

Nuova serie / New series n. 12 - 2024

ARCHALP

Rivista internazionale di architettura e paesaggio alpino / Revue internationale d'architecture et de paysage dans les Alpes / Internationale Zeitschrift für Alpine Architektur und Landschaft / Revija za alpsko arhitekturo in pokrajino / International journal of alpine architecture and landscape



Risorsa e costruzione. Architetture in legno nelle Alpi

Ressource et construction. Architecture en bois dans les Alpes /
Ressource und Konstruktion. Holzarchitektur in den Alpen / Viri in
konstrukcija. Lesena arhitektura v Alpah / Resource and construction.
Wooden architecture in the Alps

ARCHALP

Rivista internazionale di architettura e paesaggio alpino / Revue internationale d'architecture et de paysage dans les Alpes / Internationale Zeitschrift für Alpine Architektur und Landschaft / Revija za alpsko arhitekturo in pokrajino / International journal of alpine architecture and landscape

ARCHALP

Rivista internazionale di architettura e paesaggio alpino / Revue internationale d'architecture et de paysage dans les Alpes / Internationale Zeitschrift für Alpine Architektur und Landschaft / Revija za alpsko arhitekturo in pokrajino / International journal of alpine architecture and landscape

Nuova serie / New series: n.12

Anno / Year: 07-2024

Rivista del Centro di Ricerca / Journal of the Research center
Istituto di Architettura Montana – IAM

ISBN 979-12-5477-487-8

ISBN online 979-12-5477-488-5

ISSN stampa 2611-8653

ISSN online 2039-1730

DOI 10.30682/aa2412

Registrato con il numero 19/2011 presso il Tribunale di Torino in data 17/02/2011

Associato all'Unione Stampa Periodica Italiana

Copyright © Authors 2024 and Politecnico di Torino
CC BY 4.0 License

Direttore responsabile / Chief editor: Enrico Camanni

Direttore scientifico / Executive director: Antonio De Rossi

Coordinatore editoriale / Editorial coordinator: Roberto Dini

Comitato editoriale / Editorial board: Antonio De Rossi, Cristian Dallere, Roberto Dini,

Federica Serra, Matteo Tempestini

Art Direction: Marco Bozzola

Segreteria di redazione / Editorial office: Antonietta Cerrato

Comitato scientifico / Advisory board:

Werner Bätzing (Friedrich-Alexander-Universität Erlangen-Nürnberg);

Gianluca Cepollaro (Scuola del Governo del Territorio e del Paesaggio - Trentino School

of Management); **Giuseppe Dematteis** (Dipartimento Interateneo di Scienze, Progetto

e Politiche del Territorio - Politecnico di Torino); **Maja Ivanic** (Dessa Gallery - Ljubljana);

Michael Jakob (Haute école du paysage, d'ingénierie et d'architecture de Genève,

Politecnico di Milano, Accademia di Architettura di Mendrisio - Università della Svizzera

italiana); **Luigi Lorenzetti** (Laboratorio di Storia delle Alpi, Accademia di Architettura di

Mendrisio - Università della Svizzera italiana); **Paolo Mellano** (Dipartimento di Architettura

e Design - Politecnico di Torino); **Gianpiero Moretti** (École d'Architecture de Laval -

Québec); **Luca Ortelli** (École Polytechnique Fédérale de Lausanne); **Armando Ruinelli**

(Architetto FAS - Soglio/Grigioni); **Bettina Schlorhauser** (Universität Innsbruck);

Daniel A. Walser (Fachhochschule Graubünden); **Alberto Winterle** (Architetti Arco

Alpino, Turrus Babel); **Bruno Zanon** (Università di Trento, Scuola per il Governo del

Territorio e del Paesaggio - Trentino School of Management).

Corrispondenti scientifici / Scientific Correspondents:

Giorgio Azzoni, **Corrado Binel**, **Francesca Bogo**, **Nicola Braghieri**, **Carlo Calderan**,

Conrandin Clavuot, **Simone Cola**, **Federica Corrado**, **Massimo Crotti**, **Davide Del**

Curto, **Arnaud Dutheil**, **Viviana Ferrario**, **Caterina Franco**, **Luca Gibello**, **Stefano**

Girodo, **Silvia Lanteri**, **Gianluca d'Inca Levis**, **Verena Konrad**, **Laura Mascino**,

Andrea Membretti, **Giacomo Menini**, **Martina Motta**, **Marco Piccolroaz**, **Gabriele**

Salvia, **Enrico Scaramellini**, **Marion Serre**, **Daniel Zwangsleitner**.

Progetto grafico / Graphic design: Marco Bozzola e Flora Ferro

Impaginazione / Layout: DoppioClickArt, San Lazzaro di Savena, BO

Stampa / Print: MIG - Moderna Industrie Grafiche (BO)

Curatori / Theme editors: Cristian Dallere

Ringraziamenti / Thanks to: Alessandra Stefani, Davide Pettenella, Hermann Kaufmann

Copertina / Cover: detail of the façade of the Salgenreute chapel, Bernardo Bader

Architekten, Krumbach, 2016 (Photo Cristian Dallere)

Errata corrige

Nel numero 11-2023, nella didascalia di p. 72 compare erroneamente come immagine d'apertura Église du Sacré-Coeur, Brig, Atelier coopératif d'Architecture et d'Urbanisme (ACAU), 1970 (Nadine Iten), la didascalia corretta è: Église St-Nicolas d'Hérémence, Hérémence, Walter Förderer, 1967 (Michel Martinez), ce ne scusiamo con gli autori e i lettori / In No. 11-2023 issue of ArchAlp, the captions on pages 72 erroneously report as the opening image Église du Sacré-Coeur, Brig, Atelier coopératif d'Architecture et d'Urbanisme (ACAU), 1970 (Nadine Iten), the correct caption is Église St-Nicolas d'Hérémence, Hérémence, Walter Förderer, 1967 (Michel Martinez). We sincerely apologise to the authors and our readers.

ArchAlp è pubblicata semestralmente e inviata in abbonamento postale.

Abbonamento cartaceo annuale (2 numeri): € 50,00, spese di spedizione per l'Italia incluse.

Il prezzo del singolo fascicolo è di € 28,00. Non sono incluse nel prezzo le spese di spedizione per il singolo fascicolo per l'estero (€ 10,00).

Per abbonamenti istituzionali si prega di scrivere a ordini@buponline.com.

È possibile pagare la tariffa con bonifico bancario intestato a Bologna University Press, IBAN:

IT 90P03069 02478 074000053281 oppure con carta di credito.

Variazioni di indirizzo devono essere comunicate tempestivamente allegando l'etichetta con il precedente indirizzo. L'invio dei fascicoli non pervenuti avviene a condizione che la richiesta giunga entro 3 mesi dalla data della pubblicazione.

Per informazioni e acquisti: ordini@buponline.com.

A norma dell'articolo 74, lettera c del DPR 26 ottobre 1972, n. 633 e del DM 28 dicembre 1972, il pagamento dell'IVA, assolto dall'Editore, è compreso nel prezzo dell'abbonamento o dei fascicoli separati, pertanto non verrà rilasciata fattura se non su specifica richiesta.



Politecnico di Torino

Dipartimento di Architettura e Design

Dipartimento di Architettura e Design
Politecnico di Torino
Viale Mattioli 39, 10125 Torino - Italy
Tel. (+39) 0110905806
fax (+39) 0110906379
iam@polito.it
www.polito.it/iam

Fondazione Bologna University Press

Via Saragozza 10, 40124 Bologna - Italy
Tel. (+39) 051232882
info@buponline.com
www.buponline.com

ARCHALP

Rivista internazionale di architettura e paesaggio alpino / Revue internationale d'architecture et de paysage dans les Alpes / Internationale Zeitschrift für Alpine Architektur und Landschaft / Revija za alpsko arhitekturo in pokrajino / International journal of alpine architecture and landscape

Nuova serie / New series n. 12 - 2024

Risorsa e costruzione. Architetture in legno nelle Alpi

Ressource et construction. Architecture en bois dans les Alpes /
Ressource und Konstruktion. Holzarchitektur in den Alpen / Viri in
konstrukcija. Lesena arhitektura v Alpah / Resource and construction.
Wooden architecture in the Alps

Indice dei contenuti

Contents

Risorsa e costruzione. Architetture in legno nelle Alpi / 8
Resource and construction. Wooden architecture in the Alps
Cristian Dallere

I boschi in Italia e le politiche forestali nazionali / 11
Forests in Italy and national forestry policies
Alessandra Stefani

Produrre legname per l'edilizia aiutando la natura di montagna e l'economia nazionale / 19
The production of timber for construction to support mountain ecosystems and the national economy
Davide Pettenella

Wood communities 23
Marco Bussone

1. Esperienze

Vergangenheit und Zukunft des Holzbau. Interview mit Hermann Kaufmann / 27
The past and future of timber construction: an interview with Hermann Kaufmann
Edited by Cristian Dallere and Matteo Tempestini

Architecture and local resources: project experiences in Vorarlberg 37
Luca Caneparo, Cristian Dallere

Experiences in Vorarlberg / 43
Simon Moosbrugger architekt, Bernardo Bader architekten, Bechter Zaffignani architekten, Hermann Kaufmann architekten, Innauer Matt architekten, Architekturbüro Jürgen Haller, Peter Plattner, feld72
Edited by Cristian Dallere

Wood Architecture Prize: gli approcci progettuali e i modelli di sviluppo territoriale analizzati attraverso i premi sulle costruzioni in legno / 67
Wood Architecture Prize: approaches to design and models of territorial development analysed through wooden construction prizes
Guido Callegari

Edifici in legno e digitalizzazione. Un dialogo costruttivo / 77
Wooden buildings and digitalisation. A constructive dialogue
Davide Maria Giachino, Franco Piva

Valorisation and regeneration in the western Italian Alps / **83**
Antonio De Rossi, Laura Mascino, Matteo Tempestini, Edoardo Schiari,
Maicol Guiguet, Davide Maria Giachino, Massimo Andreis Allamandola,
Vladyslav Mazur, Claudia Zappia, Dario Castellino
Edited by Cristian Dallere

Education, innovation and research in wooden architecture **93**
and construction in the Alps
Conversation edited by Roberto Dini

Technology and architectural expression in France and Slovenia / **101**
PNG architectes, Atelier Julien Boidot, Emilien Robin, Ateliers des Cairns,
La Manufacture de l'Ordinaire, Atelier 17c architectes, Atelier AMASA,
ARREA, KAL A
Edited by Cristian Dallere

Evolving Perspectives: the resurgence of wood in Quebec **115**
architecture
Gianpiero Moretti

2. Storia, tecnica, figurazioni

Mito, tipo e destino della casa mista nelle Alpi centrali / **125**
Myth, type and fate of the mixed house in the central Alps
Nicola Braghieri

Was kennzeichnet einen Holzbau? / What characterises a wooden **133**
building?
Marion Sauter

L'importanza dei masi come luoghi del paesaggio culturale **141**
ladino della Val Gardena / The importance of farmsteads as part
of the Ladin cultural landscape of Val Gardena
Joachim Moroder, Václav Šedý

Architettura rurale in legno: i *tabià* della Valle del Biois nelle **149**
Dolomiti Venete / Rural wooden architecture in the Venetian
Dolomites: the *tabià* of Valle del Biois
Eleonora Gabbarini

Technology and figuration in the central and eastern Italian Alps / **157**
Architekturkollektive null17, Studio Botter, Studio Bressan,
Delueg architekten, act_romegialli
Edited by Cristian Dallere





Architecture and local resources: project experiences in Vorarlberg

The *Land* of Vorarlberg is Austria's second smallest but most densely populated province after Vienna. Known for its innovative timber architecture, Vorarlberg's approach integrates ecological, economic, functional, and aesthetic considerations, as championed by Wolfgang Ritsch of the Vorarlberger Architektur Institut (VAI). The region's timber industry has faced challenges, including local provincialism and modernist material preferences, but gained prominence in the 1990s with the establishment of the *Baukünstler* group and the *Vorarlberger Bauschule*, recognised for their contributions to timber construction.

Key to this development is Vorarlberg's significant woodland, covering one-third of its area, and its commitment to sustainable forest management. Regional timber architecture aligns with the principles of appropriate technology, emphasizing eco-responsible, community-driven innovations. Vorarlberg's timber architecture exemplifies a collaborative effort between designers and craftsmen, focusing on the use of local resources and high construction quality. The essay represents the introduction of notable projects including multifunctional public buildings, schools, offices, and residential complexes, reflecting the region's commitment to sustainable development and architectural excellence. This ongoing innovation in wood-integrated solutions reinforces Vorarlberg as a hub for eco-friendly and culturally resonant architectural practices.

Luca Caneparo

Associate Professor of Architectural Technology at the Politecnico di Torino, Director of the Laboratory Territorial Integrated Project, and responsible for over 35 research projects. He has published *The Future of Cities and Regions* and *Digital fabrication in architecture, engineering and construction* with Springer.

Keywords

Vorarlberg, Holzbau, sustainability, wood supply chain, forestry.

Cristian Dallere

Architect and PhD fellow in Architecture. History and Project at Politecnico di Torino where he is undertaking research in wood architecture culture over Alpine territories. He is also a member of the IAM research centre (Istituto di Architettura Montana).

Doi: 10.30682/aa2412f

The *Land* of Vorarlberg, situated on the north-western slopes of the Austrian Alps and bordering Germany, Switzerland, and Liechtenstein, is Austria's second smallest province. Despite its size, with around 410,000 inhabitants it is the most densely populated after Vienna (Landestelle für Statistik, 2023). The exceptional nature of contemporary timber architecture production within the region is now recognised internationally. This recognition is not only rooted in the use of wood resources but is also part of a much broader discourse revolving around an eco-responsible development of the region and a “holistic” approach to design practice, as articulated by Wolfgang Ritsch, former director of the *Vorarlberger Architektur Institut* (VAI), which integrates ecological, economic, functional, and aesthetic aspects of architecture (Ritsch, 2003). The establishment and growth of the timber industry have been by no means linear, as timber construction had to assert itself against the backwardness and provincialism of the region on one hand, and against modernist influences favouring the use of different materials on the other. Friedrich Achleitner, architecture critic, writes of an autonomous and distinctive development in the period after the Second World War, referring to a *regionalen Bauklima* (regional building climate), scarcely achieved in other Austrian *Länder*. It was not until the 1990s that a group of architects and artists, referred to as *Baukünstler*, was finally established, leading this revolution “from below”, was finally established. In 1991, the International Prize for the Arts of the Land of Vorarlberg awarded its highest honour to the so-called *Vorarlberger Bauschule* (Kapfinger, 1999), which is naturally linked to timber construction.

To understand the origins of the lengthy process described above, it is essential to step back to the inter-war period. In 1934, Austrian architect Clemens Holzmeister published his essay titled *Der Holzhausbau*, discussing the decline of the timber building tradition, accompanied by economic difficulties in Austrian regions. Within this brief publication, Holzmeister highlighted several significant buildings, some located in Vorarlberg, to underscore the positive impact that sustainable forest management

and the use of locally available resources could have on regional economies.

Vorarlberg boasts woodlands covering one-third of its area (Amt der Vorarlberger Landesregierung - Abteilung Forstwesen, 2021), bordering Bavaria to the north and Tyrol to the east – two primary regions for the production of construction-grade timber. Considering this, alongside an understanding of the emergence of contemporary timber architecture, it becomes evident that this technology is particularly appropriate for the region. “Appropriate technology”, strictly speaking, refers to small-scale, simple, energy-efficient, environmentally friendly, labour-intensive, and community-driven technologies (Hazeltine, Bull, 1999). The development of appropriate technology is often regarded as a bottom-up innovation movement, emerging in response to perceived social injustices and environmental issues in conventional industrial production contexts (Smith, Fresoli, 2014, 2017). It promotes inclusive innovation processes for sustainable development, a phenomenon highly relevant to Vorarlberg's history.

Austria's forestry policy closely adheres to European guidelines, ensuring that forest harvest remains below natural reproduction levels, preserving growth capacity for the future and taking into consideration other criteria, such as biological and genetic diversity. The *Waldstrategie 2030+* (Vorarlberg Forest Strategy 2030+), published in 2021, outlines key challenges to ensure sustainable, optimised forest management, recognising their multifaceted roles. Forests play a crucial role in mitigating climate change by sequestering carbon dioxide and providing essential ecosystem services such as soil protection, water regulation, and reducing the risk of natural disasters like landslides and floods. Forestry strategies prioritise maintaining economic performance, supporting sectors from energy to construction, and generating employment opportunities. Additionally, there is an emphasis on strengthening the social functions of forests, raising public awareness about their importance, and promoting greater societal involvement and appreciation. The development and communication operations revolving around the timber industry in Vorarlberg, like the

Opening picture

Haus am
Stürcherwald,
Bernardo Bader
architekten, Laterns,
Vorarlberg, 2018
(photo Cristian
Dallere).

Fig. 1

Haus am Bäumele,
Bernardo Bader
architekten, Lochau,
Vorarlberg, 2016
(photo Cristian
Dallere).



meticulous work carried out by *Vorarlberger holzbau_kunst*, have increasingly refined this production machine, creating important reverberations in architectural production and design research.

Vorarlberg was and is an incubator of innovation in wood integrated solutions: more specifically, in the modular approach to construction, networking between production companies, and the renewal of building envelopes.

Oskar Leo Kaufmann and Albert Rüb pioneered modular timber constructions. Their concept of modularity for off-site fabrication evolved over time: from the earliest version, *System 1*, in 1997, *System 2* in 2002, to *System 3*. *System 3* was the winning entry in the exhibition “Home Delivery 2008: Fabricating the Modern Dwelling” at the Museum of Modern Art in New York. The installation featured one individual modular timber element prefabricated in Bregenz Forest and shipped in two containers; on-site assembly was completed in just seven hours. The System has further evolved into a new high-rise office, Life Cycle Tower One in Dornbirn. This innovation is inspired by lean construction principles: the construction workflow is streamlined by

Fig. 2
LifeCycle Tower, pilot
project for modular
prefabricated
construction system,
Hermann Kaufmann
+ Partner ZT GmbH,
Dornbirn, 2012
(photo Cristian
Dallere).



offsite wood-concrete composite ribbed slabs, complying with fire-protection regulations.

Networks of timber production companies with experience and construction specialisation contribute to fostering synergies at a regional scale, strengthening wood construction supply chains, and the innovation ecosystem. The number and scope of timber projects is multiplying around Europe, and orders are streaming in for timber construction companies. Most companies have reached their production limits. A future possibility is increasing manufacturing capacity through extensive automation of fabrication processes. Hermann Kaufmann considers that the actual pace of growth for the timber sector is slow, since it is grounded on skilled expertise and advanced production capabilities that cannot be replicated in the short term. Kaufmann and Stefan Winter at the Technical University of Munich have developed a research project on networking among small timber production companies taking advantage of digitalisation by means of BIM and web platforms for developing digital procurement and fabrication.

In terms of the systemised renovation of buildings, in 2008 the *TES Energy Façade* project developed large timber frame panels off-site. The project took advantage of existing automated timber frame production lines, resulting in quicker installation on-site and faster renovation with more predictable costs. Several buildings across Europe have been retrofitted, for instance the residential complex in Fernpassstraße, Munich, including new extension terraces: the existing stairways were converted into living spaces and replaced by access galleries, new external stairways, and elevators. A contemporary report, describing it as Munich’s largest timber project, said that it “achieves the best possible added value and efficiency in construction and operation, doubling the living space and reducing the energy used by a factor of 15” (Lichtblau Architekten, 2012).

Hermann Kaufmann states: «Just as the forest can only grow slowly, timber construction can only grow at a certain rate» assuming that it is able to avoid the pitfalls of oversimplification and generalisation that manufacturing poses to architecture, forcing out individuals who care about the quality of the work they love. Instead, construction and design must grow at a slow pace to preserve the continuity and evolution of place and culture. Constructions do not lose meaning due to technological innovation itself, but rather the aim of cutting costs and time, at the price of separating designers and craftsmen from the object of their work.

All the selected projects share a focus on the use of local resources and the quality of construction and space, naturally emerging from a fruitful collabora-

tion between designers and craftsmen. The projects showcased in the gallery are categorised according to their functional roles, encompassing industrial production buildings, public and private multifunctional structures, offices, school facilities, and residential complexes. The exhibition begins with an extension of the historic Rüscher joinery workshop in Schnepfau, designed by young architect Simon Moosbrugger, situated in the heart of the Bregenzerwald. Following this, two multifunctional public buildings are presented: the Pfarrhaus Krumbach, designed by Bernardo Bader, Hermann Kaufmann, and Bechter Zaffignani Architekten, home to a music school, community space, and library; and another project by Bernardo Bader, featuring a school and gymnasium in Laterns. Next is a project by Innauer Matt Architekten, a multifunctional building resulting from the revitalisation of an existing building that used to house a photography studio designed by Leopold Kaufmann; today the building features residential units and an architec-

ture studio. The gallery then transitions to school buildings, featuring the Egg kindergarten by Bernardo Bader Architekten and two kindergartens by Innauer Matt Architekten in Lustenau and Altach, respectively, which differ in the construction technology used. The first consists of a reinforced concrete ground floor on which the first floor is built using a system of wooden beams and pillars, while the second is constructed entirely of wood. In the office category, the forest insurance building, a collaboration between architect Jürgen Haller and Peter Platner, is highlighted for its compact and technologically efficient design. Finally, the review concludes with three residential projects: the *Maierhof* residential complex in Bludenz by Feld72, featuring volumetrically simple structures with high levels of prefabrication, and two projects by Jürgen Haller – a holiday home in Sibratsgfall, resulting from the demolition and reconstruction of a pre-existing building, and a single-family residence with an attached doctor's office in Schwarzenberg. ■

Bibliography

- Achleitner Friedrich** (1980), *Österreichische Architektur im 20. Jahrhundert - Oberösterreich, Salzburg, Tirol, Vorarlberg*, Residenz Verlag, Salzburg, pp. 391-461.
- Amt der Vorarlberger Landesregierung** (2021), *Vorarlberger Waldstrategie 2030+*, Abteilung Forstwesen, Bregenz.
- Dangel Ulrich** (2009), *Sustainable architecture in Vorarlberg. Energy concepts and construction systems*, Birkhäuser, Basel-Boston-Berlin.
- Franco Walter, Arrobio Osman** (2022), «The Contribution of Ellul and Illich's Thought to the Design of Appropriate Machines for Communities in Socio-ecological Transition», in Giuseppe Quaglia, Alessandro Gasparetto, Victor Petuya, Giuseppe Carbone (eds), *Proceedings of I4SDG Workshop 2021, IFToMM for Sustainable Development Goals*, vol. 108, Springer, Cham, pp. 118-126.
- Gauzin-Müller Dominique** (2009), *L'architecture écologique du Vorarlberg: un modèle social, économique et culturel*, Le Moniteur, Paris.
- Hazeltine Barrett, Bull Christopher** (1999), *Appropriate Technology. Tools, Choices, and Implications*, Academic Press, San Diego.
- Hofmeister Sandra** (ed.) (2023), *Hermann Kaufmann Architekten: Architektur und Baudetail/Architecture and Construction Details*, Edition Detail, Munich.
- Holzmeister Clemens** (1934), *Der Holzhausbau*, Österreichischer Holzwirtschaftsrat, Wien.
- Kapfinger Otto** (1999), *Architecture in Vorarlberg Since 1980*, Verlag Gerd Hatje, Stuttgart.
- Lichtblau Architekten** (2012), Fernpassstraße project, Munich, <https://www.hkarchitekten.at/v72/en/projekt/gwg-fernpassstrasse/>.
- Ritsch Wolfgang** (2003), «Holistic Building», in Vorarlberger Architekturinstitut, Institut français d'architecture, *Constructive provocation. Contemporary architecture in Vorarlberg*, Verlag Anton Pustet, Salzburg, pp. 4-7.
- Smith Adrian, Fressoli Mariano, Thomas Hernán** (2013), «Grassroots innovation movements: challenges and contributions», in *Journal of Cleaner Production* 63, pp. 1-11.
- Smith Adrian, Fressoli Mariano, Abrol Dinesh, Elisa Around, Ely Adrian** (2017), *Grassroots innovation movements. Pathways to sustainability*, Routledge, London & New York.