenance of the water network: the clogging of the beams and the need for adequate sediment management plans; the loss of diffuse drainage systems that leads to the digression of surface waters with the risk of erosion phenomena;

- Forest road system:
The building and maintenance of forest roads influences flood protection. Roads can have a direct and strong impact in terms of modification of the morphology of the slope. This can lead to the risk of increase in surface run-off and water diversion. So the correct and careful planning and subsequent maintenance of the forest roads is important in mountain forests.

3 The necessity of a comprehensive and extended approach

The climate change is already causing intense meteorological episodes. The abandoning of forest management, which is rising in some regions of the Alps, might increase the impact of climate change, because correctly managed forests can provide better safeguard against natural hazards and are more stable against climate change.
Regional policies maintaining and improving the protection function of forests should be considered an important work for common welfare and therefor provided with adequate resources. Public awareness in the topic should be increased.

In particular:

- Programs at basin scale are necessary with a broad perspective and integrated policies, for the mitigation of the hydrogeological risk; measures should be continuous and widespread local communities involved and adequately supported;
- All stakeholders should be involved in the planning of appropriate prevention measures: the scientific community, the experts, the local administrations, farmers, environment associations, businesses and local citizens through awareness campaigns, information and education
-

Also at basin level comprehensive management plans should be adopted, considering the entire area and all functions of the watershed: land use, forest and water management should cooperate to reduce natural risks and generate ecosystem services, with special attention to forest areas connected to rivers and torrents. Plans should be funded to allow continuity of the measures.
Projects should have an ecosystemic approach and maintenance measures must be carefully designed and be harmonized with the stakeholders.

4 Definitions and organization in the alpine countries

There are significant differences between the Alpine Convention countries regarding the area and the importance of mountain forests for flood protection. So we tried to give an overview of the situation in some different countries.

Germany:	
Legal definition:	
With regard to flood prevention the following forests are protection forests: - Forests in catchments of dangerous torrents with flood and landslide danger that are covering slopes over 15° - Forests in catchments of slopes that are endangered of landslides, if landslides can be reduced by reducing the surface runoff. Forests with protection functions are under special legal protection. Clearcuts and transformation into other forms of land use are strongly restricted.	
Amount of forest with water protection functions:	
44.000 ha (28% of all protection forests)	
Organization	
Water management administration (Bavarian Ministry of Environment and Consumer protection)	Planning and realizing flood protection concepts on bigger water bodies, gives advice to local communities, makes flood predictions and flood warnings
Local comunities	Planning and realizing flood protection concepts on bigger water bodies
Forest administration	Consultancy of forests owners for the management of water protection forests. Restoration of protection forests.

Italy:
Legal definition:
The R.D.L. 30 december 1923, nr. 3267 recognised *senso latu* the protective function of the forest through the hydrogeological constraint: change of land use, works implying earth movements and forest management are subject to regulation. The regulation identifies also a more specific constraint aimed to special protection situations: *"woods, that due to the peculiar position, shield lands and buildings from avalanches, rockslides, strong winds, and those which are considered useful for the local hygiene conditions, may be subjected, if requested by Provinces, Municipalities, or other authorities and private entities, to limitations in their utilization"*. This kind of constraint has been however rarely applied and only in specific and sporadic occurrences. In the recent past, various regional administrations have started to apply, both in regulations and planning fields, a specific differentiation, according to the modern conception of the protective forest, but there is not e common definition on specific protection forests for flood prevention.
Amount of forest with water protection functions:
At alpine level forests subject to hydrogeological restriction by Royal Decree of 1923 are ha 2.670.630, 88,6% of the total.
Organization

The forest planning is in charge of the Regions that must provide them by integrating these plans with the Flood Risk Management Plans which are prepared, according to Directive 2007/60 / EC, by the basin authorities (2 in the Alpine area).

At the municipal level, emergency planning is also mandatory, while the interventions are generally carried out at local level by Municipalities or Union of Mountain Municipalities.

Liechtenstein:

Legal definition:

According to the Liechtenstein Forest Act (1992) the legal definition of protection forests is focused on the gravitational natural risk processes as rockfall, stone chipping, avalanches and mudslide. Such affected areas are recorded on the forest functions map within the Forest Development Plan (WEP, 2018). There are 3 different levels of protection: 1) direct protection of people and property, indirect protection of people and property and 3) site-protection.
Flood prevention is not particularly mentioned in the Act, as all forests play an important role in the restraint and storage of water, due to the special topography in Liechtenstein.

Amount of forest with water protection functions:

6'682 ha (100 % of all forests)

Organization:

Office of Environment Responsible for the conservation, restoration and management of all forests in the country. Close cooperation with Office of Civil Protection and local forest services.	**Office of Civil Protection** Planning, development and realization of flood protection concepts based on an integrated risk management. Close cooperation with Office of Environment regarding protection forests and with local torrent responsibilities.

Slovenia:

Legal definition:

According to *Rules on forest management plans and game management plans* (Uradni list RS, št. 91/10) the following forest functions are identified as flood protection forests:

- protection function against erosion processes, and
- hydrological function.

That are forests with special management plans.

Amount of forest with water protection functions:

518645.7 ha which is 77.5 % of Alpine convention area in Slovenia and 2.9 % of total area of Alpine convention (100 % of all protection forests)

Organizations

Slovenian Ministry of Environment and Spatial Planning
Operating: ARSO, Slovenian Environmental Agency & Concessionary services in Water Management (after 1.1.2016: Directorate for Water & Concessionary services) Based on Slovenian Water Act and its sub-legislations

Last revisions to the Water Act (Official Gazette of the Republic of Slovenia, No. 57/08),

1. Rules on the methodology for determining areas threatened by floods and their associated inland waterways and sea erosion and on the method of land classification in the threat classes (Official Gazette of the Republic of Slovenia, No. 60/07),
- Decree on the Conditions and Restrictions for the Implementation of Activities and Interventions in the Area in the Areas Affected by Floods and Related Erosion of Inland Water and Sea (Official Gazette of the Republic of Slovenia, No. 89/08 - hereinafter: the Flood Regulations) and
- Decree on the content and method of preparing a more detailed flood risk reduction plan (Official Gazette of the Republic of Slovenia, No. 7/10).

5 Best-practice examples

Many good best-practice examples could be collected during the conference „Flood protection through protection forests in the Alpine Region“ which was held during the German EUSALP-presidency from 23./24.10.2017 in Bad Reichenhall. Other examples were brought in by the members of the working group on mountain forests of the Alpine Convention.

Integral risk management on torrent in Bavaria

In the 100 years since establishment of torrent control major changes happened in land use: residence area and infrastructure grew substantially and forest cover also increased significantly. The old control works need to be maintained often replaced.
An Integral Risk Management Concept was developed considering:

- check of flood-risk: land use, actual vegetation cover's and soil's conditions and existing technical works; water discharge, bedload and trees transported during floods are considered.
- analysis of alternative strategies (considering original objective and actual conditions)
- definition and management of rest-risk, communication and monitoring.

Integral torrent development plan in Bavaria (Rimböck, 2017).

Integral torrent development plan in Bavaria are aimed to design an optimal management of torrent catchment areas. It consists of a circle of risk analysis, risk assessment and risk management. The projects consider technical works as well as the improvement of the forest in order to reduce the flood risks.
The following main objects have been defined:

- improving flowing conditions and creating bedload and water storage
- replacing and completing still necessary control works and abandoning those not needed anymore
- creation of a stable, mixed forest, capable of natural regeneration (forest measures and planting)
- change in hunting and grazing to allow good regeneration

Relevant stakeholders were involved in the project that considered all form of land use in the area. The project was carried out by water management agencies with the participation of forest agencies.

Integral Risk management plan Ahr valley catchment (South Tyrol, Italy) (Unterthiner, 2017)

The plan is carried out by municipalities with the cooperation of the torrent control and the forest services. The analysis for the plan considered

- land use: actual, changes, conflicts, potential conditions
- natural risks,
- water use, river and land ecology
- forestry:
  - protection function, actual condition and potential.
  - risk of trees in the river causing obstructions.

Special attention was given to the involvement of the community and stakeholders through communication, information and participation procedures have been put in place

Protection forest management by Bavarian State Forests (BaySF) (Müller, 2017)

BaySF are a major actor in the Bavarian alpine region, with a large land- and forest-ownership: 189.000 ha land; 159.000 ha forests (106.000 ha protection forests, 48.000 in production). As BaySF are in public ownership special attention to ecosystem services (particularly regulating ones) is given in the definition of management objectives.
In order of priority the management of the forests have to

1. maintain/improve protection function
2. sustainable wood production
3. other functions (particularly nature conservation and recreation) must be maintained
4. management of areas out of production
5. hunting must be compatible with previous objectives

Special measures help to maintain and restore the multi-layered structure of the forests and the needed tree-species. Special attention is given to maintain natural regeneration. The permanent forest cover and the natural regeneration help reducing the impact of extreme events (humus depletion, difficult regeneration).

Torrent monitoring in Tyrol (Fuchs, 2017)

Austrian Forest Law prescribe Municipalities to check **torrents (2.700 km in Austria) at least once yearly** to control possible obstacles to regular flow and monitor the stand of existing control works. 80% of the torrents are checked, only in particular conditions the monitoring is carried out in longer periods. Reports are checked by the federal technical service for torrent control. 50% of alerts are linked to trees (driftwood deposited by floods, large and unstable, trees in dangerous areas).

Torrent protection forests in Switzerland

The practice has already been described in the report 2015-2916 of the WG, but it is useful to be reminded in this context. Torrent protection forests are the larger part of protection forests in Switzerland (80% of the area) and are defined as forests that can directly influence torrent activity through landslides, bedload or large trees reaching the torrent flow.
Public subsidies for forest management are linked to protection functions and to the goal of more stability, improved positive effect on storage and soil protection and avoiding negative effects. Management objectives and forest measures must be detailed in the management plan and subsidy proceeding.

Switzerland has important projects on protective forests, with guidelines and specific training for foresters on the management of protection forests, where the primary objective is to improve stability and resilience of the forest

- silvaProtect.ch (http://www.bafu.admin.ch/naturgefahren)
- NAIS (Sustainability in Protective Forests)

River Contracts in Lombardy region

The bad quality of water in many watercourses, the urgency to govern complex basins, the need to answer to the increasing demands for territorial quality and direct participation of citizens, lead Lombardy Region to identify a governance tool able to meet the requirements and at the same time to effectively impact on territorial transformations. River Contracts are processes based on different funding (European funds, national and regional funds, calls of Foundations). They encourage to identify projects and funding in an integrated way.

The River Contracts experience in Italy begins 2004 with the Lambro-Seveso-Olona riverbasin: it is a process without a definitive deadline, with objectives and action plans to be renewed over time, without a closing date.
Today (2018) in Italy many experiences are starting and a dozen consolidated; among these, the most mature are in Lombardy and Piedmont Region.

In Lombardy they derive from the need to effectively manage the integration of Flood Risk Planning (PGRA), water quality protection (PTUA) and basin spatial planning. These are in fact planning issues traditionally handled in a sectoral way, to be integrated in a common strategy.

The Lombardy River Contracts focused **to foster resilient river communities, fixing and mitigating the impacts due to decades of heavy urban development and improper land and water use,** even in mountain areas.

The objective is to activate a "voluntary tool of strategic and negotiated planning pursuing basins conservation, good water resources management and river areas valorization, together with risk flood protection, contributing to local development (article 68bis of Environment Code Law 152/2006 update 2015).

River Contracts in Lombardy are promoted and coordinated both from Lombardy Region Government, both from local bodies as Parks and Mountain Communities.

Three River Contract characteristics are relevant:

1. The **focus** of concerted actions is **geographical and social**: a river basin cuts across any border, which puts emphasis on the common needs to support biodiversity and the shared cultural origins of settled human communities;
2. Negotiations and concerted action plans **involve territorial stakeholders**, from the public authorities at various levels (project, authorisation and infrastructure investments) to service providers operating in the area (water management companies), from scientific experts to NGOs and citizen groups, to businesses (such as farmers, fisheries, food industries etc.);
3. The River Contract measures are usually based on **research studies and diagnoses/prognoses on the best ways to recover, improve and preserve the river ecosystem**, but are defined in concrete terms and prioritized as per costs and benefits through a participative process.

Basins involved in River Contracts are Olona-Bozzente-Lura-Lambro Meridionale, Seveso, Lambro Settentrionale and Mincio. The basins with in-progress River Contracts are: Adda Valtellinese, Toscolano , Bardello (these entirely in mountain areas), Oglio, Mella. Olona, Seveso and Lambro Settentrionale River converge towards the Metropolitan Area of Milano.

The River Contract is the outcome of a process of negotiated multi-level governance, implying a multiplicity of concurrent initiatives, multi-sectoral and multi-actor, aimed at restoring the eco-landscape of an existing river basin. *The 2000 World Water Forum has characterized the River Contract as enabling "the implementation of a system of rules in which the criteria of public utility, economic profitability, social value and environmental awareness are equally involved in the search for effective solutions".* River Contracts identify strategic areas in which it is necessary to intervene: • water pollution management and reduction; • water risk management and reduction; • sustainable protection and enhancement of hydrographic systems and landscape; • urban renewal and environmental improvement along river corridors. Lombardy Region, supported by the ERSAF technical-scientific Team, is more and more assuming a coordination role and reference helping the Contract processes. In particular, the effort of coordinators aims to improve synergies among regional River Contracts and foster the integrated approach to several issues (flood risk, ecologic networks, ecosystem services, cultural heritage,...). The **Strategic River basin Project** is the instrument to implement actions; it assumes in its measures the river as the core of the process and decision-making, relating water quality, flood risk and ecosystem services. It implies to switch from a traditional sectoral and restrictive approach to the concept that constraints are opportunity to re-think the river and basin areas.
Each Contract details actions aiming to reach the identified objectives in the Action Plan. The action plan also provides an impact assessment framework dealing with: • water quality improvement targets; • river banks recovery, protection and maintenance investments; • hydraulic risk reduction and flood prevention measures, including Sustainable Drainage Solutions (SUDS); • better exploitation of water resources by the local service providers; • improved water management according to the different uses; • river ecosystem and biodiversity support and enhancement; • awareness raising, communication and dissemination.
Actions in Action Plan are targeted on the short-medium term and are updated every three/four years. The long term is considered in the Contract vision (strategic documents) with the main objectives.
Actions have different size and costs: from about thousands euro for training and awareness initiatives to action of millions euro for important structural interventions, such as flood retention basin or plants revamping.
Technical-Scientific Team of River Contracts cdf@ersaf.lombardia.it 0039 02 67404217
www.contrattidifiume.it
Since 08.03.2018 the national coordination requested by Environment Ministry has became operational through the institution of National Observatory of River Contracts (reference: http://www.minambiente.it/pagina/wp2-gestione-integrata-e-partecipata-dei-bacinisottobacini-idrografici)
http://www.contrattidifiume.it/export/sites/default/it/doc/Azioni/progetti_collegati/Mappa_CDF-lombardi_20180322.pdf

Good practices and current situation in Slovenia:

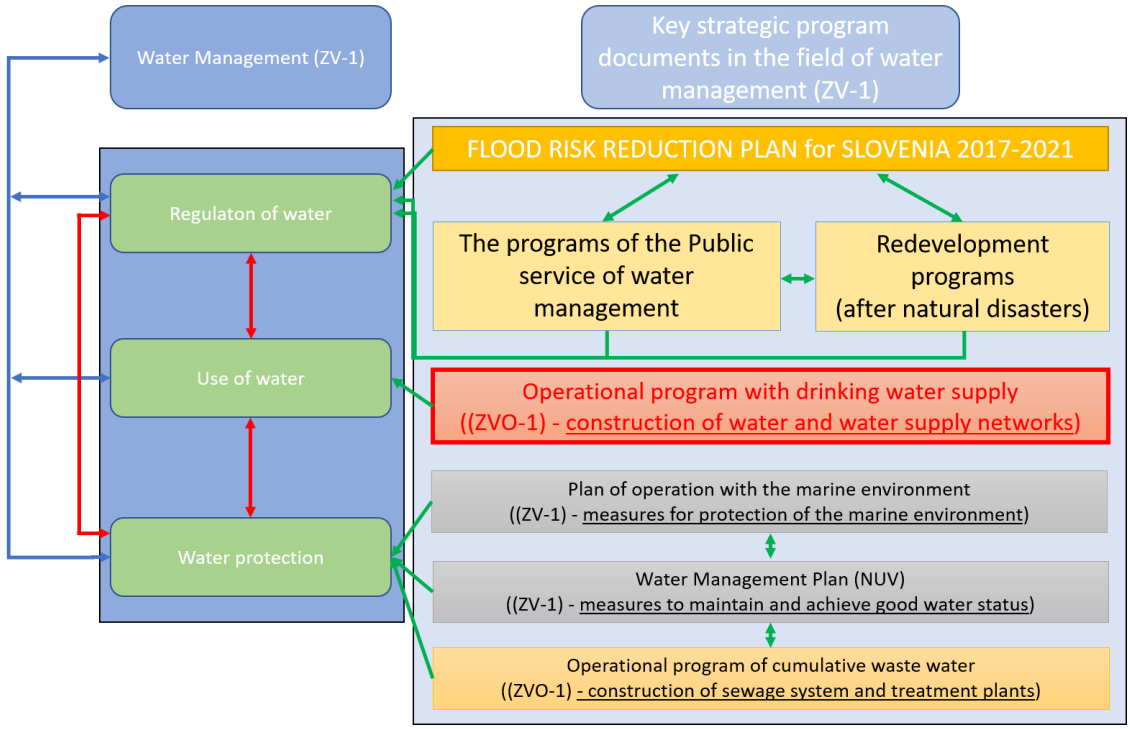


Fig. 4 *Water management (regulation, use and protection of waters) in relation to strategic program documents in the field of water management (2017), Flood risk reduction plan for Slovenia 2017-2021, Slovenian Ministry of the Environment and Spatial Planning, p. 262.*

Slovenia has been coping with enormous flood related damages in the last 10 years (approx. 150 mio EUR of damages per year). Trobec (2017) states that in Slovenia flash floods occur with varying frequency during different times of the year due to specific climatic conditions with a variety of seasonally dependent weather processes that generate heavy and intense precipitation that cause flash floods.

In recent times lots of structural and non-structural flood reduction measures have started. All of these activities have been integrated in the Flood Risk Management Plan 2017 - 2021 that has addressed and determined flood risks at the areas of potentially significant flood risk (61 such areas were identified in Slovenia). The basic task of the state is to ensure the comprehensive implementation of measures to reduce the harmful effects of water through the use of spatial and water planning, informing, educating and raising awareness of people and alarming events.

Because of above mentioned facts Slovenia adopted some important documents, namely **EU Floods Directive implementation:**

1. Preliminary Flood Risk Assessment – done (22.12.2011), published (22.12.2011) and reported to EC (22.03.2012);

2. Areas with Potential Significant Flood Risk – 61 APSFRs identified (14.02.2013) and reported to EC (21.03.2013);

3. Flood Hazard and Flood Risk Maps – reported to EC (20.03.2014);

4. Flood Risk Management Plan 2017 – 2021

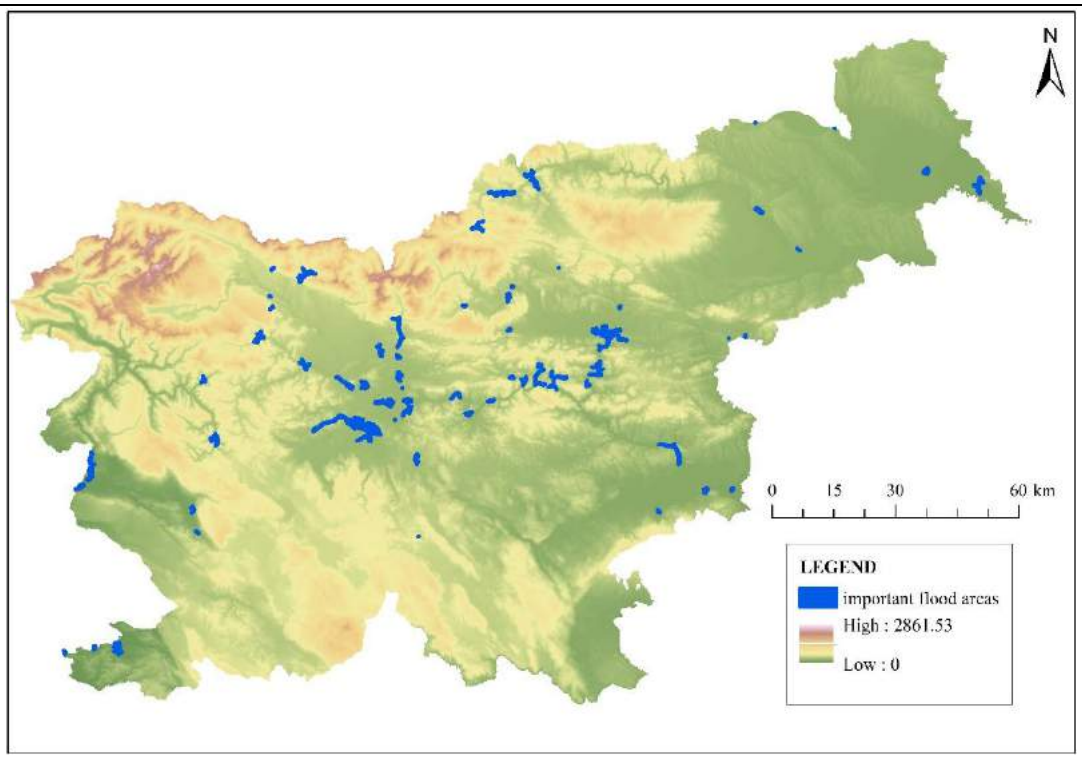


Fig. 5 *Map showing important flood areas in Slovenia*. *Source: Institute for Water of the Republic of Slovenia, Sector for Fresh Waters, 27.07.2018.*

Torrent protection forests in Slovenia

Horvat et al. (2008) recommend that damage inflicted by natural disasters can only be mitigated through systematic, long-term, integral and sustainable measures. In practice this means a set of appropriate measures within an integral system of managing dangers and risks, coupled with the participation of all relevant players. One should be aware that the issue of providing safety fro erosion and torrents is not limited solely to physical safety of the population in the affected areas, but rather has broader economic and demographic perspectives. In a country where nearly half of the territory is represented by areas potentially endangered by erosion, ensuring safety from erosion and torrents is also an important political issue. The price of preventing is significantly lower than the price of rehabilitation.

According to Papež (2011) reducing the occurrence of woody floats in torrential streams could be provided with the following measures:

1. planning and cultivation of forests: nurture the appropriate structure of the forest, adapted to the protective function; it is particularly important to remove unsuitable old trees in time, which can cause clogging of the riverbed;

2. planning, implementation and control of forestry work: exploitation of forest should be adapted in the torrent influence areas, anti-erosion measures, with consistent preventive behaviour, reducing possibility of introducing wooden floats (logs, stalls, branches, wood, etc.);

3. control role of foresters in the forest: identifying and documenting the extent and intensity of torrential and erosion processes and critical points (storage logging, logs, etc. in inaccessible places, etc.) providing necessary input data for an appropriate hazard assessment, timely planning and implementation of preventive measures (removal of wood from the riverbed, etc.).

Alpine Space project GreenRisk4ALPs (GR4A)

Goal is the development of ecosystem-based risk governance concepts with respect to natural hazards and climate impacts – from ecosystem-based solutions to integrated risk assessment. Especially in the Alpine Space (AS) forests and mountain ecosystems are outstandingly important and are increasingly considered on-par with technical measures or other prevention concepts: forests efficiently protect against avalanches, torrents, landslides or rock-fall. Without an adequate implementation of mountain ecosystems services (incl. forests) in a risk mitigation strategy, sustainable development in the AS will be hard to achieve, balancing green, technical and preventive risk strategies. To overcome conflicts and resistances all relevant actors are involved with science-based communication support.

The project foundation are five pilot action regions (PAR) from SLO/ITA/FRA/GER/AUT, which are fully involved.

Slovenia's CURRENT and FUTURE state regarding the flood protection

The current set of measures and projects for the period 2017-2021 is valued at approximately EUR 540 million. Potential sources of funding for the preparation, development and implementation of measures and projects are European and national funds and municipal budgets.

Two important research works are currently running on driftwood under the mentorship of doc. dr. Milan Kobal (Department of Forestry and Renewable Forest Resources, BF UL, Slovenia).

1. Estimation of the amount of woody debris and driftwood in torrents on the basis of multispectral analysis. The positive function of the wooden float in providing ecosystem services and the negative influence of the excessive amounts during floods is considered. A balance can be achieved through preventive measures in the wider area of watercourses and by appropriate monitoring of the **wooden debris and driftwood**. Multispectral imagery has proven to be a useful tool in the manual way of recognizing it and estimating their volume [Gregor Senegacnik].

2. The influence of the forest structure on the quantity and amount and distribution of wooden debris and driftwood in selected watercourses in Slovenia.

The research was carried out in the area of six watercourses in three different regions in Slovenia. The fieldwork included measurements of the location of the wooden debris and driftwood (x and y coordinates) and the estimation of the quantity (number) of the wooden debris and driftwood, the description of the building structure (the development phase, the tree structure) and the calculation of the distance of each piece from the road (roads and trains) [Avgustin Leskovec].

Literature

Binder, F. (2007): How to avoid floods. Presentation during the international conference "Sharing knowledge in forestry". Lessons learned from the EU Interreg Project KnowForAlp International Congress on Knowledge Transfer vom 27th to 29th June 2007, Gmunden Österreich, original data published by Binder, F., Macher, C. and Klöcking, B. (2008): INTEGRAL PLANNING OF REFORESTATIONS TO REDUCE PEAK FLOWS IN THE RURAL BAVARIAN COMMUNITY OF GELTENDORF, GERMANY, INTERPRAEVENT 2008 – Conference Proceedings, Vol. 2, S. 457 - 468

Binder, F. (2013): Leistungen der Forstwirtschaft für den Hochwasserschutz, LWF Wissen, Nr. 72.

Binder, F. (2017, unpublished): Schutzwaldsanierung, (k)ein Beitrag zum Hochwasserschutz, presentation during the EUSALP-conference „Flood protection through protection forests in the Alpine Region“, 23./24.10.2017, Bad Reichenhall

Disse, M. (2017, unpublished): Wirksamkeit von Aufforstungs- und Waldumbaumaßnahmen als Bausteine des dezentralen Hochwasserschutzes in voralpinen Einzugsgebieten, presentation during the EUSALP-conference „Flood protection through protection forests in the Alpine Region“, 23./24.10.2017, Bad Reichenhall

Fuchs, J., Gebhard, W. (2017, unpublished): Wildbachverbauung und Schutzwald, eine verschworene (tiroler) Gemeinschaft, presentation during the EUSALP-conference „Flood protection through protection forests in the Alpine Region“, 23./24.10.2017, Bad ReichenhallLull, H.; Reinhart, K.(1972): Forests and floods in the eastern United States, U.S.D.A. Forest Service Research Paper NE-226

Markart, G.; Kohl, B.; Sotier, B. (1996): Bergwälder als Abflussregulatoren, BFW Praxisinformation Nr. 40, S. 16-19

Mauser, W.; Ludwig, R. (2017, unpublished): Änderung der Niederschlagsverhältnisse im Klimawandel, presentation during the EUSALP-conference „Flood protection through protection forests in the Alpine Region“, 23./24.10.2017, Bad Reichenhall

Müller, D. (2017, unpublished): Sicherung der Schutzfunktionen durch nachhaltige Waldbewirtschaftung im Hochgebirge, presentation during the EUSALP-conference „Flood protection through protection forests in the Alpine Region“, 23./24.10.2017, Bad Reichenhall

Rimböck, A. (2017, unpublished): Integrale Wildbachentwicklungskonzepte, presentation during the EUSALP-conference „Flood protection through protection forests in the Alpine Region“, 23./24.10.2017, Bad Reichenhall

Unterthiner, G., Gius, S. (2017, unpublished): Vom Einzugsgebietsplan zur einzelnen Waldpflegemaßnahme, presentation during the EUSALP-conference „Flood protection through protection forests in the Alpine Region“, 23./24.10.2017, Bad Reichenhall

Report of the Alpine Forests Working Group of the Alpine Convention on Alpine Forests and the Green Economy

1. Introduction

The mandate of the Working Group on Mountain Forests of the Alpine Convention for the period 2017-2019 envisages an acknowledgement of the role that forestry, the wood/forest-supply chain and forests *per se* as natural assets could be playing in the framework of a transition of the Alpine region to a green economy.

This report addresses the issue by gathering a few examples of "good practices" consistent to the distinctive key-sectors of a green economy, based on the available research and categories developed for the "Sixth Report on the state of the Alps – Greening the economy in the Alpine region" (2016), and few other publications focused on mountain forests (Euromontana 2017; UNECE 2013).

In the frame of the Alpine Convention, a definition of "green economy" has been proposed in line with the UN, all-encompassing designation of such a type of economic system. Such an approach has clearly entered the Sixth Report on the State of the Alps (RSA6) (2016) which qualifies an Alpine green economy totally in line with the UN approach, i.e. *"[…] as one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive. Practically speaking, a green economy is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services".*

Each sector contributes to some extent to the economic health of the region. Understanding its "economic scope" allows to deeply root the sector – and the corresponding "good practices" – in the dimensions that shape the concept of "green economy". At any rate, the complexity and reach of the concept make the potential set of practices gathered particularly wide.

Assuming that the Alps (and mountains, more in general) tend to show a relative homogeneity in the economic sectors they typically host, a "green economy" includes many of them, and the transition that is expected to be met through a societal and economic transformation of the region should involve also forests – considered at large. Additionally the forest sector is a good example for a sector that has aimed for including "green topics" in its management strategies for a long time. A "close-to-nature-management" that is the guideline for the forest sector in many alpine countries is one of the outcomes of this aim.

In order to keep our approach simple enough, we will recall here only a few significant international sources showing a link to the long-term commitment of the Alpine Convention and its Mountain Forests Protocol to promote a sustainable economic use of Alpine forests. They basically include the already mentioned RSA6, the Euromontana (2017) Report, the Rovaniemi Action Plan for the Forest Sector in a Green Economy (UNECE 2010).

In particular, we use *four* key sectors of a "Green Economy" to frame this report, originally developed for RSA6:

1. *energy-efficient and low-carbon economy*
2. *resource-efficient economy*
3. *ecosystem services and natural capital-based economy*
4. *economy supporting quality of life and well-being.*

Additionally, a further sector will be considered as deserving a specific attention (though it actually can enter the sub-sector of resource-efficiency), i.e. the *circular economy* as defined by Euromontana (2017). Table 1 shows the resulting classification of categories used to organise the good practices discussed in the report as well as the good practices for each category.

Categories	**Good practices**
Energy-efficient and low-carbon economy	- Greenhouse gas balance of the Austrian timber chain (Austria)
Resource-efficient economy	- Short rotation forestry on marginal land (Germany)
Circular economy	- Forest's Contracts: an instrument of development and participatory management (Italy) - EU Strategy for the Alpine region sub-group «alpine wood» (Italy, Slovenia, France, Germany, Switzerland)
Ecosystem services and natural capital based economy	- Garden Village Bled (Slovenia)
Economy supporting quality of life and well-being	- EU Strategy for the Alpine region sub-group «alpine wood» (Italy, Slovenia, France, Germany, Switzerland) - Garden Village Bled (Slovenia)

Table 1. Classification of good practices by category from RSA6 (2016) and Euromontana (2017)

In general, an Alpine Green Economy aims at greening the entire economy, not a particular sector (RSA 6). There was a wide agreement among the experts involved in drafting RSA6, on the need for achieving such a goal of both technological and social innovations. Additionally, a transition would need "a re-allocation of capital and investment between sectors, a change in the demand for certain goods and services, and, accordingly, a change in prices and thus the profitability of existing investments" (UBA Germany 2015a).

Within the context of the Alpine Convention, the decision to address forests and forestry as topics worth investigating and supporting in a possible transition towards a green economy derives from the prevailing expectations concerning the capacities of this sector to address, and possibly solve a few major issues that fall under the abovementioned definition. Particularly, forests are expected to play some role across more than a single of the four sectors under investigation within RSA6.

The role of forests in a green economy is potentially widespread, and includes all the four key-sectors to be found in RSA6:

1. *energy-efficiency and low-carbon economy (e.g. through the management of CO2 emissions that can find a significant support in forests, under clear circumstances and conditions);*
2. *the efficiency in the use of resources and the implications for a circular economy (at the basis of forestry, forest management and the wood/forest supply chain);*
3. *natural capital conservation and the related ecosystem services (typically linked to forests, including water management, protection from natural hazards, protection of rare species and their habitats, etc.);*

4. *the contribution of the forestry sector to the creation of green jobs (improving quality of life for mountain people).*

In general, often forests show the capacity to simultaneously contribute to several of the sectors of an Alpine green economy: forests hold a potential in shaping mountain landscapes, attract tourists, improve human health, support jobs creation, incentivize natural capital conservation and generation of revenues (e.g. from forestry, tourism and other side-activities).

The Rovaniemi Action Plan for the Forest Sector in a Green Economy (2013)[1] includes a vision as well as a strategy aimed to support the transition of the forest sector towards a green economy for its region of interest. The actions envisaged by the voluntary plan are all in support to the aligned regional and national activities and considers Europe as a "laboratory" which could lead the way towards the green economy worldwide. Considered areas of activity in the Action Plan include climate change mitigation, workforce and occupational safety, payments for forest ecosystem services, evidence-based decision making and progress monitoring. In 2018, a mid-term review process took place on the whole Action Plan.
The five pillars of the Plan are recalled in Table 2.

Pillar A. Sustainable production and consumption of forest products	Patterns of production, consumption and trade of forest products are truly sustainable
Pillar B. The low carbon forest sector	The forest sector makes the best possible contribution to mitigation (sequestration, storage and substitution) of, and adaptation to, climate change
Pillar C. Decent green jobs in the forest sector	The workforce is able to implement sustainable forest management, and the forest sector contributes to achieving the social goals of the green economy by providing decent jobs
Pillar D. Long term provision of Forest Ecosystem Services	Forest functions are identified and valued and payments for ecosystem services (PES) are established, encouraging sustainable production and consumption patterns
Pillar E. Policy development and monitoring of the forest sector in relation to a green economy	Policies and institutions relevant to the forest sector promote sustainable forest management; policy making is evidence-based, policy instruments are effective, efficient and equitable and monitoring is adequate in order to mainstream the green economy in forest sector policies.

Table 2. The five pillars and goals of the Rovaniemi Action Plan (2013)

For each area of activity, the Plan proposes actions to be performed by defined actors (from governments to the private sector and the civil society), who might contribute to achieving its goals.
A particular interest can be found especially in the emphasis the Plan puts on sustainable production and consumption patterns for forest products and the potential of the sector to provide opportunities for green jobs, considered as a social goal. The Plan calls for ambitious and realistic strategies for decent green jobs in the forest sector. In particular, it sets as objectives under its Pillar C the following ones: development of appropriate skills in the workforce at all levels to carry out sustainable forest management, reduction of illnesses and injuries experienced by the forestry workforce, review of the work methods used for harvesting and silviculture aimed to assure the implementation of the best practices, and other goals[2].

[1] Approved in December 2013 in the joint session of the ECE Committee on Forests and Forest Industry (COFFI) and the FAO European Forestry Commission (EFC).
2 See: http://www.unece.org/fileadmin/DAM/timber/Green_Economy/Rovaniemi_Action_Plan/Pillar_C_-_Possible_Actions.pdf

The special emphasis on the social and occupational dimension of forestry found in the Action Plan stresses the potential of the transition to a green economy on creating new jobs in this sector consistently with the above-mentioned potential of an Alpine green economy to support well-being and quality of life in RSA6.

According to Euromontana (2017) the forestry sector lies in the *biological cycle* of a circular economy (i.e. involving materials that can be decomposed by living organisms) and makes use of natural resources such as water, soils, nutrients, and biodiversity underpinning the functioning of ecosystems and land. A circular economy in the forestry sector aims at recovering those resources, increasing the efficiency in their use, reducing waste and reducing their extraction, mainly through decreased demand.

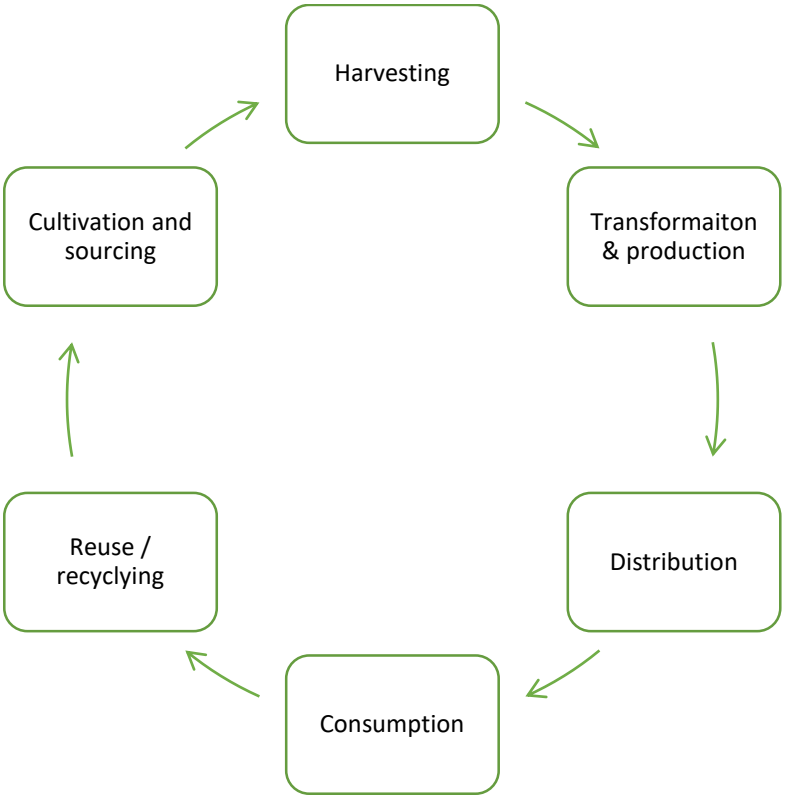


Figure 1. The circular forest supply chain according to Euromontana (2017)

According to an interesting case of application of the circular economy framework to the forestry sector (EIP-AGRI 2015, 6; Ellen MacArthur Foundation 2015), the main goals of a circular economy applied to forestry are:

1. The preservation and enhancement of natural capital by balancing renewable resource flows;
2. Optimizing (not maximizing) natural resource yields by circulating products, components and materials;
3. Fostering effectiveness by revealing and designing out wastes and detrimental practices;
4. Encouraging interaction between people, understanding our resources and making the most of our unavoidable wastes.

The most visible challenge for a circular economy is to balance the use of renewable resources, by taking into consideration the alternative uses for a limited stock – that can be renewed only in the long-run. In order to achieve this comprehensive result, instruments as partnerships and collaboration, financing, innovation, education, reuse and recycling, policy, and markets are likely to be supportive (EIP-AGRI 2015).

For the purpose of this report, we use the model applied by Euromontana (2017) when addressing the circularity of the wood supply-chain that consists of cultivation and sourcing, harvesting, transformation and production, distribution, consumption, and reuse/recycling. A circular forest supply chain does not stop with primary products (Figure 1).

Appropriate techniques, procedures and market instruments are required to support the use of waste (and products at the end of their life span) from the traditional production chain within the same production process or in other supply chains. Moreover, methods to enhance the multi-functionality of forests (e.g. production of non-wood forest products, such as berries, mushrooms, and herbs; and delivery of ecosystem services in the domains of water, protection from natural hazards, etc.) can support a sound establishment of a circular model in the forestry sector (Euromontana 2017).

2. Criteria and methods for the collection of good practices on forests and green economy

The collection of "good practices" that we present in the pages that follow derives from more sources.

The main document from which these "good practices" have been extracted is the Annex to RSA6 (2016). Its preparation was coordinated by the German Presidency of the ad hoc expert group and by the Permanent Secretariat of the Alpine Convention. The Report was formally approved by the Alpine Ministers gathered at the Alpine Conference in Grassau (DE), in 2016. The "Good Practices collection" attached to RSA6 is the result of a fruitful collaboration among the Presidency and its experts, the ad hoc expert group, the Permanent Secretariat of the Alpine Convention, and the other Working Groups and Platforms of the Alpine Convention. The Working Group on Alpine Forests has appreciated and welcomed the "good practices" dealing with forest management, forest product and management included in RSA6 and the Annex.

Another pivotal source for this collection is the Euromontana Report "Innovation and Circular Economy in the Mountain Forest Supply Chain: How to close the loop?" (2017), gathering experiences in support to transitioning towards a circular economy approach in the forestry sector, in mountain territories across Europe. A few cases dealing with Alpine forests have been considered of special interest for the purpose of the Euromontana Report: coherently, the Mountain Forests Working Group of the Alpine Convention included a few of them in this publication, based on the suggestion of its members.

The "good practices" are divided into thematic chapters covering a defined topic, based on the concepts recalled in the introduction and the categories used in the classification of Table 1. Certainly, some "good practices" locate somewhere in-between the categories of Table 1. When this is the case, we highlight the uncertainty of the positioning or the multiple purposes of the "good practices" in the text. At any rate, we declare the category under which the practice has been included.
We present the headline-categories selected for the following chapters in short in the introductory paragraph of each chapter.

The resulting collection aims to present a small selection of examples of actions, methods and instruments thoroughly applied or simply tested in Alpine territories. The selected good practices show a significant consistency to the interpretation of a "green economy" used in the framework of the Alpine Convention, particularly according to RSA6, and are in line with other international sources. Even though the collection is far from being complete, the chapters that follow include "good practices" from several Alpine countries, unevenly distributed across the categories of Table 1. A more diffused application of the methods, instruments and actions envisaged in the practices may support the transition to a green economy in the forestry sector across the Alps.

Greenhouse gas balance of the Austrian timber chain (Austria, 2013 – 2015)

Classified under the category of *Energy-efficient and low-carbon economy*, the practice under investigation considers that the **multiple use of wood** along the value-added chain provides both **economic and ecologic advantages** and includes active long-lasting measures for climate-change mitigation.

The practice shows for the first time in Austria how a multiple (or cascade) utilization of wood may shape under different scenarios based on alternative economic strategies for sustainable use of Austrian forests that foresee possible developments until the year 2100. For this purpose, some projects were carried out by different institutions[3] which assessed separately (but ensuring a cooperation and sharing of their measurements) the change in CO2 storage in trees and forest soils for the whole *Forest-Wood-Chain* (FWC). The scenarios show that the timber utilization along the FWC for product development is on the long run more favorable for the greenhouse gas (GHG) balance than the immediate utilization of wood for energy generation. A long lifetime of timber products can even reinforce these effects.

Efficient and sustainable forest management (SFM) allows for a proper use of wood as raw material, which is renewable but not available in an indefinite quantity. SFM allows to store almost the same amount of CO2 in forests than under other management approaches. However, multiple uses of wood associated to SFM can also lead to a reduction of GHG emissions from energy-intensive substitutes. In terms of GHG reduction, the benefits deriving from using wood as a raw material have to be interpreted in conjunction to the effect on GHGs of SFM: the sustainability of reserves, efficient forest management and utilization of wood as a renewable raw material are factors, which also are to be taken into consideration.

Concerning the economic impact of the practice, cascade or multiple use of wood allows to achieve efficient use of wood for energy and raw material production, with the lowest possible use of biomass. A common example refers to circular economy: the recovery of durable paper products in the timber industry, where, in turn, recycling is carried out several times. The remnants from the production of building or other materials are used as sources of energy, by playing an important role as substitutes for non-renewable raw materials (e.g. steel or crude oil). The assessment of these substitution effects which can be achieved by using wood products and byproduct is a priority in the project under investigation.

Concerning the environmental impact of the practice, on the long run, forest management and forest utilization have a markedly positive impact on the GHG balance and on climate change mitigation. With a moderate increase in stock reserves (about 50% than the increase in the last few decades in Austrian forests) additional positive effects on the overall GHG balance can be achieved over a few decades. A prerequisite for achieving this goal is that the production of sawn-wood for cascade-use is not too much restricted. If less sawn-wood is available, more energy-intensive raw

[3] Federal Forest Research Centre (Bundesforschungszentrum für Wald BFW), Vienna University of Natural Resources and Life Sciences (Universität für Bodenkultur BOKU) and Federal Environment Agency (Umweltbundesamt)

materials have to be used – with a negative effect on the overall GHG balance. With no utilization of wood, a balance would be achieved on the long run by which about 50% more carbon would be stored than it is currently the case (BAU). However, according to the analyses performed, such a view purely focused on forests is too much shortsighted, because on the long run the timber utilization and the permanent use of wood has an even stronger effect on GHG balance.

Timber participates in shaping production and distribution processes that play an important role in the Austrian value-added chain. Involved economic activities range from the timber and sawmill to the furniture and paper production industries. Huge quantities of GHG emissions are saved due to the use of wood and wood products, even though as much wood is removed from Austrian forests as it is growing there (the GHG balance is thus zero). According to the performed calculations, it is possible to save about the same quantity of GHG emissions generated over a period of 20 years in Austria by using wood and wood products until the year 2100. The resulting amounts of GHG emissions saved may be different in other countries, but the general conclusions and calculations from this case could be transferred to other Alpine countries.

Further information: http://bfw.ac.at/rz/bfwcms.web?dok=9986

Short rotation forestry on marginal land (Germany)[4]

Classified under the category *Resource-efficient economy*, the practice under investigation considers short-term forestry (STF) as an effective means to support a regional economy where fuel from local renewable energy sources (RES) is supplied according to sustainability principles.

STF foresees the planting of fast growing trees (e.g. poplar trees and willows) which can be harvested in a few years' time (4) and supply adequate and reliable quantities of wood fuel in a simple manner.

The first STF systems in Achental have beenwere installed in May 2011, near Übersee.

In order to increase resource-efficiency, an area of marginal agricultural land where – due to poor soil quality and hardly accessible location – classical farming is difficult and costly has been used for planting forests[5].Wood chips from local harvests are used by the "Biomassehof Achental" and the heating plant in Grassau. STF plantation covers 3 ha and is farmed by the landowner.

Concerning the economic impact of the practice, notwithstanding STF forests are localized in spare lands, the efficiency of the practice relies on short transport route for woodchip delivery, the choice of appropriate tree species and refined land management techniques.

Concerning the environmental impact of the practice, CO2 absorbed by the plantations during their early life, compensate CO2 emissions from burning woodchips as a fuel: the resulting balance is thus CO2-neutral. Moreover, using wood chips ensure savings of 11 tons of CO2 per ha, compared to fossil fuels (33 tons). Notwithstanding the potential adverse impact of CO2 and other emissions from burning woodchips in non-environmentally friendly stoves, the delivery of the harvest to the Biomassehof Achental plant ensures the deployment of innovative low emissions technologies. Environmental impacts are also reduced by avoiding to foster competition in land use for energy *vs.* food production in the region, where priority has to be given to nature and nutrition over alternative uses ("Nature and nutrition first") and all the areas where STF is practiced are not suitable for food production. The choice to build the main energy plant near A8 highway avoided the impact of the facility on the regional landscape.

The practice shows a significant adaptability to the Achental region where marginal land to be used for STF is available, appropriate tree species can be grown and local biofuel demand is ensured by regional customers (mainly: farms with biomass plant).

STF can be already found in many other locations in Germany, on marginal land. This approach to energy management could be easily transferred to other regions by significantly contributing to the renewable energy transition, without compromising food security and nature.

[4] Permanent Secretariat of the Alpine Convention (2016a*).*

[5] 25,000 saplings from an adjusted poplar tree species have been used to this end.

Garden Village Bled (Slovenia, 2014 - concluded)

The practice under investigation, to be categorized both under *Ecological services and natural capital based economy* and *Economy supporting quality of life and well-being*, considers that the use of local products is an essential success factor for the development of **sustainable green tourism** and the promotion of **sustainable consumer behaviors**. The Garden Village Bled is a green resort located **in the middle of the forests and built with local Slovenian wood**. Local products, nature, peace and calm, education, and a wellness program are the success factors for this experience.

Local stakeholders contributed to the realization and promotion of the project. The Bled Municipality had to develop a new spatial plan for the purposes of this innovative project, even though not all the desirable innovative green and self-sustaining solutions have been possible to implement in practice. In particular, the provision of all necessary building and operating products from only local-Slovenian suppliers has been very difficult to achieve.

C**oncerning the economic impact of the practice**, the involvement of local construction companies has been essential for building innovative accommodations with local material and by using traditional techniques – in particular the wooden tree houses and tents. Young people, adventurous and outdoorsy are employed to share their knowledge with the guests, contributing to green jobs creation. Creative workshops are organized aimed to show and inform guests about nature and natural materials, gardening, waste recycling, energy saving and healthy lifestyles.

The practice stands out for its **low environmental impact** achieved through an ecofriendly approach applied to almost all activities in the resort: transport by electric cars, use of solar panels and geothermal heat pump for heating, raw material production aimed to self-sustain the restaurant's demand for food, decrease of waste, and provision of amenities to the guests, surrounded with garden products. Moreover, the Garden Village is a natural habitat for animals mostly birds, fish, forest animals and small garden animals.

People worldwide are coming back to the nature in search of reconnection and life lessons. The village of Bled is today one of the most famous green tourist destinations, and the practice has been awarded as an innovative, green and creative project in Slovenia.

Further information: http://gardenvillagebled.com/

Forest's Contracts: an instrument for development and participatory management (Italy, 2004-2016)

Categorized under *Circular economy*, the practice under investigation shows that **participatory processes and shared tools** can help achieve **sustainable management and development** in the forests and pastures territories in Lombardy Region[6].

The Forest's Contract is an operational tool identified by the Charter of the Forests of Lombardy[7], which lays out guidelines for a model of development and asset management of regional forests, based on the principles of partnership with and participation of local communities. The Contract is an agreement between public and private entities for the development of the territory of forests and the surrounding areas in Lombardy. It is signed thus by the Regional administration and by local public and private stakeholders holding an interest in regional forest management, products, services etc. being interested in building a permanent place of confrontation, elaboration, promotion and implementation of actions aimed at local development.

The Forest's Contract is a voluntary tool[8] allowing the implementation of the actions that follow:

- Participative management for the promotion and implementation of actions aimed at a coherent development of a territorial unit;

- Governance for local development based on the consultation and the application of the subsidiarity principle to different levels of government;

- Sharing and coherent management of development policies, aimed to strengthen networks between partners and stakeholders.

- Integration, for a wider area than a single forest, among policies in the field of environment, territorial management, and spatial planning.

The participation in the management processes enables developing projects and actions on a large scale, which are more effective in attracting resources and have a greater chance of success. The Forest's Contract establishes a system of actors being able to self-organize, self-designing and self-managing their own development. The contract as an instrument is expected to make the process of development more effective and efficient in the interested areas. This shared new vision of development promotes synergies and solidarity between partners and, in so doing, rebuild links and networks along all parts of the supply chain and at all levels.

The practice promoted a **sustainable planning,** based on a vision of Lombardy forests as part of a whole territorial environmental system, and a **sustainable management** by achieving forest

[6] Lombardy Region owns 20 forests covering 23.000 ha, FSC and PEFC certified.
[7] It is the "Charter of the Forests of Lombardy - for the sustainable management and sustainable development of forests and pastures of Lombardy", signed between Lombardy Region and the Regional Entity for Services to Agriculture and Forestry (ERSAF) with 16 commitments for the shared management of the Region's forests.
[8] The agreement doesn't produce any legal obligations, but it relies on existing forms of negotiated planning, required by national and regional laws, and on the provisions of the Regional Law on Agriculture and Forestry

management certification in 2009 (PEFC and FSC) and improving production from pastures. It also advanced green values and developed the forests not only for their resources to be exploited, but also as landscapes and sites of diverse activities.

Eight Forest's Contracts have been signed up to 2017[9], covering 20.000 ha of regional forests and 90.000 ha of other territory, and involving almost 80 partners. The Contracts have mobilized 8 million Euros for project development. Participatory management of forest areas is still scarce, even in countries with an advanced economy. At the same time it is a desirable practice for politics and demanded by civil society. Participatory processes are still not widespread in Italy and in Lombardy: therefore, the experience gained through the management and implementation of Forest's Contracts is an important point of reference.

Further information: www.ersaf.lombardia.it

[9] Three further Forest Contracts have been defined in 2017.

EU Strategy for the Alpine Region (EUSALP) sub-group «alpine wood»

a –EUSALP Macroregional project for encouraging the use of alpine wood as a raw material (Italy, Slovenia, France, Germany, Switzerland; 2016 – ongoing)[10]

Categorized under *Circular economy* as well as under *Economy supporting quality of life and well-being*, the practice considers the contribution provided by transnational and integrated management of forest services and resources to the generation of value-added in the forest supply chain of the Alpine macroregion.

The practice has been developed under the EU Strategy for the Alpine Region (EUSALP), particularly under its *economic pillar* seeking to valorize Alpine resources by designing transnational and integrated models of products, services and investments. The timber industry is one of the key sectors for EUSALP.

However, forest exploitation in the Alpine region is not properly valued, especially in the construction sector. There are large disparities in terms of wood valorization and new approaches that remain scattered and separate. Moreover, current public policies do not sufficiently integrate the existing initiatives primarily driven by economic actors. The different segments of the economic chain do not cooperate, to the detriment of the whole sector. Nevertheless, numerous experiments (technical properties, architectural solutions, quality standards, etc.) have begun in the Alps in order to encourage the use of wood as a raw material.

Concerning the **economic impact**, the practice aims at coordinating Alpine actors in the forestry sector and creating a network of Alpine wood construction projects with demonstrative value (from both a technical and economic point of view). Following models such as the French project "Bois des Alpes", the project will bring together existing initiatives with common goals to better exploit forest materials through **sustainable use of wood with an approach to green economy**. The intent to increase the use of wood is tied to larger global issues as **environmental benefits of carbon storage in wood**.

This macroregional project aims to go beyond the framework of a typical EU project and coordinate public policies of territorial entities of an entire massif (the Alps) around a single objective. Through comparison of quality standards for alpine wood, based on confirmed characteristics of alpine species, the project aims to evaluate the possibility of introducing a single quality standard for alpine wood.

Due to its current nature of proposal, the project does not provide (until now) any form of implementation.

[10] The project operates with an initial funding for 3 years in the frame of the project AlpGov (Alpine Space Program), which is implementing the EUSALP Strategy. Other sources of funding will be identified at national, regional, and European level in the future.

b – Triple Wood (France, Germany, Italy, Slovenia, Switzerland; 2018 – ongoing)[11]

The Action Plan of EUSALP highlights the need to better use alpine specific resources in a more integrated manner. Products from the agriculture and sustainable forestry sector throughout the whole value chain (incl. wooden buildings), low emissions and energy efficiency are addressed. Several regional factors prompted the project development, including: the availability of huge wood supplies in the Alps; the potential of forests to participate in CO2 capture and storage; the situation with forest ownership and lack of proper forest management in many regions; promising innovation in facilities and machinery for wood processing; new construction and forest management techniques; and the potential of a regional network to increase the use of local and regional timber. The principal aim of the project is is to triple the use of wood in the EUSALP region in the near future, and to show how sustainable and high-quality buildings can be built by using wood.

The project involves three EUSALP AGs (AG 2, AG 6 and AG 3), applies a multi-level stakeholder approach, and shows potential economic, environmental and social impacts.

Under the **economic point of view**, the "*Triple Wood*" project significantly contributes to the combined objectives declared above, by fostering new relationships among different actors through value chains in alpine areas. By horizontally connecting the businesses involved in the wood value chain in Alpine regions, through new communication platforms and professional training events, *Triple Wood* aims at strengthening the regional wood business community.

Concerning the **environmental impact** associated to the practice, it applies to sustainable forest management and supports the use of new technologies and innovation in the timber sector and value chain. By building wooden houses, CO2 emissions can be cut (through CO2 storage) and higher energy efficiency attained.

For **social impacts**, two aspects deserve to be mentioned. First, more trust in timber construction both in rural and urban areas (where compact buildings are especially appreciated) can significantly widen the social acceptance and market for wooden buildings. This requires starting education programs for architects and engineers on updated techniques and opportunities from the use of wood in the construction sector – to be provided by knowledgeable institutions in Germany, Switzerland and Italy. Second, an increased use of wood may support green jobs' creation in rural areas, and open up new development paths for deprived and depopulated regions. By tightening the professional network between producers, entrepreneurs, architects and engineers, and public decision makers, technology transfer will take place much faster and increase skills and jobs. Public decision makers are expected to undertake comprehensive policies in support to the whole sector. Public events (e.g. exhibitions across the region) help show the people how living in wooden houses can be comfortable, climate-friendly, and attract private funding.

Many initiatives foreseen by the project aim at easing the dialogue and exchange of stakeholders: the timber construction industry can be involved in transnational working groups, and so can other stakeholders by saving money and time through sharing experiences. The participatory process is expected to be beneficial to, and foster the relationship among metropolitan, peri-mountain and mountain areas.

An exchange with consistent projects already running in the Alps and other ones developed in other programs' areas (e.g. Danube Transnational Program project FORESDA) can be supported, aiming at stimulating synergies and fostering the dissemination of available results in both directions, reaching a broader public, and supporting mutual learning.

[11] The project operates with an Alpine Region Preparatory Action Fund (ARPAF) for 2 years implementing the EUSALP Strategy.

Further information: https://www.alpine-region.eu/projects/triple-wood-triple-wood-sustainable-wood-building-culture-alpine-region

c- CIRCULALPS Project _ Circular and Bioeconomy in the Alpine wood supply chain

In the framework of EUSALP AG 6, a project focused on sustainable forest management and a coherent supply-chain has started in January 2018. Chaired by the Salzburg University of Applied Sciences, *CirculAlps* aims at promoting circular & bioeconomies in the Alpine timber sector. Starting from the assumption that both those approaches represent strategic perspectives (as highlighted by EUSALP AG6 & AG2 work plans), the project is expected to analyse the potential developments of wood supply chains in the Alps and their economic impact on the related sectors. Moreover, a widespread implementation of strategies for bio-based innovation & circular economy in wood supply chain has been recently identified as key for mountain regions by institutions such as Euromontana, the Alpine Convention and the Agricultural European Innovation Partnership.

Concerning the **economic impact**, it is worth mentioning that the timber value chain can benefit from innovative approaches based on the principles of circular and bioeconomy (e.g. management of discarded wood by adding further stages to wood life before biomass & using waste products as raw materials, such as bark as insulation material). Interestingly, a few good practices can be found both inside and outside the EUSALP region (e.g. regional cooperative of craft companies *Werkraum Bregenzerwald* in Austria; the *EcoSpruce* company exploring innovative uses for spruce needles in support of new value chains), but are still scarce, occasional, and have not been analysed in depth.

Starting from this promising, but still partially unexplored situation, this project focuses on three main actions:

- *analyzing the state of art and best practices from the forest and timber sector across the Alps,*
- *assessing the potential for initiating innovative circular and bio economy value chains in the EUSALP region, and*
- *identifying and highlighting the enabling conditions, whose transferability is also to be better studied and the transferring factors.*

Findings from the research conducted in this framework by partners with a specific expertise on wood value chain, bio-based innovation and circular economy in the forestry sector, will be collected and presented in a feasibility study.

The **social impact** of the practice is expected to be mainly in the wide participation that the project is expected to promote around some of its planned final products. Particularly, the project will

develop a “work plan” and a few recommendations by using participatory methods – i.e. by involving a large number of regional stakeholders from the forest and timber sector.

By the end of 2019 the study is expected to provide a sound investigation on, and a concrete proposal of a toolbox that may help support forestry entrepreneurs to actively implement the new value chain, by suggesting concrete actions and providing them with ad hoc tools and information bases. The project is expected to help set a solid basis for a widespread application of circular and bio economy models in the forestry sector across the whole EUSALP region.

3. References and policy documents

EIP-AGRI. (2015). *EIP-AGRI Workshop "Opportunities for Agriculture and Forestry in the Circular Economy Workshop Report 28-29 October 2015. The European Innovation Partnership 'Agricultural Productivity and Sustainability'.* European Commission.

Ellen MacArthur Foundation (2015). *Circular Economy Overview.* The Ellen MacArthur Foundation.

Euromontana (2017). *Innovation and Circular Economy in the Mountain Forest Supply Chain*

Permanent Secretariat of the Alpine Convention (2016*). Greening the economy in the Alpine region. Sixth Report on the state of the Alps*

Permanent Secretariat of the Alpine Convention (2016*). Greening the economy in the Alpine region. Sixth Report on the state of the Alps - Good practices collection*

UNECE Timber & Forest Section (2013). *The Rovaniemi Action Plan for the Forest Sector in a Green Economy*

Working Group "Mountain Forests"(2016). *Mandate of the Working Group "Mountain Forests" 2017-2018*

Working Group "Mountain Forests" (2016). *Report of the Working Group "Mountain Forests" of the Alpine Convention 2015-2016*