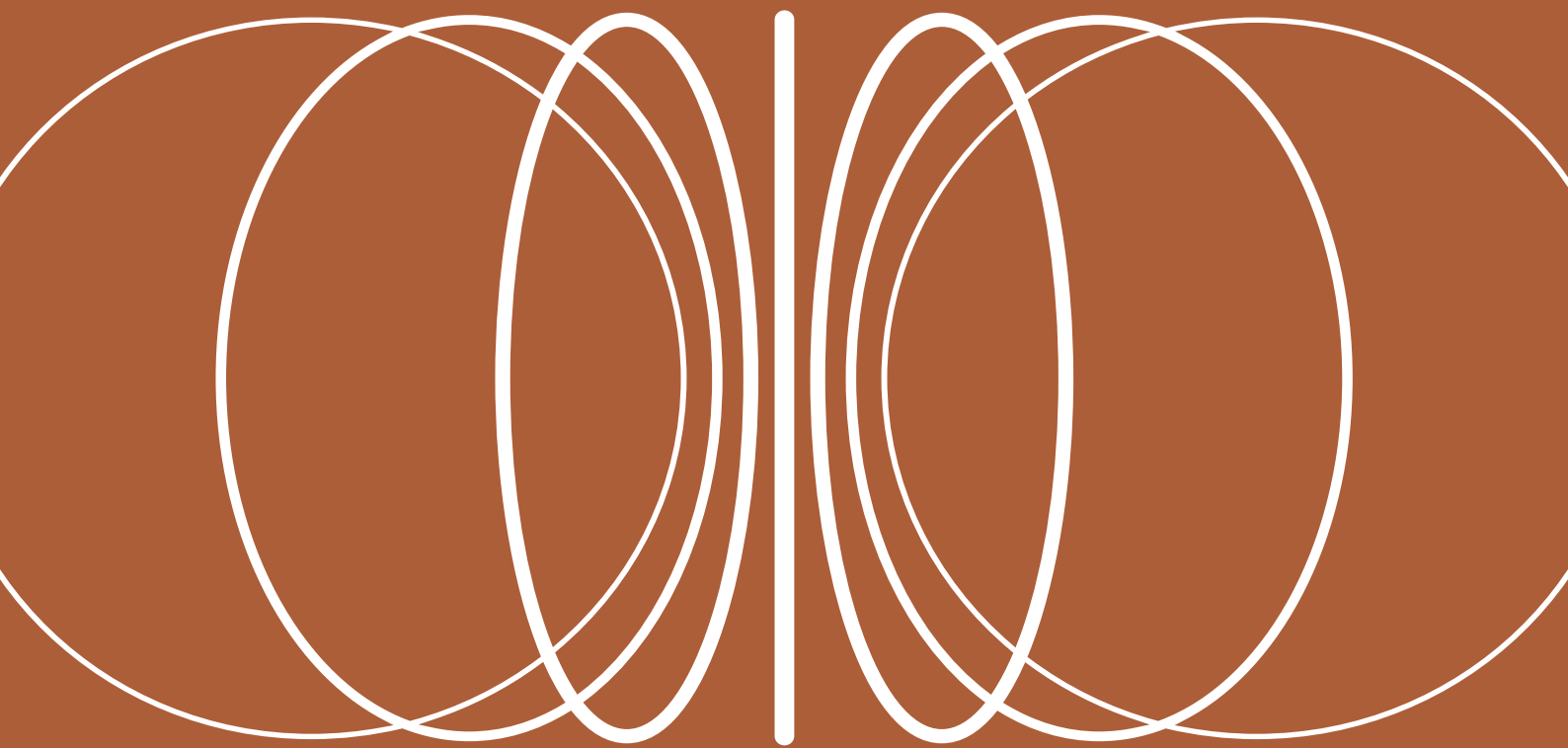


RESILIENCE IN DESIGN



Forward-thinking approaches to equity, prosperity and ecological responsibility

The Resilience Equation

Amaia Celaya Álvarez - Director
of Resilience in Design Seminar at
ELISAVA

The Resilience Spring Logic

Tools designed (or aimed) to create
a better world, through absorption,
adaptation and transformation

10 Case Studies

First edition of Resilience
in Design Seminar at
ELISAVA

Table of contents



Fig. 1. Resilience cases impact map (Alzola, 2024).

Introduction

- **Introduction**
By Santiago Albert Seseña and Enric Bayó | ELISAVA
- **A bit of Theory** | Spring logic
By Amaia Celaya Álvarez | United Nations and European Commission

0304

Case Studies

- **SPIRE Smart Post-Industrial Regenerative Ecosystem** | Baia Mare City Council
By Dorin Miclaus
- **From recycled wood to wall cladding** | Reviste start-up
By Joaquín Acevedo & Joaquín Cuevas
- **Applying indigenous knowledge to roadbuilding on permafrost** | The George Washington University
By Nikolay Nikolaev
- **Co-defining the city risks map** | Barcelona City Council
By Ares Gabàs Masip
- **Creating healthy workspaces Mipmari office refurbishment in Palo Alto coworking** | Mipmari
By Txell Manresa
- **Evolutive design in humanitarian shelter** | IOM UN Migration
By Marta Leboreiro Núñez
- **Payments for Ecosystem Services (PES) for carbon sequestration monitoring innovative resilience building mechanism in the Sahel** | OXFAM Intermón
By Sébastien Thomas
- **Adapting to the new reality of the wine sector in the Mediterranean** | Vins El Cep
By Roger Canals
- **Combating indoor air pollution with smokeless kitchens** | Awasuka Program
By Mònica Sans Duran
- **Bio-hybrid light emitting diodes (BIO-HLEDs), fluorescent proteins as an ecofriendly alternative to traditional lighting** | Technical University of Munich
By Sara Ferrara & Prof. Dr. Rubén Costa

11151923273135394347

Way Forward

- **Takeaways**
By Sébastien Thomas | OXFAM Intermón
- **Afterword**
By Braulio Eduardo Morera | World Economic Forum
- **Bibliography**
- **Acknowledgments**

51525354

Intro- duc- tion

This work is not just a call to action but a guide for those committed to meeting the challenges of designing a better future.

Santiago Albert Seseña | Director of Master and Postgraduate programmes and Longlife Learning at ELISAVA

In a world marked by rapid change and unforeseen social, political, cultural and environmental challenges, the concept of Resilience has become essential and more critical than ever.

Design for resilience is, therefore, a proactive and creative response to these challenges, recognising the need to develop solutions that not only provide creative and disruptive pathways to address current crises but also would enable one to anticipate and face uncertainty by retrieving convergence between probable and desired futures. This interdisciplinary approach links design practices with the principles of social equity, cultural adaptation and shared prosperity, all striving to foster a better and more adaptable society.

Resilience in Design delves into the intersection of talent, creativity, knowledge and commitment, emphasising with how Design can not only withstand adversity but thrive within it. By embracing a sustainable mindset, it provides responses to both current risks and emerging trends. Inclusive design can address planetary social challenges such as poverty, lack of access to basic services, and inequalities in education and health.

It focuses on accessible and adaptive products and services, contributing to social justice, equity, and fair transitions toward collective well-being, through the strengthening of the social fabric and the enhancement of quality of life across different contexts.

Participatory design, design for the common good, and public policies design contribute with resilient visions and solutions to navigate a generally polarised political context, characterised by institutional distrust and constant shifts in public policy that do not always pursue the common good. This type of approach favors solutions that consider individuals, helping to reinforce social cohesion and find more democratic and robust solutions inspired by the spirit of collaboration and social consensus.

Design that cares about identity favors respect for cultural particularities and traditional knowledge, aiming to create harmonised solutions that reflect and preserve community bonds and idiosyncrasy. This vision is especially relevant in a context where rapid social and technological changes tend to impose globalised and homogeneous values and aesthetics.

Environmental design involves not only minimising harm to biosystems but also adapting to the inevitable effects of climate change through practices such as regenerative design, circular economy principles, and the creation of new sustainable materials. Ecosystemic challenges such as the climate crisis, biodiversity loss, air, water and soil pollution, and waste management, among others, demand solutions that reduce ecological impact and promote resilient-based sustainability.

By highlighting several case studies, thought leadership, inclusive management, and attentive implementation, this work aims to inspire designers and creators to make decisions and build, with resilience in mind, crafting solutions that care, adapt and endure. The following pages explore how Resilience can be embedded in every aspect of Design, from participatory approaches and traditional knowledge to high technological materials and products.

Can design contribute to a fairer and more ethical society from global knowledge while supporting grassroots initiatives?

Can design positively transform our environment, from awareness to environmental activism?

Can design improve people's lives through resilience thinking from various approaches, scales and scopes?

Enric Bayó | Manager of Innovation & Business Model at ACCIÓ and Executive Masters and Postgraduates Coordinator at ELISAVA

These are the crucial questions we asked ourselves in the Resilience Case Studies seminar performed in February 2024 in ELISAVA with approximately 50 students from three of ELISAVA's master's programmes: Master's in advanced design management, Strategy and Entrepreneurship; Master's in research for Design and Innovation; and Master in Strategic Design in Complexity.

In the seminar, we explored, analysed, and explained a variety of practices within a common framework of resilience design: from the product/service to the city/region, from the climatic action to the business solution, from the social engagement to the governance tool.

Amaia Celaya Álvarez | Resilience Senior Advisor at United Nations and European Commission

A bit of theory | Spring logic

Design is both a set of skills and a mindset, a particular way of thinking about a problem, putting pieces together to achieve function, and creating meaning that leads to new ideas. It uses our head, our heart, and our hand. The head allows us to frame the right questions, explore various types of knowledge, and take a creative and daring leap toward an answer. The heart tells us that we must sympathise with the affected people and understand what works for them while thinking about the collective impact on others and our planet and building relationships with organizations and individuals that could be part of future solutions. The hand puts our creativity into practice, working with different elements to give life to ideas and make them tangible in prototypes and real objects, digital products and systems (Design Council, 2020).

When thinking about **sustainable design**, the Triple Bottom Line concept presents a comprehensive framework which encompasses social (people), environmental (planet), and economic (prosperity) dimensions. Design thinking aligns inherently with these dimensions by addressing problem-solving's functional, empathetic, and practical aspects. How can risk and resilience concepts further enhance this rationale?

Risk represents the potential negative impacts and uncertainties that could undermine any system's stability and sustainability.

Resilience is the capacity of a living being to adapt to a disturbing agent or adverse situation. Derived from the Latin word *resilio*, which means "to bounce back" (RAE, 2024), and can be compared to the movement of a compression spring (Fig.3). Resilience is about absorbing impacts, adapting to new realities and transforming them towards desirable futures.

My Resilience Equation

$$P + P + P - Ri = Re$$

(People + Planet + Prosperity - Risk = Resilience)

© Amaia Celaya Alvarez

Fig. 2. My resilience equation (Celaya, 2020).

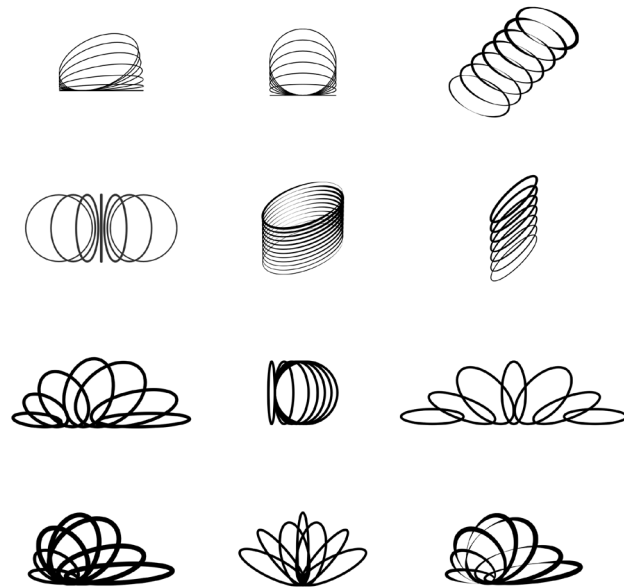


Fig. 3. Compression spring logic (CARMAN, 2024).

Resilience is intricately linked with sustainability and encompasses the aspects of risk reduction and the ability to adapt to and mitigate change (Fig. 4), but also the capacity to transform the reality and the context we are living in. Design should not only enhance the resilience of a system, but also contribute to its overall long-term sustainability.

Resilient and sustainable design needs to consider planetary boundaries and employ regenerative and redistributive practices. Resilient and sustainable design needs to guide us to develop and thrive in the donut, in the safe and just space for humanity between the planetary ceiling and social boundaries (Fig. 5), and here the concept of "unlearning" is fundamental. To truly change the world with our actions, we must challenge our thinking and reinvent existing systems.

This includes, for example, transitioning from a traditional linear resource consumption model (known as "take-make-waste") to a circular one (based on "reduce-reuse-recycle" and a closed loop). Also, challenging the capitalist convention of linear infinite economic growth, which brings us devastating environmental and social implications and embraces a degrowth and 'undo' logic instead (n'UNDO, 2011).

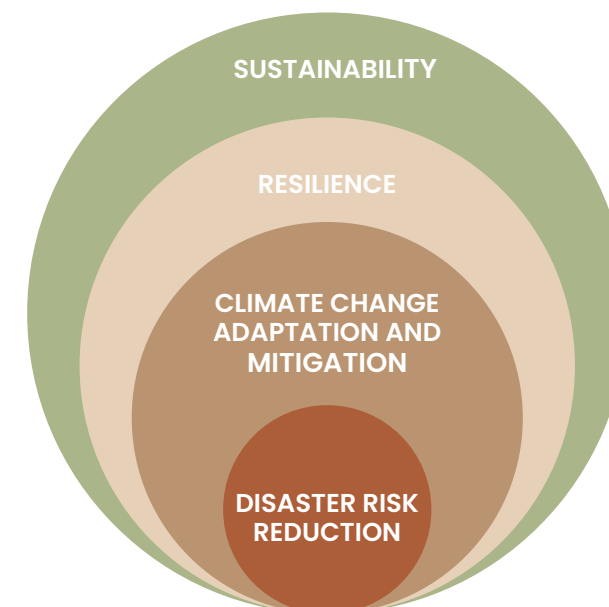


Fig. 4. The broader context of resilience and sustainability (Morchain & Robrecht, 2012).

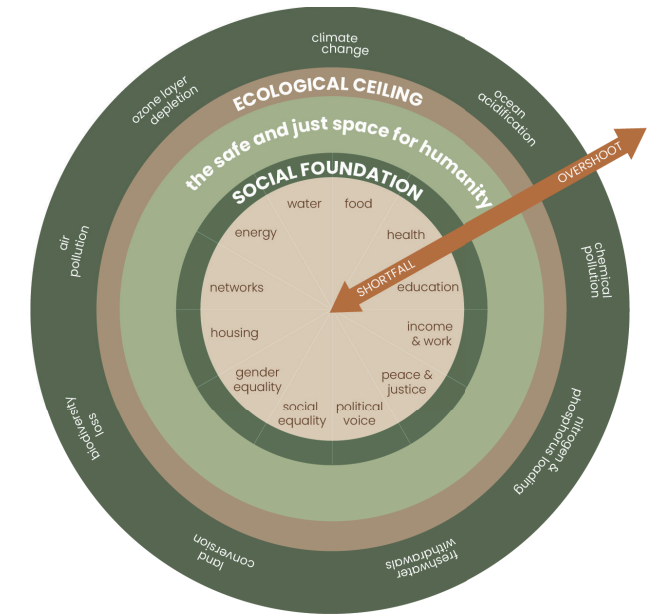


Fig. 5. The Doughnut of social and planetary boundaries (Raworth, 2017).

Or moving away from seeing us, humans, as superior species due to our cognitive abilities to a more humble way of viewing ourselves as one of the many species inhabiting this planet, and embracing our role as custodians for preserving and nurturing all kinds of life on Earth. These are just a few examples of the unlearning processes needed for designing a more sustainable future.

Integrating resilience thinking with sustainable design frameworks can create more innovative and impactful strategies and tactics that are able to address and mitigate risks and adapt to future threats and challenges but also transform/recreate new systems, as well as consider the inherent vulnerabilities of the design itself.

The 7 Steps of Spring Resilient Design

01. Empathise

This step involves gaining a profound understanding of the stakeholders' aspirations, challenges, and needs. By empathy, the designers can ascertain that the solutions developed are pertinent and address real issues, enhancing the social aspect of resilience in addition to the environmental and economic dimensions.

02. Unlearn

Unlearning involves transcending existing assumptions, biases, and knowledge that may come from creative thinking. It is a question of letting go of preconceived notions and being open to new ideas and approaches. By unlearning, designers help unfetter traditional ways of thinking so that new solutions to emerging risks and uncertainties can be accepted.

03. Anticipate

Anticipation is forecasting potential future challenges and opportunities. It involves proactive thinking and scenario planning to prepare for various possibilities. By anticipating future conditions, designers can create more robust and flexible strategies to adapt to changes and uncertainties, enhancing resilience.

04. Operate

This step involves the management and implementation of resiliently designed solutions. It includes developing, testing, and refining prototypes and actual products or systems. By operating, designers ensure that ideas are translated into workable solutions usable in the real world to test their effectiveness and workability.

05. Impact

Impact assessment quantifies the results of solutions implemented. The social, environmental, and economic impacts of the project are evaluated. Designers use impact measurement to inform if the solutions achieve what they set out to do and what positive contribution they make towards resilience, improvement and scaling.

06. Report

This step involves documenting the process, findings and results. It includes generating detailed records and analyses to be shared and used for future reference. By reporting, designers assure transparency and accountability, providing valuable appraisals and lessons learned to inform foreseen projects and decision-making.

07. Narrate

Narrating is all about telling the project's stories. It conveys the journey, challenges and opportunities, successes and failures in a way that is engaging and easy to understand. Narration aids in spreading knowledge, garnering support, and motivating others. It makes the process and results relatable and comprehensible, creating a broader impact. It also promotes empathy for others' problems.

These actions create a strong mindset to address complex design problems using the resilience logic. Through empathy with stakeholders, unlearning bias, anticipating the future, operating effectively, assessing impact, reporting in-depth, and narrating the process, forward-thinking design solutions can be innovative and resilient to various threats.

This seminar explored the potential of combining the concepts of design and resilience by sharing diverse case studies. We proposed that different practitioners organise their design experiences as case studies following the 7 steps of the compression spring rationale, covering diverse action areas across Europe, Latin America, Asia, and Africa. The case studies work with different focuses, approaches, scales, and actors involved.

A total of 14 case studies were showcased during the week of 12–16 February 2024, to approximately 50 students from three ELISAVA's master's programmes: Master in Advanced Design Management, Strategy and Entrepreneurship; Master in Research for Design and Innovation; and Master in Strategic Design in Complexity. Students were an integral part of the workshop, helping to question, refine and validate the compression spring steps. ELISAVA School provided a perfect setting for this experimentation, and we are very grateful for this opportunity.

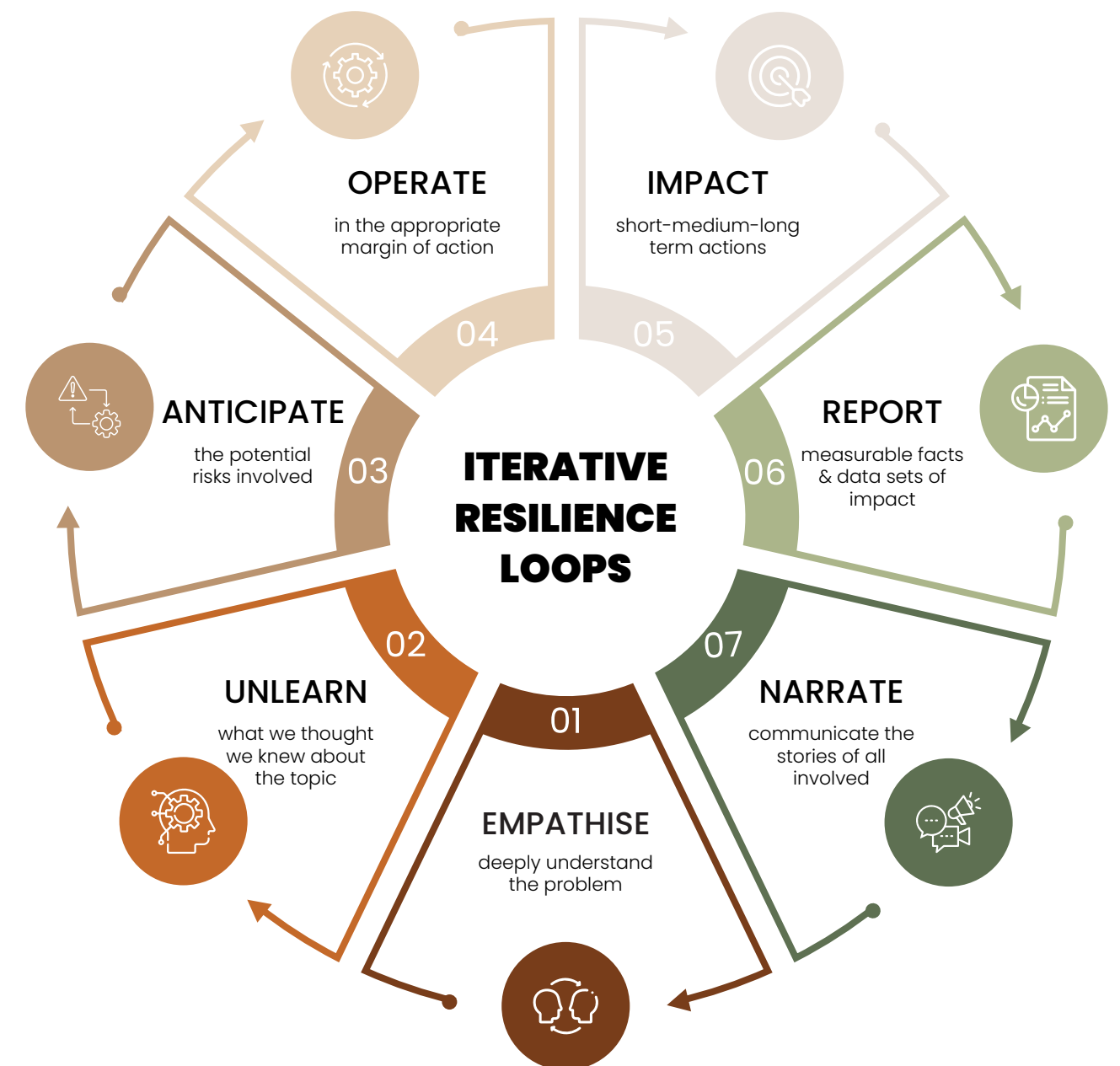


Fig. 6. Spring loops to building resilient design (Celaya & CARMAN, 2024).

Arianne Alzola Dominguez | Resilience Seminar Editor

Clasification table

	CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
01	SPIRE Smart Post-Industrial Regenerative Ecosystem	Dorin Miclaus	City Council Baia Mare	Baia Mare, Romania				   
02	From recycled wood to wall cladding	Acevedo, J. Cuevas, J.	Reviste start-Up	Valparaiso, Chile				  
03	Applying indigenous knowledge to road building on permafrost	Nikolaev, N.	The George Washington University	Yakutsk, Russia				  
04	Co-defining the city risks map	Gabàs, A.	Barcelona City Council	Barcelona, Spain				  
05	Creating healthy workspaces: Mipmari office refurbishment in Palo Alto co-working	Manresa, T.	Mipmari	Barcelona, Spain				  
06	Evolutive design in humanitarian shelter	Leboreiro, M.	UN Migration (IOM)	Burundi				 
07	Payments for Ecosystem Services (PES) in carbon sequestration monitoring: an innovative resilience building mechanism in the Sahel	Thomas, S.	OXFAM	Burkina Faso				  
08	Adapting to the new reality of the wine sector in the Mediterranean	Canals, R.	Vins El Cep	Penedès, Spain				 
09	Combating indoor air pollution with smokeless kitchens	Sans, M.	Awasuka	Rural Nepal				   
10	Introducing Bio-Hybrid Light Emitting Diodes (BIO-HLEDs): fluorescent proteins as an eco-friendly alternative to traditional lighting sources	Ferrara, S. Prof. Dr. Costa, R.D.	Technical University of Munich	Global				  

LEGEND:

 **APPROACH:** Development |  Innovation |  Triple Nexus

SCALE:  Territories |  Cities |  Spaces |  Product

SCOPE:  Policies & Strategy |  Practices |  Industry

Case Studies

Dorin Miclaus | Baia Mare City Council

SPIRE Smart Post-Industrial Regenerative Ecosystem | City Council, Baia Mare

#phytoremediation #adaptation #land

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
SPIRE Smart Post-Industrial Regenerative Ecosystem	Dorin Miclaus	City Council Baia Mare	Baia Mare, Romania				

01. EMPHATISE WITH THE PROBLEM

Baia Mare is a municipality along the Sasar River in northwestern Romania. The city is currently transitioning from its past as Romania's mining capital toward a new sustainable social, economic and environmental development model. The last metallurgical factory closed in 2012, and the city is now coping with a multi-dimensional set of challenges (including economic decline, depopulation, and environmental pollution). The mining and metallurgic industries left a legacy of circa 627 hectares of land polluted by heavy metals (up to 5 times the acceptable value) within the metropolitan area. Such land is now disconnected from the urban framework and a danger to the inhabitants and the environment; nonetheless, it is also an essential resource for Baia Mare's urban system's regeneration and sustainable economic development.

02. UNLEARN ABOUT ISSUES SOLVING

Following the municipal strategy (2008-2009), we defined the city's fight against pollution's effects as a priority. We started by participating in European projects in 2008, motivated by the fact that the fight against pollution and its effects was not a priority in Romania due to:

- The need to determine the degree of pollution and soil analyses is usually avoided because designating some land as polluted prevents construction or the use of these lands for other purposes.
- Eliminating pollution effects with plants (as we did) takes 10-25 years, depending on the level of contamination. The period is far too long for politicians and the community, who want results quickly.
- Getting decision-makers involved in such decontamination actions needs robust commitment and motivation from their side and a strong political will to overcome numerous obstacles and constraints.

03. ANTICIPATE AND ANALYSE RISKS

Adaptation resilience-building measures reduce a broad range of risks and carry many public benefits (including improving the environmental quality of air, water, and soil.) Increasing accessible green spaces is one of the critical features of adaptive cities that follow the WHO Urban Health Initiative (UHI), acting against urban pollution, promoting physical exercise, and leveraging the urban environment to promote physical and mental health. Data collection and predictive modelling help assess the effectiveness of phytoremediation strategies under different conditions. The Baia Mare's vulnerabilities are expected to be diminished, while the citizens' health is likely to be improved thanks to the actions undertaken.



Planting activities (Cluj, 2022)

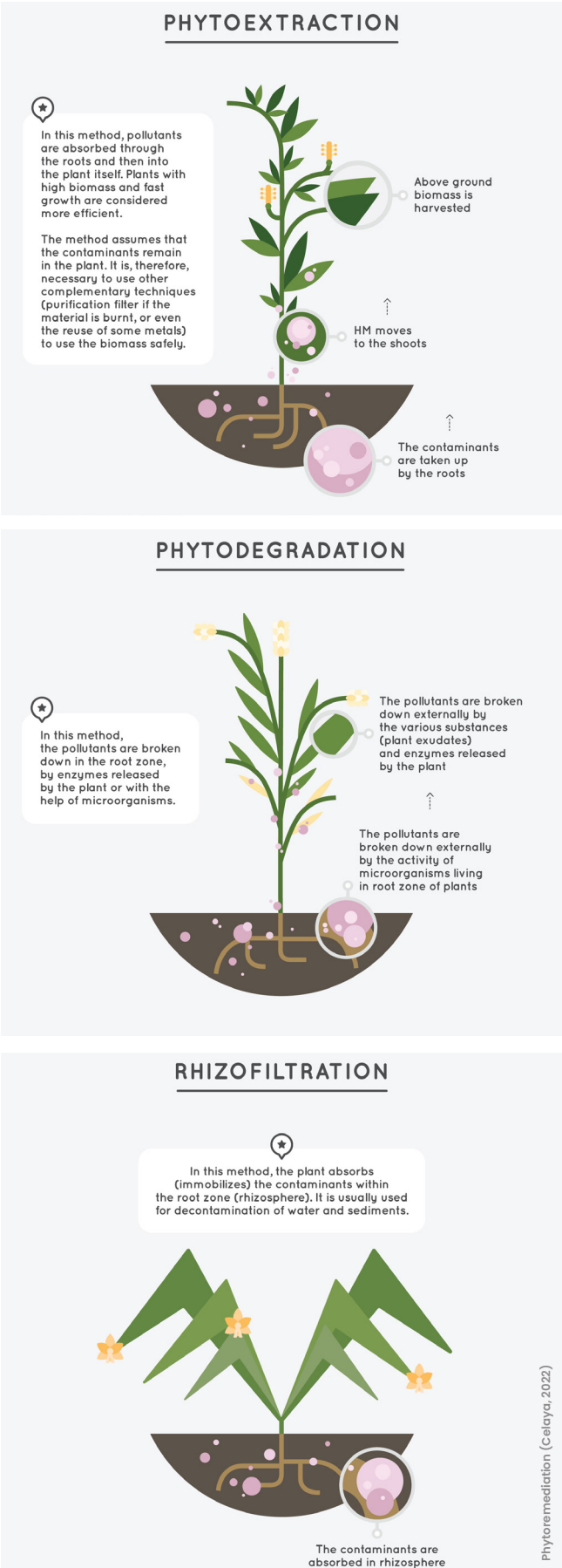
04. PROPOSE AND OPERATE

The project has been developed in three stages: from the initial benchmark and civic participatory activities through the implementation and phytoremediation process to the 2050 future metropolitan bio-based strategy and master plan.

STAGE 1: Citizen engagement and mentoring programmes. Citizen awareness, engagement, active participation, and co-creation processes were prioritised, including mentoring programmes for start-ups working on green business models. The Hub is an open space in a heritage building that can be used for meetings and other activities, ensuring the SPIRE spirit thrives.

STAGE 2: Nature-based Solutions and pilot sites, GIS and APPs technologies, and architectural heritage rehabilitation. SPIRE implements phytoremediation projects on five pilot sites, using plants to clean up contaminated land. This method is cost-effective and ecological compared to more common physical remediation methods. However, it requires more time and is a slower solution. The innovative GIS system locates the five pilot sites to show how they have become strategic green urban infrastructure. Based on blockchain technologies, the reward system, immaterial Local Environmental Utility (iLEU App) promotes environmental, health, and climate awareness.

STAGE 3: The Bio-Based Strategy and Masterplan 2050 for Circular Communities. This strategic policy document could be rolled out to other Romanian and international communities.



05. IMPACT

The estimated results proposed by the SPIRE project are based on the triple-bottom-line, along with risk reduction measures:

People: SPIRE has fostered awareness, commitment and knowledge about the environment and public health, involving stakeholders and citizens in sustainable practices.

Planet: SPIRE is improving soil quality and increasing green spaces through an adaptive agenda that combines phytoremediation techniques and landscaping strategies, delivering both short-term and long-term results.

Prosperity: SPIRE has harnessed underutilised local resources to stimulate the development of bio-based business models, green building materials, and bio-based energy, reducing the total GHG emissions in Baia Mare.

Since using plants to remove pollution from soil takes time and blocking land areas is not always politically desirable, ways should be found to replicate and scale these methods: New European policies on the matter could be a pathway to follow.

06. REPORT

We have been the first to show that phytoremediation works (in other experiments, the plants died, and they were not continued. It was concluded that if the contamination with heavy metals is very high, the plants do not survive, so they cannot extract the heavy metals from the soil). We insisted (we had six planting sessions) and observed a decrease in soil pollution with each new planting session until we reduced the pollution enough for the plants to survive. One crucial aspect to consider is how we can test whether plants can be used for various purposes, such as urban furniture, without harming human health after extracting pollution from the soil.

The first health benefits are that plants prevent dust pollution from rising into the air and that extracting pollutants from the soil reduces groundwater pollution.

07. NARRATE

During the communist period, our city was one of Romania's most polluted cities, and people got used to the pollution. In addition to experimental interventions, we had to find ways to change people's thinking. After previous approaches to European projects, we found that young people are more receptive, so we started first by involving students in all the planting activities, where we explained the role of plants in decontamination and why pollution is so dangerous. We have not yet reached the desired change in mentality, but we hope the community will slowly open its eyes.

There are alarm signals about the harmful effects on health, especially regarding lead. We need to convince doctors and medical professionals to help us explain pollution's adverse effects on health and persuade the community to expand phytoremediation throughout the cities affected.

SPIRE project has been implemented thanks to European funds under the Urban Innovative Actions (UIA) initiative and through a partnership composed of Baia Mare Municipality, the Transilvania Branch of the Romanian Association for Electronic Industry and Software, the Green Energy Association, the University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca, URBASOFIA SRL, Indeco Soft and the Baia Mare Metropolitan Area.



Joaquín Acevedo & Joaquín Cuevas | Reviste

From recycled wood to wall cladding | Reviste start-up, Chile

#wasterecycling #resource #reviste

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
From recycled wood to wall cladding	Acevedo, J. Cuevas, J.	Reviste start-up	Valparaiso, Chile				

01. EMPHATISE WITH THE PROBLEM

According to the World Economic Forum, the construction industry is accountable for about 35% of the global industrial solid waste (World Economic Forum, 2016). This enormous waste of materials has several negative consequences, such as overconsumption leading to increased resource extraction and low sector productivity.

In Chile, the lack of proper waste segregation at the source, coupled with the absence of suitable recycling markets and/or facilities, severely limits the potential for recycling these materials. Additionally, current legislation does not incentivize their reuse or recycling, resulting in illegal landfills controlled by informal actors and hindering the development of competitive recycling markets due to the low value of waste disposal.

02. UNLEARN ABOUT ISSUES SOLVING

How can a city be as generous as a forest? This complex question has countless possible answers. With Reviste, we aim to offer just one more perspective on this challenge. But what does it mean for a city to be as generous as a forest? Our current cities could be more open-handed, starting with the fact that they are supposed to be built upon principles of abundance. A generous city is one that harmoniously coexists with the natural environment, treating its residents as equals and cultivating prosperity for all, leaving no one behind. Unlike our degraded and polarised cities, a generous city takes care of people and the planet, and is regenerative and inclusive by design.



From waste to resource, design as a resilience and sustainability tool: demonstrating to the industry that separating and reusing / recycling / revalorising waste is profitable.



Wood siding (Reviste, 2023)

One way to build generous cities is to use design as a tool for resilient-based sustainability. Many of the products we consume are designed for single use or contain harmful ingredients manufactured with unethical methods. Such products are supposed to contribute to economic growth, but at what cost? Such a design is not regenerative and, therefore, will not support long-term prosperity. According to economist Kate Raworth, we need to start using design to combat the next decade's two big threats: the environmental crisis and inequality (Raworth, 2017). However, penetrating the industry and implementing new solutions is not easy. It requires collaboration and the creation of a resilient-based, sustainable ecosystem, a change at a cultural level, and a reflexive revolution around how we consume and build our living environments.

At Reviste, our primary focus is on environmental education. We aim to teach companies how to effectively segregate waste and instill the mindset that waste is not simply discarded material but a valuable resource. We strive to demonstrate to the industry that separating and reusing/recycling/revalorising waste is profitable. We act as designers inspired by the principle "form follows the resource", showing the market that making high-quality, sustainable products from waste is possible, competitive and commercially successful.

03. ANTICIPATE AND ANALYSE RISKS

Some of the identified risks include:

Legislative: Chile's legislation regarding waste disposal lags behind that of more developed countries, resulting in low costs for waste disposal. However, there are anticipated changes in the legislation that will increase the cost of disposal, ultimately benefiting recycling companies. It is

important to note that these changes may be implemented gradually and may not have an immediate impact.

Logistic: In Chile, waste collection is carried out locally, and transport is one of the highest costs in the process. Developing local micro-factories can be a solution to logistics, but it involves a greater risk in production quality control and associated costs to labour management.

Social: On the one hand, the vesting model addresses people deprived of liberty, many of whom are more vulnerable or may have psychological problems that, due to their condition, can complicate labour relations with them. On the other hand, the turnover within penitentiary facilities is high, presenting additional challenges in maintaining a stable workforce.

Market education: In Chile, the most critical purchase attribute is price. Due to a highly open economy, a wide variety of products are available at competitive prices, leading to intense price competition. However, the final customer often lacks awareness of the social and environmental impact of these products, as they are not widely associated with high costs or marked by sustainability practices.

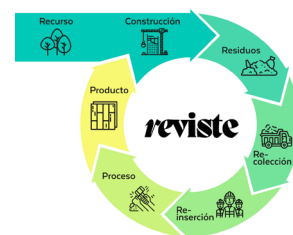


Fig. 7. Circular design diagram (Reviste, 2023).

04. PROPOSE AND OPERATE

Waste is a resource and an opportunity, not a problem. Reviste products are made from wood recovered sourced from industry and manufactured through a labour reinsertion programme within penitentiaries. They provide a local, environmentally, and socially responsible alternative to help offset carbon footprint. These products offer a sustainable option without sacrificing quality, design, or price.

Our mission involves educating companies on waste separation and transforming these resources into sustainable design products certified by the GBC, such as cladding or furniture. Our vision is to become the Chilean Ikea of circular economy and social innovation, all while preserving our forests. Beyond products, our focus is on transforming lives. We provide employment opportunities to individuals in correctional facilities, replicating our reintegration model across various regions. This initiative has been implemented as a service to offset the environmental impact in companies such as Minera Escondida, Arauco, Tecnofast and Redbull. These and other companies have already joined the challenge of building more generous cities by giving wood, people and the planet a second chance.

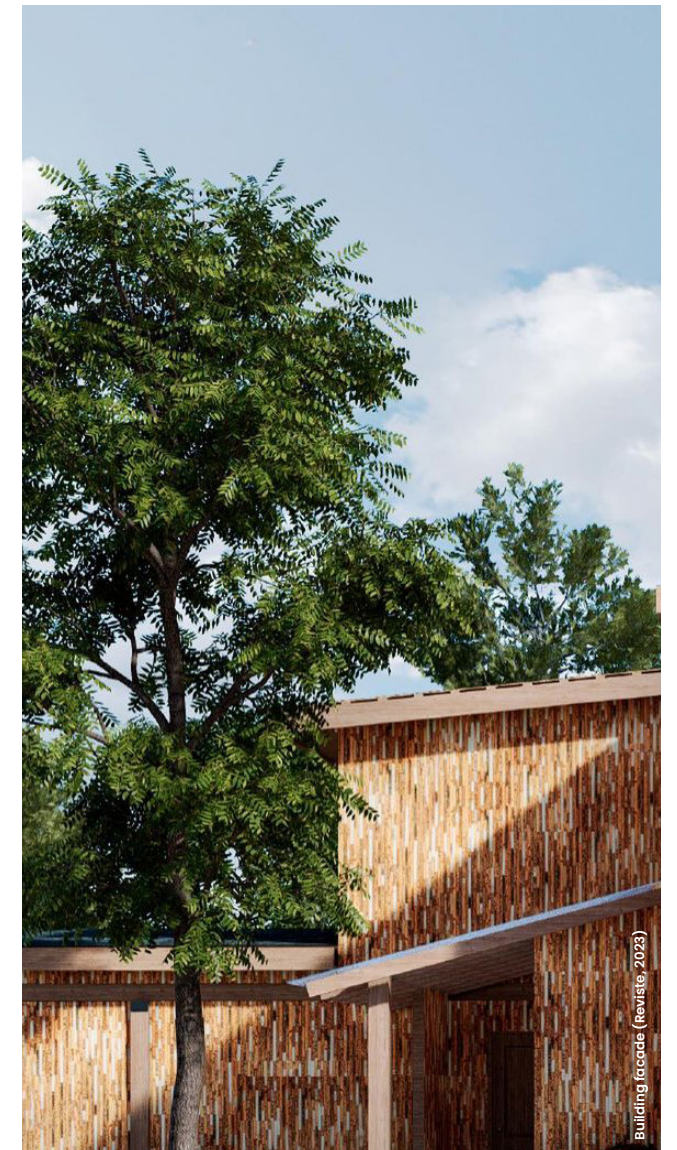
Through these programs, inmates receive carpentering training through Reviste workshops and are compensated for their work. And more importantly, we are developing a program to provide educational benefits for the families of these inmates. By doing so, we are breaking a vicious circle and fostering a virtuous one, giving real education chances and job opportunities to vulnerable families. We have also created a circular economy implementation service within companies that generate wood waste to offset the environmental impact and create new products that can be used in the companies' internal processes or sold through Reviste's sales channels.

05 / 06. ACHIEVE IMPACT AND REPORT ON IT

The impact of Reviste has three main components: social, environmental and economic resilient-based sustainability.

Social: In Chile, crime is a serious problem. The current prison model proved ineffective in the long term, since the recidivism rate is 50%, which means that 5 out of 10 people who are released commit crimes again. Thanks to Reviste's reintegration programs, this rate is reduced to 22%, which shows that Reviste's products can reduce crime in Chile by providing inmates with practical working tools.

Environmental: In Chile, there are few or almost no alternatives for recycling wood, which is counterproductive in a country that is a primarily timber producer. This is why the wood ends up being burned or buried, which implies a large release of CO₂ or even CH₄ due to the wood decomposition process.



Building facade (Reviste, 2023)

This is why recovering wood prolongs the useful life of wood for CO₂ sequestration: by using our products, the extraction of new raw materials and the large amount of CO₂ emitted by transport are avoided since 95% of the coating materials sold in Chile are imported.

Economic: The economic impact stems from the development of local economies through the use of local waste, labor, and marketing efforts. Value is added to a material which is typically deemed to have zero economic value. Reviste has managed to create alliances with companies such as RECYLINK, which measure the impact through a digital platform. The company is immersed in searching for resources to pay for a carbon footprint study or circularity analysis.

07. NARRATE

Our minimum viable product, a siding, was chosen for its unique visibility and the significant impact it has in terms of the volume of reclaimed wood used and hours of labour required. This is not a mere craft made from reclaimed wood, but a strategic move to position ourselves within the industry, validating our model of circular economy and social innovation.

The wall cladding surfaces in a real estate project we focus on represent a substantial value of the project's budget, totalling approximately 4.6%. Considering the significant annual investment in the construction industry in Chile, this is a considerable amount.

This approach allows us to recover large volumes of wood, transforming it into a product that is produced also in large quantities, thereby making a real impact on the environment and people. We have invested substantial resources in the communication strategy for this project in order to reach the industry, amplify our message to companies, and collaborate to create essential changes. Through strategic storytelling and targeted marketing, we aim to drive change that is not only impactful but also scalable and replicable in other contexts.

Without the ability to sell our products, our operations in Chile would be severely limited. Unfortunately, the government lacks the resources to provide the funding and infrastructure needed to address this issue. The private sector is the most agile way to act and transform words into action; despite the challenges in communication, the narrative has taken root and progress is underway. Our products are already being sold and marketed in large retail stores in Chile, such as Sodimac, and all this is thanks to the power of storytelling that inspires others to join the project and build a sustainable ecosystems in the region.



Nikolay Nikolaev | The George Washington University

Applying indigenous knowledge to roadbuilding on permafrost

| The George Washington University, Yakutsk

#tradition #adaptation #indigenousknowledge

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Applying indigenous knowledge to road building on permafrost	Nikolaev, N.	The George Washington University	Yakutsk, Russia				

01. EMPHATISE WITH THE PROBLEM

This case study addresses the challenge of building accessible and durable roads in Yakutsk, a city in the Russian Far East known for its harsh permafrost conditions and severe scarcity of conventional building materials such as stone. These roads were crucial for ensuring connectivity and mobility for the inhabitants of the region.

The innovative and resilient use of wood in road construction was introduced in Yakutsk in the early 1920s and continued until the 1960s. The solution catered to the needs of both modern vehicular traffic and traditional horse-drawn transportation. The knowledge came from rank-and-file members of the communist party and local administrations (predominantly Sakha people).

Drawing on their experience with working with larch wood in the Sakha countryside, where the majority of wooden “temporary” housing is constructed from this material, they decided to adapt the use of this material to urban settings.

The primary beneficiaries of this decision were the city’s urban dwellers. This innovative solution entailed sourcing round pieces of wood from local forests to build a durable foundation for custom designed roads and sidewalks. The remaining gaps were filled with mortar to ensure resilience against the changing permafrost conditions.

02. UNLEARN ABOUT ISSUES SOLVING

Yakutsk’s geographic location in the Siberian region makes it one of the coldest cities on Earth, with average winter temperatures ranging from approximately -30°C to -40°C, occasionally reaching below -50°C in winter, significantly influencing both the lifestyle of its residents and the strategies employed for urban development (UN Habitat, 2024). The presence of permafrost in the ground demands innovative and unconventional approaches to infrastructure development. The Soviet period added another layer to the context: extreme centralisation and over-reliance on engineers from the capital, Moscow.

A common misconception at the time was that permafrost regions were not suitable for supporting major road infrastructure, such as asphalt. In addition, the wood was seen as not suitable material for road infrastructure. The pieces of larch seemed to petrify due to their proximity to permafrost, but there was a lack of scientific data. Yakutsk’s successful implementation of resilient-based sustainable development demonstrates that with careful planning and nature-based approaches, infrastructure is feasible in these challenging environments.

Yakutsk project ingeniously recovers traditional solutions as a great example of adaptability and resilience.



03. ANTICIPATE AND ANALYSE RISKS

The project's SWOT analysis reveals various factors: Strengths include the use of local materials and adaptation to extreme climates, while Weaknesses such as higher maintenance demands and limited scalability, present potential challenges. Opportunities exist to develop innovative engineering solutions and enhance local knowledge, yet Threats emerge from climate change impacts and technological/economic constraints.

Risk mapping highlights natural risks like permafrost instability, societal risks stemming from limited economic resources, and technological challenges.

Stakeholder mapping identifies key players such as Republican and local government, elected officials, urban planners, and residents, whose interconnections involve resource allocation, and community engagement, potentially including social reintegration.

By aligning these analyses, the city (and stakeholders such as urban planners and residents together with the local government) can leverage Strengths to mitigate Weaknesses, capitalise on Opportunities, and address Threats while fostering stakeholder collaboration for sustainable project outcomes. Policy development can be a potential next step to ensure long-term success.



04. PROPOSE AND OPERATE

The solution involved a multi-step process, starting with the first layer of gravel of various sizes as the base, followed by a layer of sand. Afterwards came the layer of locally sourced wood (Siberian larch), cut into circular shapes to construct stable, well-insulated roads and sidewalks.

The final step involved filling any remaining gaps with mortar. The larch wood is known for its resistance to rotting, making it well-suited to endure the Yakutian mud seasons and the salinity of local soils. Aside from this exceptional quality, larch is the most prevalent tree in the region so there are not many other options. There is an intrinsic knowledge of the necessary drying time for the wood before it can be used, typically requiring a minimum of one year.

The construction process was relatively straightforward and was carried out by a "voluntary-forced" workforce of employees from state organisations. These individuals were technically given a choice to participate, but in reality, there was an expectation for them to contribute.

As a result, the work was completed by non-professional road workers, with each organisation assigned specific quotas for the lengths of road they were responsible for building. Unfortunately, many organisations neglected to meet these quotas or simply ignored the task altogether, as evidenced by reports in newspapers from that period.

05 / 06. ACHIEVE IMPACT AND REPORT ON IT

There are no specific indicators linked to these practices; however, they include aspects such as local resource allocation and the potential of nature-based solutions, recyclability, cost-effectiveness, road lifespan, maintenance frequency, and user satisfaction.

The short-term effects of this innovative approach were marked by improved mobility and accessibility. In the mid-term, this solution transitioned to conventional methods such as asphalt. However, the long-term effects are particularly promising, offering valuable insights for other permafrost regions and potential climate adaptation strategies.

This case aligns with the principles of the Sendai Agenda for Disaster Risk Reduction, the Paris Agreement, the Sustainable Development Goals, the New Urban Agenda and the use of indigenous knowledge.

07. NARRATE

The case of Yakutsk serves as a unique example of infrastructure development in one of the most extreme climates on Earth, showcasing the innovative use of local resources and traditional knowledge. The key lessons learned from the Yakutsk case study offer practical implications for urban engineering, underlining the importance of adaptation to local conditions, the value of indigenous knowledge in addressing community challenges, and the essential role of innovation in tackling the impacts of climate change.

Nowadays, this practice is used as a private, mainly aesthetic solution for single-family housing plots. It is recommended to conduct further research, explore potential technological integration, and develop strategies to address similar challenges in other permafrost regions.

Using indigenous expertise through design as a way to build resilience and preserve traditional knowledge.



Ares Gabàs Masip | Barcelona City Council

Co-defining the city risks map | City Council, Barcelona

#risk #co-design #cities

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Co-defining the city risks map	Gabàs, A.	Barcelona City Council	Barcelona, Spain				



01. EMPHATISE WITH THE PROBLEM

Local Government decisions in urban planning, as well as setting transformation and investment priorities, have a long-lasting impact on the future of cities. Making sure these decisions can address current and future risks and challenges, such as extreme weather events intensified by climate change, technological threats, or demographic shifts and migrations that can significantly alter the profile of a city, is crucial for sustainable and resilient urban development.

City governments need to identify and understand their risks, including potential hazards, exposure and vulnerabilities, and use this knowledge to inform their decision-making processes.

According to the Sendai Framework for Disaster Risk Reduction's Priorities for Action, disaster risk management must be based on an understanding of disaster risk in all its dimensions of vulnerability, capacity, exposure of persons and assets, hazard characteristics and the environment (UNDRR, 2015). Cities need to transition from a traditional reactive approach to risk management to a proactive one that increases the safety of their citizens, protects their built and natural environment, and ensures the continuity of their services.



02. UNLEARN ABOUT ISSUES SOLVING

Currently, there is a lack of data on risks and holistic vulnerability approaches that city managers and decision-makers can use to prioritise efforts and allocate resources effectively. The complex and changing nature of risks, as well as uncertainty in projecting future scenarios and assessing vulnerabilities, further complicates the identification of most pressing challenges.

Moreover, city competencies are distributed among several actors and therefore, effective resilience building requires extensive stakeholder engagement and participation. This project focused on drafting a risk map for the city and defining a corresponding municipal action plan. A participatory process was considered essential in order to establish a consensus on risk prioritization and the subsequent action plan, with adequate representation from all City Council departments.

03. ANTICIPATE AND ANALYSE RISKS

To the best of our knowledge, this was the first time that a city carried out such a participatory process, and so we had no references or benchmarks we could learn from or draw upon for inspiration. Given the complexity of the topic, there was an inherent risk that the project's purpose could easily be misunderstood. To navigate it, we implemented a robust communication strategy.

A successful outcome depended on a high level of participation and adequate representation from all relevant departments. Failing to achieve it could have jeopardised the credibility of the Resilience Department's work and led to disengagement in the city's resilience strategy development and implementation.

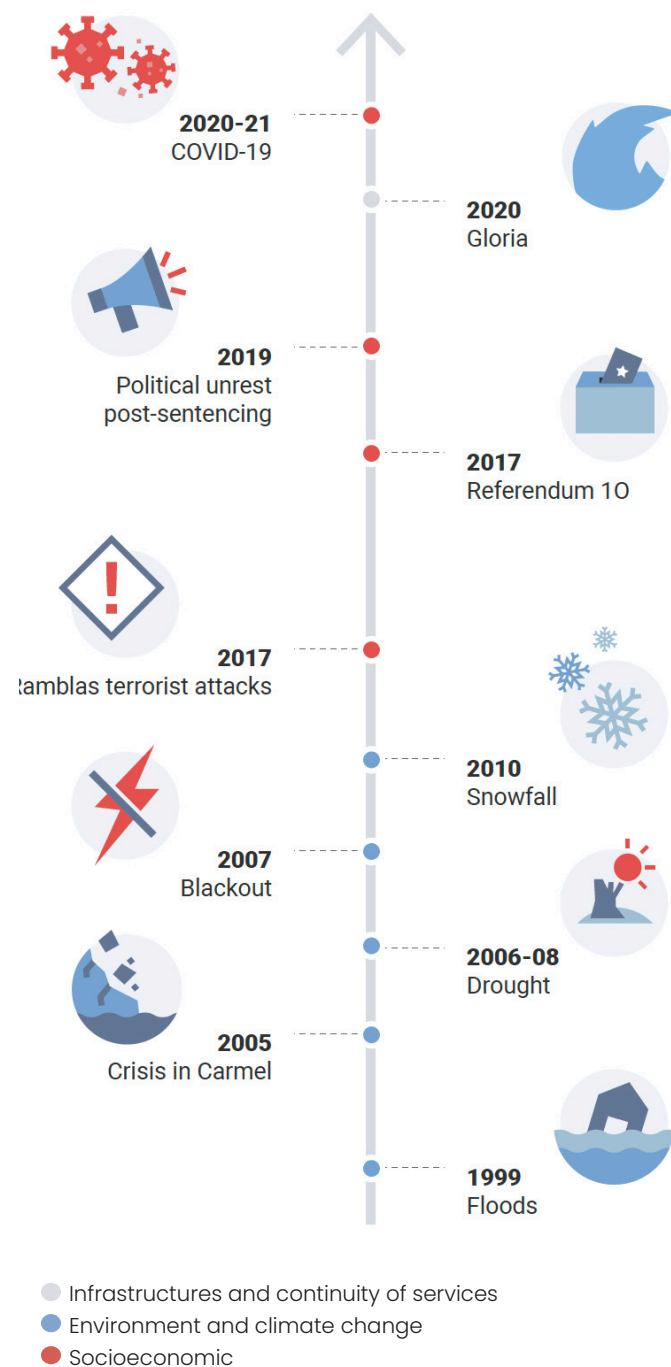


Fig. 8. Critical episodes timeline (Barcelona Resilience Department, 2022).



04. PROPOSE AND OPERATE

The team designed and implemented a co-production process to draft Barcelona's risks map. This participatory process was integral in finalising the city's resilience strategy diagnosis and served as a foundation for co-designing an action plan closely aligned with the findings of the analysis.

The process included a two-phased online survey followed by a final in-person workshop. The target audience was technical municipal staff with varying backgrounds, fields of expertise, as well as levels of familiarity with the urban resilience concept and the work of the Resilience Department.

Hence, one of the main challenges was the lack of a common language or shared conceptual framework and understanding of resilience and related approaches. Given the topic's complexity, the comprehensive and holistic target required a thorough design of the engagement and participation process and selection of tools. It was essential to ensure the objectives of the process were very clear and deployed in the easiest and most accessible way.

05. IMPACT

Along with Barcelona's resilience diagnosis and the co-production of the city's risks map, side outcomes and added value of the project include the following:

- Increased stakeholder engagement for further development of the resilience strategy.
- Promotion of resilience thinking within the organisation, establishing a common language and conceptual framework.
- Built co-responsibility and enhanced understanding and awareness of the complex and volatile risk landscape, including challenges such as decision-making with uncertainty, difficulties in applying a global vision and adopting systemic approach as well as assessing trade-offs, etc.
- Dissemination of the work of the Resilience Department and visualisation of the city's resilience agenda.
- Evolution of urban resilience concepts towards a shared understanding of how to address resilience at the municipal level.

It is recommended to gain stakeholder commitment to carry out further steps in developing the resilience strategy.

06. REPORT

This project aimed to increase knowledge to inform decision-making processes and eventually contribute to the design of a solid indicators system. Due to the need for more availability of quantitative data, the online survey was designed to gather and maximize the value of qualitative inputs from the participants.

The primary goal was achieved by providing a thorough evaluation criteria to the participants. These criteria guaranteed a minimum desirable level of homogeneity in the responses and reduced subjectivity. The process was designed to allow for future replication and potential involvement of other stakeholders such as neighbours and civil society, various administrative levels, and other actors. Iteration of such participatory processes would enrich and allow updating the results and tracking their evolution.

Other potential outputs of the project included:

- Generated knowledge and improved predictive capacity by identifying patterns and trends as the historical data and database expand.
- Contribution to defining impact and monitoring indicators for the resilience action plan and future risks and vulnerabilities.
- Transition from qualitative to quantitative data by emphasising the importance of data collection and creating a more advanced data culture within the organization.



Fig. 9. Internal participatory process on-line survey (Barcelona Resilience Department, 2022).

07. NARRATE

Investing time and effort into developing a well-designed methodology and tools was essential to achieve a good level of involvement of the participants. At the same time, a high level of knowledge of the organization and the target audience was also a key success factor.

Designing and implementing a good communication strategy to ensure the goal and purpose of the participatory process were clear and well understood was of utmost relevance, especially to overcome time and planning constraints. A high level of involvement of the project team and consistent process follow-up was also crucial.

While the methodology was successful, there is always room for improvement in future editions, incorporating lessons learned from this first implementation. The survey and workshop participants' feedback will allow for necessary adjustments and enhancements in the future.

The project fosters co-responsibility and a greater understanding and awareness of the complexity and volatility of the risk landscape in the city of Barcelona.

Txell Manresa | Mipmari

Creation of healthy workspaces, office refurbishment at Palo Alto coworking | Mipmari, Barcelona

#health #designcriteria #well-being

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Creating healthy workspaces: Mipmari office refurbishment in Palo Alto co-working	Manresa, T.	Mipmari	Barcelona, Spain				

01. EMPHATISE WITH THE PROBLEM

The spaces where we live and work closely relate to the body's balance. Until about 25 years ago, science thought genetics would give us the patterns of knowledge to solve diseases. Today, it has been established that the environment in which we live plays a crucial role in shaping our health and well-being, often exerting even greater influence than genetic factors (PAHO & WHO, 2023). According to the reports, the postal code often impacts a person's state of health more than the genetic code itself; that is to say, the environment in which we live acts as a determinant of health.

The relationship between the environment and personal habits generates a series of biological responses that condition our state of health. Factors such as alteration of the intestinal flora, stress and inflammation can all be directly influenced by this relationship (Robbins & Wiechelt, 2004).

Therefore, if we could create balanced and harmonious environments, it would be possible for us to be healthier. The refurbishment of Mipmari's headquarters in Barcelona is designed, among other aspects, to accomplish this balance.

02. UNLEARN ABOUT ISSUES SOLVING

The proposal makes us rethink the aspects that must be considered when analysing space distribution, materials selection, and facilities design. Typically, these decisions are based on factors such as space optimisation, textures, colors, aesthetic criteria, well-known brands, maintenance, cost-effectiveness, etc.

It is necessary to add other layers of information accompanied by new criteria. It could lead to a potential invalidation of some of the previous indicators due to the primary need to implement a healthy proposal for people and the planet.

Some of the usual inertias revised within the project are:

Space distribution: Beyond usual functionality, the drafted geobiology study and site proportions based on sacred geometry have been analysed.

Materials selection: Beyond colour and texture, materials toxicity related to the number of VOCs (Volatile Organic Compounds) emitted, the accumulation of static electricity, etc., have been considered.

Furniture design: Beyond aesthetics, location-related geometry, generatin harmonious latitude-determined proportions, has been evaluated.

Electric system: Beyond the flexibility and possible space redistribution, EMF (electromotive force) have been removed and both natural and artificial lighting incorporate chronobiology.

Heating system: Beyond searching for heating and cooling schemes, the natural ways the human body receives and loses temperature and humidity, as well as material space conditions, have been included.



03. ANTICIPATE AND ANALYSE RISKS

The current dynamics in architecture and construction often fall short of addressing healthy and environmentally sustainable interventions. We have made a significant and collaborative effort to engage all the agents involved in the project and construction process.

It has been difficult to find technical information that helps decision-making. Existing regulations do not adequately address primary health aspects, the costs of sustainable solutions are usually higher than conventional ones, and there is a lack of knowledge about traditional and local techniques and materials. It is imperative to find the balance between sustainability and health, as they do not always align; some techniques require more time than usual, and must be properly planned to avoid invalidation

Despite this range of setbacks and challenges, the loft refurbishment has been a fantastic exercise in applying new criteria and logics that will continue to influence our future practices.

Beyond conventional criteria, additional factors were applied when designing the space, such as health studies, geobiology and sacred geometry.

04. PROPOSE AND OPERATE

The intervention in Palo Alto's loft aims to solve the encountered previous space drawbacks, such as lack of natural light and insufficient artificial light; working spaces rigidity and quality unbalance (a single and linear table that does not allow reorganizations, different relation to natural light and views, etc.) and lack of meeting spaces.

The room for action lies in the re-distribution and interior conditioning:

Space distribution: Water currents were detected with permanent workplaces located to avoid them. Working and common spaces are combined, generating harmonious proportions that improve aspects such as concentration and well-being.

Materials selection: The existing walls have been plastered with original lime, which helps regulate temperature and humidity. The new walls are plant-based, painted with soya—completely VOCs-free.

Furniture design: The working desks follow harmonious proportions in relation to the geographical location, according to solar geometry, both in terms of table size and height.

Electric system: To reduce EMFs, the entire installation has been made with shielded cabling, as well as the power strips on the tables, the computer connections, and the lamps. The general ship grounding ensures that the system drifts correctly

Heating system: A convention radiator system (similar to the sun) has been installed, as it is the most suitable for people's health, while favoring and taking advantage of the inertia of the stone walls.

A large amount of natural light enters the space to regulate the body's circadian cycle. The artificial light is made out of lamps with ICR>90 and color temperature of 2700K to avoid chronodisruption.

05. IMPACT

We have not been in the new space long enough to gather all the information needed to thoroughly analyse the results. Our personal experiences suggest that daily work changes naturally in a well-lit space. Changes in the amount of light and shadows, like the connection with the time of day, have a positive influence on mood and the ability to concentrate.

We can also observe how the significant change in the spatial amplitude (coming from below to above the mezzanine) promotes a sense of sensorial and psychological well-being.

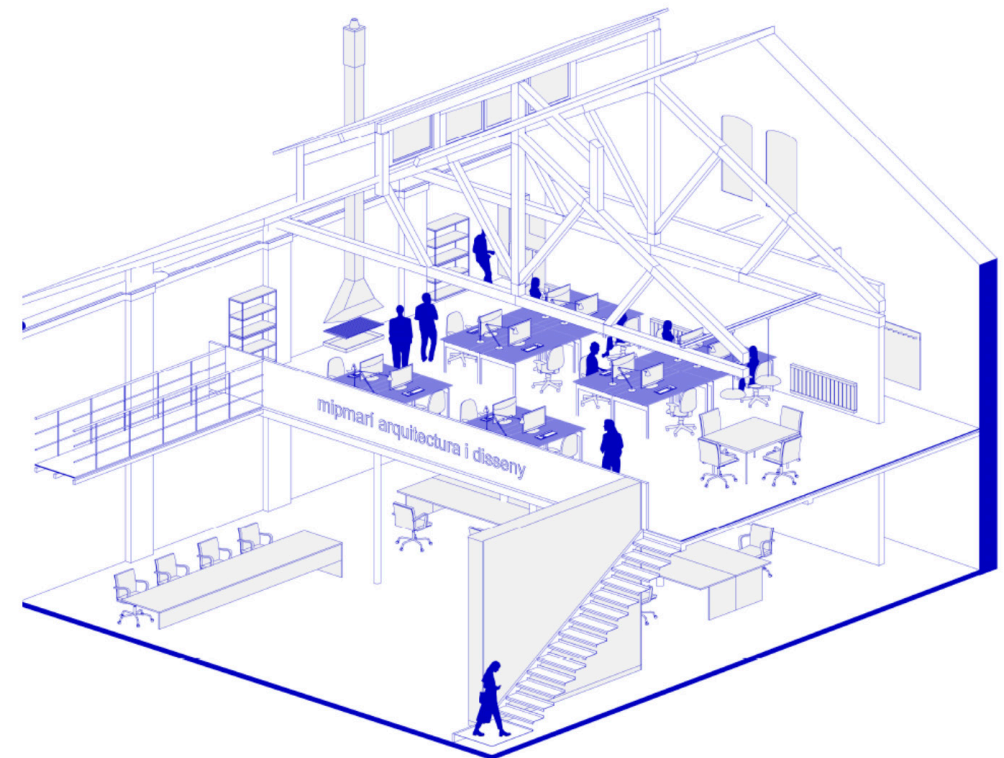


Fig. 10. Palo Alto office's axonometry (Mipmarí, 2023)

06. REPORT

The reference standard to assess indoor air quality is the SBN-2015. Within it, indicative values from not significant to highly significant impact on people’s health are regulated for so-called “places of high permanence”. The analysed aspects are the following: alternating and continuous EMFs, electromagnetic waves, radioactivity, geological disturbances, formaldehyde, VOC solvents, pesticides and other less volatile polluting agents, relative humidity, ions, and atmospheric electricity.

Other references are the ISTAS list, the RISCTOX database, and the French standard for labelling emissions at indoor air. They helped us choose materials that meet certain standards. So far, the ESP mandatory regulations only recognise the impact of radon gas. However, the values applied in the regulations are above WHO recommendations. As far as EMC is concerned, the normative values are far above the bioconstruction recommendations.



Loft with tree, fireplace and natural light (Mipmari, 2024)

07. NARRATE

It is clear that how we plan urban, public, private, outdoor and indoor spaces determines users’ spatial dynamics, comfort and lifestyle and, therefore, people’s health. Concepts such as sustainability, consciousness, ethics, well-being and collaboration should be fundamental principles embedded in the DNA of all future healthy spaces design and construction.

The spaces we inhabit influence our wellbeing through a series of biological responses that determine our state of health.



Palo Alto Barcelona (Mipmari, 2024)

Marta Leboreiro Núñez | IOM UN Migration

Evoluteive design in humanitarian shelter

| IOM UN Migration, Burundi

#shelter #evoluteive #transition

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Evoluteive design in humanitarian shelter	Leboreiro, M.	UN Migration (IOM)	Burundi				

01. EMPHATISE WITH THE PROBLEM

Disasters frequently lead to significant shelter damage, causing people to lose their homes and depriving them of their right to adequate housing. The traditional humanitarian shelter assistance model frequently falls short in addressing these challenges. While emergency responses are crucial for protecting and saving lives, they may not effectively support communities and individuals in their transition and recovery. Humanitarian early response typically centers on one-time item(s) distribution, which sometimes fail to provide continued support and monitoring, which can hinder the beneficiaries from finding durable solutions or even exacerbate the situation.



Natural disaster in Mozambique (Leboreiro, 2019)

02. UNLEARN ABOUT ISSUES SOLVING

In the aftermath of disasters, people may experience recovery at different rates, requiring tailored support. Harmonization beyond homogeneity is a primary reflection humanitarian programmes must address. Adaptability and flexibility allow programmes to cater to diverse recovery phases, bridging gaps and fostering long-term and durable solutions that could be mainstreamed with the post-crisis sustainable strategies proposed. Why not consider temporary shelters that could be “perfectible” and evolve over time, transitioning to durable materials, expanding living spaces, and enhancing resilience through skill acquisition?



Runge Camps, Burundi (Ashmore, 2016)

“Shelter” is the household living space, including the items necessary to support daily activities.

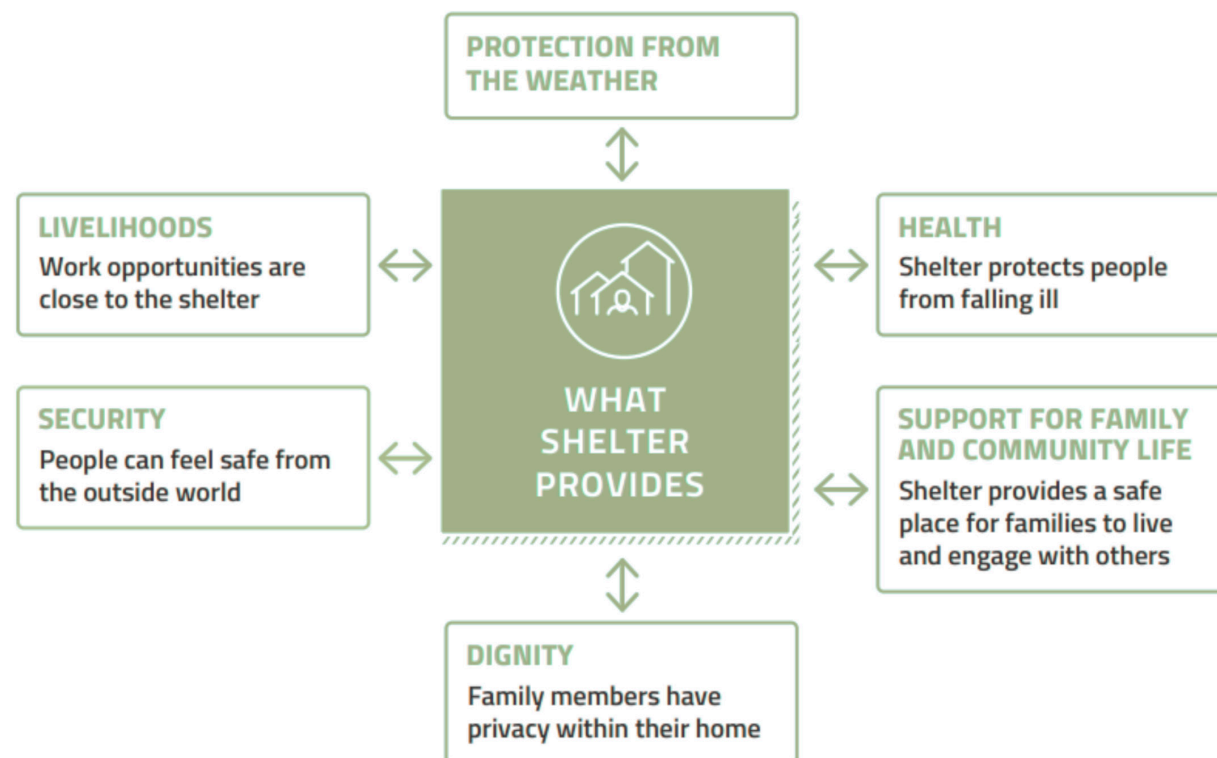


Fig. 11. What shelter provides. (Sphere, 2018).

03. ANTICIPATE AND ANALYSE RISKS

In this context, a significant risk is the reliance on multiple actors and organizations for support, which may lead to coordination challenges. In complex operations involving various stakeholders, effective communication or alignment of priorities are crucial to ensure an efficient project execution.

Additionally, the dependence on community engagement, involvement, and training capacities might pose a risk if there is resistance or a severe lack of capacity within the affected population. Moreover, challenges may arise in the use of local materials and tapping into local construction expertise if resources or skilled labor are scarce.

When evaluating the potential risks of our proposal, it is important to recognize possible challenges in the design, construction, and implementation phases due to the necessity for community participation and capacity building. These challenges could lead to extended periods of inadequate shelter for affected populations, especially if the training processes are not effectively managed.

Furthermore, transitioning to more durable shelter solutions may inadvertently exclude certain vulnerable groups who lack resources or skills to participate in the construction process.

04. PROPOSE AND OPERATE

This case study outlines proposed solutions in humanitarian shelter contexts using examples from Burundi during both emergency and transition phases. These solutions include improving temporary shelters, transitioning to durable materials, expanding living spaces, and building resilience through skill acquisition. Further insights into the long-term sustainability and impact of these solutions have yet to be fully disclosed.

The process aims to improve household living conditions in temporary settlements, by first upgrading shelters during the emergency phase, in alignment with adaptable and sustainable shelter interventions, progressing beyond top-down temporary solutions towards bottom-up and durable approaches. This flexible, community-focused strategy empowers individuals and households to better withstand and recover from crises.

05. IMPACT

These proposed solutions aim to build resilient communities that are better prepared for future critical events while also reducing construction times. The approach provides a safe and dignified space for affected households by allowing for modifications and expansions to enhance the original shelter design.

In addition to providing emergency shelters that can be improved, the activities include distributing shelter construction kits, implementing community engagement strategies in shelter design, conducting capacity-building programmes, establishing cost-sharing mechanisms, and offering cash incentives for construction. The project supports the development of more permanent housing solutions while ensuring early recovery, social cohesion, resilience, and community stability.



Average: **500 USD** (up to 1.500 USD more durable)



Average **150 – 200 USD** (including cash grants)

Evolutionary design allows us to improve, expand and build more durable solutions to increase the resilience of the people who will live in humanitarian shelter.



1. Original shelter was meant to be temporary, designed to be modified in the future.



2. The community was trained to modify the shelters thanks to technical training and through a participatory design process of the shelter.



3. Durable Shelters that can be called homes are achieved by the community itself with little external support.

06 / 07. REPORT AND NARRATE

A key take-away from this experimental design was recognising the crucial role of a well-planned timeline for implementing Transition and Recovery projects. Rushing the process can undermine the sustainable approach needed for lasting success. While a 3 month project can yield some results, the quality of interventions such as counseling, engagement, support, and training may be compromised. Achieving sustainable reintegration requires long-term thinking, highlighting the need for thorough monitoring and continuous learning to ensure effectiveness.

This project in Rumonge (Burundi) illustrates how the concept of resilience can develop over time. Initially, transitional shelters were established as temporary solutions. However, through communal effort and with minimal external support, the shelters evolved into sustainable dwelling, showcasing the power of community-driven initiatives in building lasting resilience.



Sébastien Thomas | OXFAM Intermón

Payments for Ecosystem Services (PES) for carbon sequestration monitoring innovative resilience building mechanism in the Sahel | OXFAM Intermón, Burkina Fasso

#regreening #youthclimateaction #climatejustice

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Payments for Ecosystem Services (PES) in carbon sequestration monitoring: an innovative resilience building mechanism in the Sahel	Thomas, S.	OXFAM	Burkina Faso				

01. EMPHATISE WITH THE PROBLEM

The Sahel region is one of the most vulnerable areas to climate change, with immediate and severe impacts. In countries like Burkina Faso and Niger, daily reality for many people is shaped by a myriad of interconnected challenges including desertification, soil degradation, extreme poverty, food insecurity and conflict. Additionally, systemic discrimination, the disempowerment of women and young people, and insufficient climate finance all contribute to compounding the problem, fueling a cycle of poverty and vulnerability.

Households in Burkina Faso and Niger often struggle to secure enough food, resulting in malnutrition and hindering childrens’ development. Poverty prevents people from investing in improving their agricultural methods or reclaiming degraded land. Political instability, as seen through a string of coups in recent years in both countries, coupled with competition for scarce resources, is likely to spark conflicts that further destabilise societies and prevent dealing with the root causes of environmental and economic issues.

A lack of climate finance is a major obstacle to the growth of environmental and resilience projects in West Africa. Whereas the region suffers from an urgent need for robust financing to adapt to climate impacts and ensure resilient-based sustainable development, it receives only a fraction of needed financial support (GEF Secretariat, 2023).

This lack of funding deepens the vicious cycle of poverty and environmental degradation. A recent Oxfam study reveals that, despite the pledges and commitments of polluter states under the Paris Agreement, Sahelian countries have only received about 7% of the necessary climate action funding outlined in their Nationally Determined Contributions (NDCs) goals over the past decade. Furthermore, the majority of this funding comes in the form of loans that will have to be repaid with interest (OXFAM, 2022).

The Paid Environmental Services (PES) provides a practical and impactful solution to combat land degradation and poverty in the Sahel region, specifically in Burkina Faso and Niger. This pilot project tests the technology and social impact of PES in poor communities, addressing desertification, enhancing soil fertility, reducing poverty (through direct financial contributions as a new source of income), and contributing to global climate change mitigation.

By implementing Paid Environmental Services (PES), the initiative promotes climate justice, ensuring that the most affected communities are compensated for their efforts to regenerate their environment.



Learning workshops (JESAC, 2024)

02. UNLEARN ABOUT ISSUES SOLVING

The Sahel is hardly the ideal place in the world to plant trees and sequester CO₂, but trees and reforestation are crucial for local ecosystems and people's resilience. The literature review and carbon sequestration estimation within the Sahel landscape have illustrated a general underestimation of carbon in semi-arid landscapes, which has implications for the potentiality of carbon sequestration activity in the region.

The carbon market lacks transparency and requires a standardised verification system, and reforestation and compensation schemes often suffer from lax monitoring, making it hard to ensure their effectiveness and fairness. Faced with these challenges, we considered piloting innovative solutions in the Sahel region.

03. ANTICIPATE AND ANALYSE RISKS

In this region of West Africa, particularly in Burkina Faso and Niger, communities face severe natural, societal, and economic challenges. Droughts, floods, animal divagation, climate change, high temperatures, and pest infestations disrupt daily life and agriculture.

These issues create a vicious circle that perpetuates extreme poverty: average incomes of around 350 euros per year for impoverished households (UNDP, 2024), food insecurity, political instability, terrorism, and violence. The key challenge

is to design a system that can navigate this risky environment and provide a complementary livelihood and additional source of income by incentivising the preservation and care of trees.

04. PROPOSE AND OPERATE

The project aims to improve climate governance and combat land degradation in Burkina Faso and Niger by promoting agroforestry and implementing Paid Environmental Services (PES) for people in vulnerable situations. It includes agroforestry training, nurseries, land negotiation, and satellite and earth observation systems for measuring carbon sequestration. The project supports tree planting, monitors carbon sequestration with trained algorithms, and provides income to affected communities. The innovative aspect involves testing technology and social impact of Paid Environmental Services (PES), leveraging satellite technology, digital payments, blockchain certification, and transparency to find climate solutions and create new livelihood models.

The project involves multiple stakeholders, including farmers' cooperatives (Mooribem and Viim Baore), youth organizations (A2E, RJNCC), private sector partners (Lobelia and Caelum), and local authorities, under the Great Green Wall Initiative, supported by the EU and AU EU Youth Cooperation Lab.



Community meeting (JESAC, 2024)

05. IMPACT

The project aims to recover land through tree replanting, enabling global climate contributions to support it via Paid Environmental Services (PES). This pilot allows direct cash transfers to individuals, companies, and institutions to increase the incomes of climate-affected populations by paying for measurable, monitored carbon sequestration over time. It offers an innovative solution for climate finance, supporting both people and the planet, and enhancing livelihoods in one of the world's most fragile ecosystems.



Tilling the land (JESAC, 2024)

06. REPORT

The pilot project, monitored through Smart Indicators, has achieved significant results despite challenges posed by the COVID-19 pandemic and political instability. On the agroforestry side, it has improved incomes for 1,725 people, enhanced water use, recovered soil, created complementary economic activities, enclosed 171 hectares, started five nurseries managed by 140 women, and planted 29,476 trees. For Paid Environmental Services (PES), results are tracked on the JESAC Platform, enabling climate contributions with high social co-benefits. Oxfam and its partners are seeking new funding to continue testing and establishing channels for climate contributions.



Youth action (JESAC, 2024)



Fig. 12. Jeunesse Sahélienne pour l'Action Climatique (JESAC, 2024).

07. NARRATE

A cutting-edge system facilitates direct emissions compensation on specific land plots where CO2 is captured. This includes a PES system for CO2 compensation, land restoration, and climate-resilient agriculture for young farmers. The project uses high-resolution satellite images to monitor tree growth and calculate CO2 capture, implements a blockchain-based traceability scheme to ensure CO2 is sold only once, and ensures maintainers are paid via mobile technology. Additionally, activities generating stable, additional income streams are analysed to improve harvests and promote climate change adaptation.

A triple bottom line solution for the economy, the society and the environment brings resilience to a future for the Sahel.



Contributors | A-2E, RJNCC/AYICC-NIGER, APEFE, African Unión, UE, AuxEU Youth Cooperation Hub, Lobelia, Caelum Labs, IGMVSS, Agence Nationale de la Grande Muralla Verte, JUDEV, FUGPN Mooriben & CO.VIVOOP.CA.

Roger Canals | Vins el Cep

Adapting to the new reality of the wine sector in the Mediterranean | Vins El Cep, Penedès

#organic #winery #farming

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Adapting to the new reality of the wine sector in the Mediterranean	Canals, R.	Vins El Cep	Penedès, Spain				

01. EMPHATISE WITH THE PROBLEM

There is a need to adapt to the changing conditions of the wine market: the various issues confronting vineyards, wineries, and their products must be acknowledged. The main risks and challenges include years of adverse droughts, grape yield, death of the vines, and use of chemical products that pose a risk to employees and harm the vineyards' environment.

Wineries face complex challenges, such as the potential negative impact of technological advancements on consumer health due to harmful wine preservation products and the high electricity consumption required for winery refrigeration equipment and machinery. In addition, excessive dependence on glass and plastic for packaging the final product contributes to pollution, and sustainable packaging options should be put in place in the wine industry. Effortful measures and solutions are being developed to create a sustainable future for the industry strongly associated with nature.

02. UNLEARN ABOUT ISSUES SOLVING

The company's vision focuses on building resilience and adaptability to the changing climate, environmental, and market conditions impacting the wine sector.

In ancient times, the viticulture sector used organic methods. However, in the 1970s, governments and large industries manufacturing phytosanitary products started to promote chemicals to grow "healthy" plants that would produce better yields.

It wasn't until the early 2000s that winegrowers started to detect the harmful effects these chemicals were having on people's health and the environment.

In 2010, Vins el Cep company, made a significant step forward by reintroducing and promoting organic viticulture in the Penedès area. Today, a remarkable 60% of all vineyards within DO Penedès (origen nomination) are organic, a testament to commitment and success in this area (DO Penedès, 2024). In 2025, all the vineyards in DO Penedès will be required to obtain organic certification. In the case of Vins del Cep, all vineyards have been certified as 100% organic since 2010. From 2003 to 2009, the company developed the first biodynamic Cava, "Claror".

Biodynamic implications are: (1) Organic farming practices, (2) biodiversity on ecosystems, (3) compost and soil health, (4) lunar and celestial influences, (5) biodynamic preparations, (6) rhythmic sowing and planting calendar.

Applying sustainable measures like solar panels, sulphite reduction and minimal intervention approaches in wine design to build resilience within uncertainty.

03. ANTICIPATE AND ANALYSE RISKS

Our proposal to convert to organic and biodynamic viticulture and sustainable winemaking has inherent risks which must be considered. One of the significant risks which could impact our proposal is the unpredictability of climatic conditions, especially the lack of rainfall.

It could lead to widespread challenges in maintaining vineyard productivity and health, directly affecting wine production. Removing chemical products from vineyards can render them fragile and vulnerable to diseases, reducing grape yields and posing difficulties in wine maintenance.

In addition, rising competition in organic and biodynamic viticulture compromises it, demanding constant innovation to stay ahead of the competitive edge. Also, low consumer knowledge about organic and biodynamic products and the lack of governmental regulations can negatively impact our efforts to market and distribute our resilient wines.

Strengths:

- Own vineyards.
- Own production.
- Sustainable mind and certification obtained.
- Already organic and biodynamic winegrowers.
- Big propriety with room for expansion.
- 44 years of experience as a winemakers.
- More than 500 years of history as a winegrower.

Weaknesses

- Small business with budget constraints for critical investments.
- Limited staff.
- Vulnerability of vineyards to diseases and pests.
- Lower production and higher cost.
- Increased risk of unexpected changes occurring in the wine during production.

Opportunities

- More knowledge and investment for sustainability from the governments and the big companies.
- Consumers in general appreciate more organic and sustainable products.
- More communication and education to fight climate change.
- New technologies can help pollute less during production.

Threats

- Unpredictability of the weather.
- Increasing competition in organic and biodynamic viticulture.
- Limited consumer knowledge about organic and biodynamic practices.
- Little government regulation for “natural products”.



04. PROPOSE AND OPERATE

Implementing resilient and sustainable measures to adapt to the changing realities of the business involves several factors:

There is a need to transition into organic and biodynamic viticulture practices. It entails the application of organic manures like compost, natural pesticides like pheromones, and organic fungicides like sulfur to have healthier vineyards without using harmful chemicals.

To fight the realities of water shortages, measures such as constructing cisterns or ponds, digging wells to access underground water, and introducing effective irrigation measures are necessary to sustain water resources.

Solving packaging-related pollution problems involves using lighter-weight bottles to keep down breakage and environmental impacts, as well as emphasizing recyclable caps and natural cork to keep plastic to a minimum.

To create a greener marketplace, informing consumers about the advantages of environmentally friendly habits, such as using light bottles and promoting recycled products, is critical.

05. IMPACT

The wine sector can make drastic leaps towards a more sustainable and resilient future by actively implementing the above solutions. These measures address immediate issues and lay the foundation for long-term manufacturing and prosperity in the sector, built on a circular system of producing and preserving the best quality of wine.





06 / 07. REPORT AND NARRATE

Incorporating a resilience logic that focuses on long-term impact and allows for comprehensive measurement of results from a holistic approach is essential. These new methods enable the identification of risks, feasible options, and desired future outcomes that align with international, national, and local agendas.

Implementing resilient-based sustainable measures within wineries is crucial: It includes reducing sulfites and chemicals in wine production, adopting a minimal intervention approach to wine-making from biodynamic viticulture, specific solutions for efficient water and energy management, and a careful reflection on packaging footprint, among other elements.

The narrative unveils the struggles in vineyards and wineries during the wine production process due to climate change and water scarcity. The stories unravel the effect of unpredictable weather patterns on grape harvests, showing the need for new solutions, switching to organic and biodynamic viticulture practices and ditching chemicals while improving energy and water systems' efficiency during the wine production time, and also in relationship to the glass bottles design. These records are compelling indicators of the need for traditional expertise, creativity, and adaptability in the face of evolving circumstances in the wine business.



Mònica Sans Duran | Awasuka Program

Combating indoor air pollution with smokeless kitchens | Awasuka Program, Nepal

#health #smokelessness #rurality

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Combating indoor air pollution with smokeless kitchens	Sans, M.	Awasuka	Rural Nepal				



01. EMPHATISE WITH THE PROBLEM

In Nepal, the number of reported deaths due to Indoor Air Pollution (IAP) exceeds those caused by earthquakes; 9.000 in 2015 vs 24.000 yearly (Smith et al, 2004). Moreover, 80% of the population of Nepal relies on firewood, and rural houses have no ventilation systems (WHO, 2009). IAP is called "The Silent Killer".

In rural areas of Nepal, since 2019, following the completion of post-earthquake reconstruction, field cooperators were able to witness first-hand the IAP effects in the earthquake-resistant houses built for our beneficiaries.

This project is targeting vulnerable families who rely only on firewood and have no access to other energy sources. Its objective is to improve children's and women's health by reducing IAP, to foster women empowerment by reducing cooking time and firewood collection time, and to reduce CO2 emissions and protect the environment. While this project may seem straightforward from a western point of view, local rural communities are not aware of the health risks associated with IAP. For generations, locals have been cooking with IAP without perceiving it as a hazard. The main challenge of this project is to change their mindset through local awareness raising sessions.

02. UNLEARN ABOUT ISSUES SOLVING

Vision of the problem: Due to lack of knowledge about improved kitchens, traditional smoky cooking methods are normalized. Moreover, rural societies distrust external inventions. However, once Awasuka's Chimney-Hood-Stoves (CHSs) are installed, they are rapidly accepted: an exceptional fact in these primitive, religious and superstitious societies. Other "improved kitchen" projects exist in the country, but they often suffer from installation flaws (most typical ones are short shaft and 90° angle bend) due to lack of technical knowledge in the field (monitoring and verifications). These failures have given a bad image to "improved kitchens projects" in the country. Recognising this problem, Awasuka has implemented improvements to address these common mistakes to ensure the success of their projects.

Vision of the issue: Smoky traditional cooking methods are built in homes due to complete ignorance towards better kitchens. Rural societies don't seem to believe in inventions coming from outside. But immediately after installation, Awasuka's Chimney-Hood-Stoves (CHSs) gain acceptance, which is phenomenal in these primitive and superstitious societies. Other improved kitchen projects in the country end up with faulty installation, such as short shafts with 90° bends; this is due to a lack of technical knowledge in the field. All these failures have tarnished the "improved kitchens" projects. Awasuka has made provision and modification to amend those dissemination failures and ensure that the project proves successful.

Stakeholder's ecosystems: Currently only small NGOs and Rotary Clubs are aware of this problem. Local Governments give their authorisation but they do not participate in the process.

Financials: Local staff (manager & CHS manufacturer) is covered by the project budget, but salaries of international team members are not included, due to sponsors' restrictions (small size project, strict justifications not allowing overhead costs over 10%).

Misconceptions and myths: There is a lack of technical knowledge about proper suction requirements for chimneys, along with the presence of many failed projects in the field which causes distrust among local communities.

03. ANTICIPATE AND ANALYSE RISKS

SWOT Analysis

Strengths: Chimney-Hood-Stoves (CHS) create benefits at many levels: Health, Environment and Gender Equality.

Weaknesses: Passive attitude of beneficiaries: used to receive subsidized projects from NGOs, including CHSs.

Opportunities: Beneficiaries can pay 100%, as they also own cell-phones – but awareness must be strong.

Threats: Flaws in the installations and lack of technical supervision can lead to operational deficiencies.

Risk Mapping

Poor selection of beneficiaries: Target group does not reach the most vulnerable groups who cannot afford a healthy chimney.

Installation flaws: They are possible if quality control procedures are not applied consistently and strictly.

Stakeholders

Government: No commitment to date, Rotary is working on it.

Local communities: Awareness raising is needed, especially since word-of-mouth communication is difficult in introverted society.

Manufacturers: Skills are learned fast, but third party technical supervision and quality control is needed.



Chimney before (Awasuka program, 2023)

04. PROPOSE AND OPERATE

The CHS (Chimney-Hood-Stove) project involves the design of a stove system by western partners, such as the German University and Siemens, which is then installed by locally trained manufacturers under the supervision of technical personnel.

The project utilises a combination of local materials (50% stones, water, mud) and imported materials (50% metal). The installation is carried out by local manufacturers and installers who have been trained by the program. A key aspect of the project is reviewing the location of the CHS on the plan and elevation of the house. The installers must have a background in metallurgy and knowledge of chimneys.

Additionally, a social mobiliser and technical personnel are needed for approval of the CHS layout location, supervision of the installation, and verification by a third party. The project requires skills in metal and masonry work. The design is done by European technicians, while the installation is carried out by local manufacturers and beneficiaries.

05. IMPACT

Key indicators: Indoor air quality was measured through sensors before and after the CHS (by B2S, LAB & UPC team). Health was monitored through surveys to beneficiaries and non-beneficiaries (by BIOCOMSCS & UPC team). Satisfaction surveys were conducted after installation.

Short, medium and long term effects: In the short and medium term, the surveys showed a reduction of smoke (most valued) and improvement of health. In the medium and long term, it also improved the relationship with the environment by using a 40% more efficient source that does not require as much tree felling.

Alignment with international, national or local agendas: At the international level the program follows the guidance of the Agenda 2030 SDGs. Regarding Indoor Air Pollution (IAP) reduction there are no national or local policies in this regard. There is interest from the Department of Health regarding the programme.

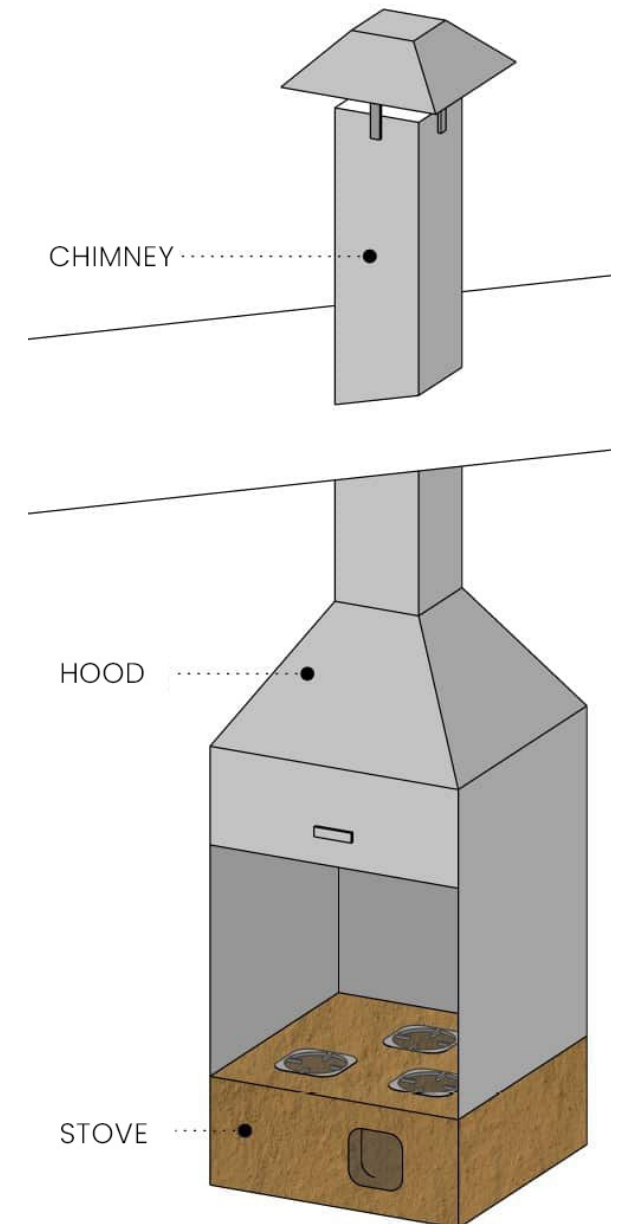


Fig. 13. Chimney Hood Stoves axonometry (AWASUKA Program, 2024)

A simple and efficient applied solution to improve the health of the local population for the minimum cost of 100 euros.



06. REPORT

Findings: Regarding production projects, there is a risk of improper implementation from the central office. Therefore, the operations should be handled by offices in rural areas. Regarding technical knowledge, ensuring the correct installation in the field is necessary, as well as considering that relying on local NGOs, local installers, and beneficiaries is not enough. More awareness is needed, especially at the local level, to understand IAP problems.

Lessons learned & recomms : Implementing rural projects solely from the capital is not feasible, as occasional visits are inadequate. To ensure effective and efficient installation, living in and understanding the rural environment for at least 6 months during project implementation is crucial. Analysing and comprehending the rural setting necessitates an emphatic understanding of all societal layers.

07. NARRATE

Storytelling: The project utilises videos targeted at sponsors and local communities, showcasing various examples on our website. Word-of-mouth is particularly effective in local areas, as beneficiaries share their experiences through storytelling. Additionally, health workers are encouraged to act as storytellers, educating patients about the benefits of Chimney Hood Stoves (CHS).

Way Forward: Awareness-raising campaigns at a national level should be addressed to locals, not to government officials and people living in the city. Training more local managers, manufacturers & installers, auditors, and verifiers is necessary. Community engagement in rural projects with

participation from young citizens (Rotaractor) - through telephone verifications and visits - worked very well. As a result, Rotaractor's mindset changed, making them more aware of Nepalese rural society and expanding our search for more prominent funders to scale up our operations and reach more communities.



Sara Ferrara & Prof. Dr. Rubén Costa | Technical University of Munich

Bio-hybrid light emitting diodes (BIO-HLEDs), fluorescent proteins as an ecofriendly alternative to traditional lighting | TUM, Germany

#innovation #ecofriendly #bioled

CASE STUDY	AUTHOR	ACTOR	LOCATION	APPROACH	SCALE	SCOPE	INTERNACIONAL AGENDA
Introducing Bio-Hybrid Light Emitting Diodes (BIO-HLEDs): fluorescent proteins as an eco-friendly alternative to traditional lighting sources	Ferrara, S. Prof. Dr. Costa, R.D.	Technical University of Munich	Global				

01. EMPHATISE WITH THE PROBLEM

What kind of lamps do you have in your living room?

You probably have incandescent or LED lamps. The lamps in our rooms contain rare earth inorganic compounds and a blue-emitting chip, both critical components defining the problem in this case study.

On the one hand, nowadays, the world suffers from a severe scarcity of inorganic resources, particularly phosphorus, essential for producing light sources that do not contain carbon. For example, only 400 ktons of Yttrium are left in the world. It has raised concerns about the ecological cost of using these materials (Lin et al, 2016). On the other hand, there is also a health concern associated with the emission of white or blue light. Studies have shown that prolonged exposure to these types of light can pose a risk to the human retina (Sparrow et al, 2000), (Narimatsu, 2015), (Chen, 2019), etc. By recognising the relevance of these factors, we appreciate the complex interplay of material scarcity, environmental impact, and potential health concerns of current lighting technologies.

02. UNLEARN ABOUT ISSUES SOLVING

Can you imagine fluorescent proteins being your light source?

Traditional methods of producing LEDs not only utilize harmful compounds but also draw on limited resources. The use of fluorescent proteins offers an environmentally friendly and green alternative for illumination purposes.

The future of lighting design is envisioned as a paradigm shift from conventional inorganic LED technologies towards the innovative use of fluorescent proteins sourced from marine organisms like *Isosoma*, Japanese Anemone, *Aequorea Victoria* and Green Anemone. By embracing bio-hybrid approaches, we aim to create light sources that are eco-friendly, economically viable and offer diverse emission properties.

03. ANTICIPATE AND ANALYSE RISKS

Are fluorescent proteins and LEDs really compatible?

The primary risk is acquiring stability in Natural Green Fluorescent Proteins for LEDs, crucial to their long-term viability in lighting. This stability is a need to support a successful market entry. The second risk is potentially not meeting efficiency requirements despite acquiring stability. This could inhibit market entry and decelerate the rapid progress of the target Bio-Hybrid Light Emitting Diodes (BIO-HLEDs).

In addition, the use of proteins as a light source can raise human health and environmental issues, and more research is needed.

04. PROPOSE AND OPERATE

The solution proposes the application of Bio-Hybrid Light-Emitting Diodes (BIO-HLEDs) as a novel means to overcome the drawbacks of traditional LED light systems. The essence of this proposal is the utilisation of fluorescent proteins as a natural light source.

These proteins serve as a paradigm of natural light, providing a sustainable and eco-friendly alternative to traditional phosphors and inorganic materials used in LEDs. The solution components entail leveraging water processability, enabling relatively cheap production to enhance cost-effectiveness and contribute to mitigating air and water pollution. Using fluorescent proteins in BIO-HLEDs aims to address the limitations related to ecological costs and the hazardous impact of blue light on human health associated with traditional LED technologies.



BIO-HLEDs combine biological and technological components to create innovative, sustainable and resilient lighting solutions.



The Spermatozoa Collection (Ferrara, 2024)

05/06. ACHIEVE IMPACT AND REPORT ON IT

Are the potential end-users ready when the technology is ready?

With the incorporation of natural light sources and innovative production strategies, this solution will revolutionise the lighting industry and promote resilience-based sustainability in lighting use. The impact of the outputs and outcomes in the context of Bio-Hybrid Light-Emitting Diodes (BIO-HLEDs) is excellent in transitioning to green LED lighting and consistent with the 2030 Agenda.

This innovation is directed towards the integration of BIO-HLEDs in various applications, with a particular focus on vertical farming and indoor lighting. Short-term goals include assessing the product potential for vertical farming and other applications by 2024. Long-term goals aim to reach high efficiency (200 lm/w) and durability (10,000 hours) in indoor light applications.

These achievements not only contribute to environmental sustainability but also represent technological advancements in the LED industry, reflecting a commitment to eco-friendly and healthier solutions.

The use of fluorescent proteins in BIO-HLEDs aims to address the limitations and ecological costs associated with traditional LED technologies.



Fluorescent dyes (Tiankun Chemical, 2021)

07. NARRATE

Is there a perception of the urgency of the problem from companies and customers?

It is imperative to develop technology and render it sustainable, flexible, and functional in various contexts. Integrating aspects like adaptability and resilience in design processes enables product responsiveness to evolving needs and contributes to a better future.

It is also relevant to consider the broader impact that emerging technologies can have over and above their initial intended purpose. It reflects the responsibility of researchers and creators to address challenges with sensitivity and disruption, leading to holistic and systemic analysis to achieve positive cascade impacts.



Bioled (Ferrara, 2024)

Way For- ward

Sébastien Thomas | Climate Justice and Resilience Unit Coordinator at OXFAM Intermón

Takeaways

OUR VISION: What direction should we take? How should we guide our design choices?

1. Design for social change (in line with the 2030 Agenda & SDGs): A design for social, climate, gender, and economic justice. Concepts such as sustainability, consciousness, ethics, fairness, and collaboration must be in the DNA of any future design effort. Incorporating a resilience framework that focuses on risks and sustainable dimensions from a holistic and systemic approach is essential.

2. Design for regeneration and redistribution: Design processes and products should be as generous as nature, caring both for people and the planet. If a design is not regenerative, it is not resilient; while it may generate economic benefits, it does not create true prosperity (Georgescu-Roegen, 1971) & (Latouche, 2022).

3. Design for desirable future scenarios: Design must craft narratives and visions of positive futures that are closely connected to both the environment and humanity's inner essence, avoiding the extremes of dystopia or utopia. Creating resilient future scenarios fosters dialogue between actors with often contradictory approaches and perspectives, ultimately paving the way for consensus-building. Our storytelling and marketing efforts should emphasise the importance of impact, replicability, and scalability.

RESILIENCE PATHWAYS: How can we improve our design practices?

4. Be patient and actively listen to understand genuine needs and emotions: The resilient process may be more protracted and uncertain due to the incorporation of unusual suspects and the need for inclusion. Planning for engagement, communication and participation, while embracing iteration, adaptation and evolution ensures continuous improvement.

5. Co-design (with individuals and communities) and build agency: The resilient process should be collaborative, interdisciplinary, practice-based, and knowledge-based. Finding a balance between top-down temporary solutions and bottom-up durable approaches, and enables building bridges and alliances with different actors and disciplines.

6. Combine in a “jam session” and continually improvise style: The resilient process needs both short and long-term strategies to achieve a radical shift through incremental/progressive/evolutive design, transforming the system at different levels and embracing complexity.

DESIGNERS FOR RESILIENCE: What skills should they have? Do they have a shared identity?

7. Designers with robust and flexible knowledge: Resilient-thinking designers have the ability to think globally and act locally, combine traditional expertise with disruptive and innovative technologies, and create from a solid technical background using adaptive and evolving tools.

8. Designers acknowledging risks, shocks, stresses and uncertainty: Resilient-thinking designers propose strategies and tactics and build resilient capacities continuously. They are empathetic committed, socially engaged, open-minded, flexible, ready to try, to unlearn and learn from mistakes.

9. Designers with many hats: Resilient-thinking designers are curious about the environment and the changing reality that surrounds us, humbled to see themselves as part of a large-scale systemic process, and empathetic to embrace a pioneering approach that incorporates different needs and sensitivities.

Human activity has become a predominant force shaping our climate and environment, but humans should not be the centre of design. We share our ecosystem with many other species and these natural nonhuman stakeholders should be included in design processes that promote positive transformation, reverse climate change, and prevent social and ecological breakdown.

Braulio Eduardo Morera | Head of Resilience Solutions at World Economic Forum

Afterword: Resilience for the Everyday

Resilience is often discussed in the context of emergencies and disasters. However, it is a much more comprehensive concept. Resilience encompasses a broader range of capacities to adapt, respond, and thrive amidst long-term stresses and acute shocks. It involves ensuring essential functions—such as access to safe housing and drinking water—and protecting human lives and assets during disruptions or crises. In this sense, proactively building resilience plays a key role in preparing for such eventualities. Resilience is, therefore, a daily practice that can—and should—be woven into the fabric of our lives to prepare us for difficult times.

The traditional association of resilience exclusively with emergencies, such as natural disasters or major disruptions, is often limiting. While resilience is critical during crises, this view can narrow our perspective. Resilience is not created suddenly from scratch only when needed; it must be cultivated through daily decisions, the environments we shape, and the systems we design—whether big or small. The key is to shift from viewing resilience as a narrative response in extreme situations to understanding how it relates to the everyday practices and objects we interact with.

To apply the concept practically, resilience can be understood through two key questions: “Resilience of what?” and “Resilience to what?” This simple framework helps define the specific areas we want to make resilient and the types of shocks or stresses we anticipate—importantly, it also allows us to explore the unexpected. Whether considering how we design garments that adapt to diverse users or choose solutions for city infrastructure, these framing questions can guide us toward practical, real-world applications of resilience. This approach allows us to zoom in on the resilience of the most personal aspects of our lives and the lives of others, including the objects we use daily, the physical spaces in which we live, work, and play, and the infrastructure we rely on.

The work done in the seminar in ELISAVA School, explored in the previous pages, offers an insightful contribution to design thinking and resilience by integrating these into an exploratory method.

The projects presented demonstrate how combining design and resilience thinking can help us reimagine how we prepare for crises and live with finite resources in an increasingly unpredictable environment. Applied to resilience, design thinking encourages us to consider the human experience at its most granular level. Designers are often trained to situate themselves in the lived realities of others, understanding their needs and challenges. In doing so, they help shape environments and systems that, if designed for resilience, not only withstand the unpredictable but also enable us and our communities to thrive regardless.

A key insight from ELISAVA’s resilience seminar is recognising that resilience exists on both small and large scales, ranging from personal items like clothing to shared urban assets such as workspaces and infrastructure, as well as the processes used to plan and design them. How we think about the materials and spaces in our homes and workplaces directly impacts our ability to cope with and thrive amidst disruptions, especially in a changing climate. Designing for resilience, therefore, requires technical knowledge, anticipation, and empathy—a deep understanding of the environment, human experiences, and the stresses people face in everyday life and readiness for the unknown.

Placing ourselves in others’ experiences is an act of generosity, one that can ultimately enhance our collective resilience.

Operationalising resilience in the built environment is a complex challenge, but design thinking can help turn it into a practice for everyday life.

Bibliography

Chen, P., Lai Z., Wu L. (2019). *Retinal Neuron Is More Sensitive to Blue Light-Induced Damage than Glia Cell Due to DNA Double-Strand Breaks*. Cells, 8, 68. doi.org/10.3390/cells8010068

Design Council (2020). *Design perspectives: design skills*. www.designcouncil.org.uk/fileadmin/uploads/dc/Documents/Design%2520Perspectives-%2520Design%2520Skills.pdf

DO Penedès (2024, July 28th). *More than 60% of wines from the DO Penedès are organic*. <https://dopenedes.cat/dopenedes/>

GEF (2023). Brazil and the GEF – A Transformative Partnership. https://www.thegef.org/sites/default/files/2023-06/GEF_Brazil_2023_06_v3.pdf

Georgescu-Roegen, N. (1971). *The Entropy Law and the Economic Process*. Harvard University Press https://content.csbs.utah.edu/~lozada/Adv_Resource/Econ/En_Law_Econ_Proc_Cropped_Optimized_Clearscan.pdf

GBD 2016 Lifetime Risk of Stroke Collaborators (2018). Global, Regional, and Country-Specific Lifetime Risks of Stroke, 1990 and 2016. *The New-England Medical Review and Journal*, 379(25). doi.org/10.1056/NEJMoa1804492.

Latouche, S. (2022). *La décroissance*. Que sais-je ?. Presses Universitaires de France.

Lin Y.C., Karlsson, M., Bettinelli, M. (2016). Inorganic Phosphor Materials for Lighting. *Topics in Current Chemistry*, 374, 21. doi.org/10.1007/s41061-016-0023-5

Narimatsu, T., Negishi K., Miyake S. (2015). Blue light-induced inflammatory marker expression in the retinal pigment epithelium-choroid of mice and the protective effect of a yellow intraocular lens material in vivo. *Experimental Eye Research*. 132. 48-51. doi.org/10.1016/j.exer.2015.01.003

N’UNDO (2011). Manifest n’UNDO. Think tank on territory and city from the point of view of not doing, doing, undoing and redoing. <https://nundo.org/ntheoria/>

N’UNDO (2025). *Not do, redo and undo to built cities*. ISBN 978-84-0969-790-8. <https://nundo.org/ntheoria/>

OXFAM (2022). *Climate Finance in West Africa Assessing the state of climate finance in one of the world’s regions worst hit by the climate crisis*. <https://oxfamlibrary.openrepository.com/bitstream/handle/10546/621420/bp-west-africa-climate-finance-270922-en>.

PAHO (2023). *The influence of environments situation and challenges on healthy aging*. World Health Organization Global Network for age-friendly cities and communities. Pan American Health Organization & World Health Organization. <https://iris.paho.org/>

RAE (2024). *Resilio meaning*. <https://dle.rae.es/resiliencia>

Raworth, K. (2017). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. Random House. ISBN: 9781847941398

Robbins, J. G., & Wiechelt, S. A. (2004). *Environmental Concern and Personal Health Behaviors in Women*. *Journal of Human Behavior in the Social Environment*, 7(3–4), 141–158. doi.org/10.1300/J137v07n03_09

Smith, K. R., Mehta, S., & Maeusezahl-Feuz, M. (2004). *Indoor air pollution from household use of solid fuels*. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors, 2, 1435–1493. <https://www.who.int/publications/i/item/9241580313>

Steffek, V. & Shahani, M. (2020). *Refashioning Adaptive Clothing for Persons Living with Hemiparesis*. Conference IFFTI 2020. Kent State University. <https://oaks.kent.edu/iffiti2020/iffiti-2020-between-individual-and-society-community/refashioning-adaptive-clothing>

Sparrow, J. R., Nakanishi K., Parish C. A. (2000). *The lipofuscin fluorophore A2E mediates blue light-induced damage to retinal pigmented epithelial cells*. Invest Ophthalmol Vis Sci, 41, 1981–1989. <https://pubmed.ncbi.nlm.nih.gov/10845625/>

Urban Innovative Actions (2024). Baia Mare – SPIRE –Smart POrt-Industrial Regenerative Ecosystem. <https://uia-initiative.eu/en/uia-cities/baia-mare>

UN Habitat (2024). *Yakutsk City Snapshot*, Contextual information of the city and current actions for building resilience. Urban Resilience Hub. <https://urbanresiliencehub.org/city-context/yakutsk/>

UNDRR (2015). *Sendai framework for disaster risk reduction 2015–2030*. United Nations Office for Disaster Risk Reduction. <https://www.undrr.org/media/16176/download?startDownload=20240726>

Vision Foundation (2023, October 12th). *White Canes: Myth-Busting and Learning*. Vision Foundation. <https://www.visionfoundation.org.uk/news-category/white-canes-myth-busting-and-learning/>

World Economic Forum (2016). *Shaping the Future of Construction. A Landscape in Transformation: An Introduction*. https://www3.weforum.org/docs/WEF_Shaping_the_Future_of_Construction.pdf

Acknowledgments

Seminar direction:

Amaia Celaya Álvarez

Coordination & edition:

Sébastien Thomas
Arianne Alzola Domínguez

Brand, graphic & creative direction:

Carlos Mansilla (CARMAN Atelier)

Publication Contributions:

Joaquín Acevedo
Santiago Albert
Ana María Álvarez
Enric Bayó
Roger Canals
Rubén Costa
Joaquín Cuevas
Sara Ferrara
Ares Gabàs Masip
Marta Leboreiro Núñez
Txell Manresa
Braulio Eduardo Morera
Nikolay Nikolaev
Mònica Sans Duran
Claudia Soto

Seminar contribution:

Miquel Corral
Helene Fourniere
Johanna Granados
Nuria Widmann
N’UNDO

Peer review:

Yana Antonenko
Miquel Corral

Version:

V01 - Released May, 2025

Recommended citation:

Celaya et al. (2025). Resilience in Design. Forward-thinking approaches to equity, prosperity and ecological responsibility.

ISBN: 978-84-09-70973-1

Creative production consultant

I am Nuria | iamnuria.com

This book was printed on paper certified by:
FSC® FSC-C110625

In collaboration with:



RESILIENCE IN DESIGN
by Amaia Celaya Álvarez



ISBN 9788409709731