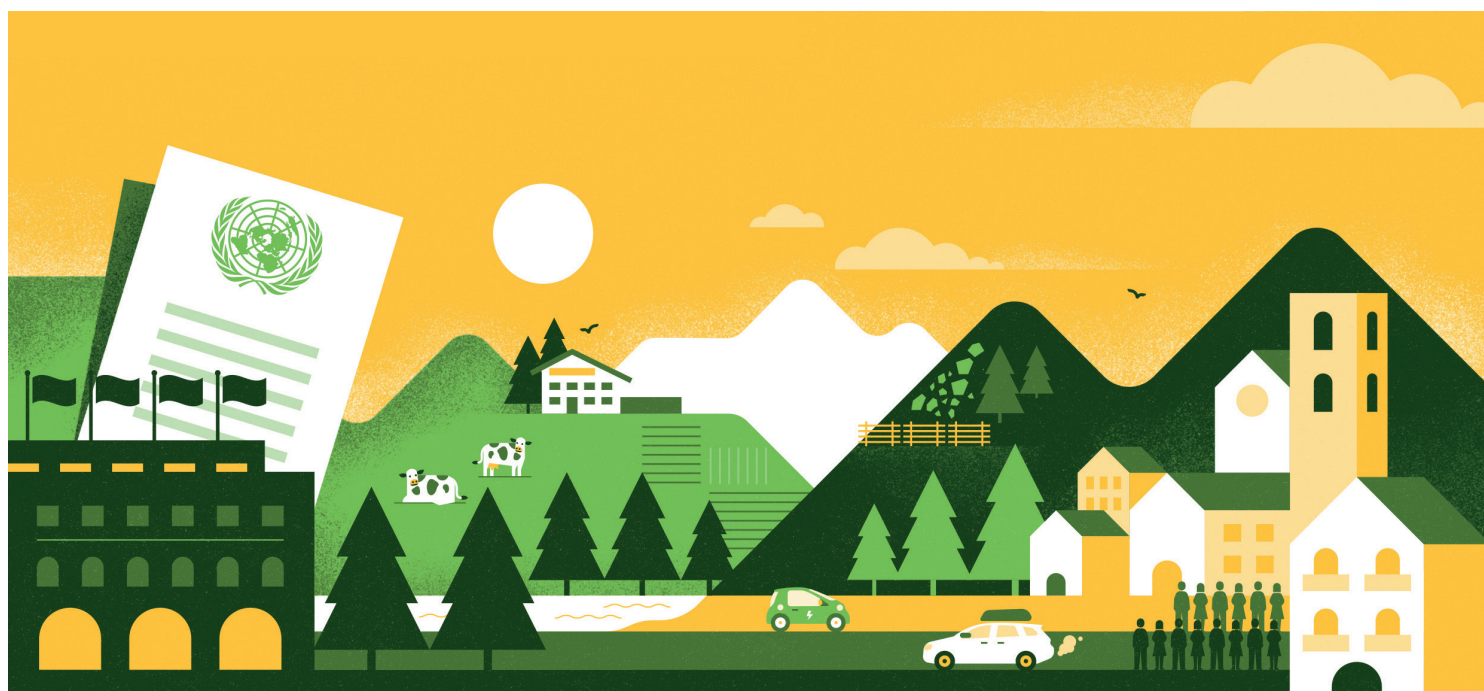


CONFERENCE REPORT

Global Mountain Sustainability Forum 2020

Sustainability Governance: International Frameworks and Local Contributions

5-6 OCTOBER, 2020



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1. Background and objectives

1.1 The Global Mountain Sustainability Forum series

In the epoch of the Anthropocene, where humans have a significant impact on the Earth's climate and ecology, the sustainability of social-economic systems is a basic prerequisite for the long-term existence of humankind. Any pathway towards such sustainability necessarily calls for deep transformations of societies and will require complementary actions by governments, civil society, science, and business (Sachs et al., 2019). By and large, it remains unclear if and how respective processes of societal and institutional upheavals may be initiated and will take place. Nevertheless, sustainability has turned into a matter of individual lifestyle and individual daily choices rooted in common values in parts of society.

Acknowledging the necessity of fundamental changes, the United Nations and its member states have been developing a framework for national action and global cooperation: the 2030 Agenda for Sustainable Development and the respective 17 Sustainable Development Goals. With only 10 more years left to achieve these goals, the United Nations' Secretary-General has raised a universal call to mobilize for a decade of global, local and people action. At the core of this call is the need to tackle growing poverty, empower women and girls, and address the climate emergency.

Within this context, the newly established [Global Mountain Sustainability Forum \(GMS Forum\)](#) conference series will discuss challenges concerning sustainability in mountain regions, which also provide invaluable ecosystem services for lowlands and their populations; these are often not appropriately taken into account in policies and decision-making processes.

1.2 The Global Mountain Sustainability Forum 2020: Sustainability governance – international frameworks and local contributions

The very first edition of this newly established conference series took place on 5-6 October and was jointly organised by two centers of Eurac Research, South Tyrol (Italy). The [Center for Advanced Studies](#) is dedicated to future-relevant issues and the observation, description and analysis of economic and societal processes of change. The [Center for Global Mountain Safeguard Research \(GLOMOS\)](#) is a collaborative programme and mountain research alliance between Eurac Research and the [Institute for Environment and Human Security of the United Nations University](#) based in Bonn, Germany.

The GMS Forum gathered academics and other stakeholders from all over the world on a virtual platform. Keynote speakers and presenters tackled sustainability governance issues at the junction between international frameworks and local contributions, focusing on the topics of tourism and natural resource management of mountain regions.

The two-day conference programme was structured in four main Thematic Sessions opened by a Keynote and followed by online presentations.

The four thematic sessions of the GMS Forum 2020 edition were:

1. Global developments and critical issues in sustainability in mountain regions
 - Overtourism
 - Climate change
 - Demographic change
 - Energy transition
2. Natural resources and sustainability in mountains
 - Integrated catchment management
 - Climate resilience
 - Supply and demand issues between highlands and lowlands
3. Tourism and sustainability in mountains
 - Monitoring tourism activities
 - Assessing developments in tourism against sustainability objectives
 - Societal transformation processes related to tourism
 - Cultural sustainability
4. Sustainable governance in mountain regions – potential and limitations of possible solutions
 - Successful management of natural resources within the context of competing users
 - Disaster risk reduction within the context of changing climate conditions and increasing touristic activities
 - Sustainable management of natural resources – protected areas (UNESCO World Heritage Sites (WHS), Geoparks, UNESCO Biosphere Reserves, UNESCO Global Geopark Network (GGN))
 - Local community space versus destination space? The role of participation: instruments and methods for local empowerment

1.3 Format

Each thematic session was opened by an invited Keynote Speaker.

For each one of these thematic sessions, researchers from the global mountain research community were invited to submit their application to present their work. The applications were reviewed by the scientific committee, through a blind peer-review process, accepting a total of 29 presentations.

In addition, particular attention was dedicated to two contemporary issues for mountain regions locally and worldwide: the challenges for sustainability governance in the context of Olympic games and big sport events, as well as the recent COVID-19 crisis and its implications. These two topics were addressed in two workshops, in which participants were invited to reflect and discuss about them.

The first day of the conference concluded with a public evening event. The event opened with a speech by Reinhold Messner, a world-renowned South Tyrolean mountaineer, whereas the second part saw four local experts debate contemporary challenges for mountain sustainable development, focusing in particular on protected areas.

The second day concluded the Forum with a speech by Prof. Joseph Stiglitz, Nobel Laureate in Economics, Public Policy Analyst and Professor at Columbia University, on the possibilities of a greener global economy after the COVID-19 pandemic.

1.4 Participation and attendance

The first edition of the GMS Forum, initially scheduled as an in-person event hosted by the municipality of Sesto/Sexten, was transformed into an online event due to the COVID-19 crisis. Despite these last-minute changes in the conference modalities, the number of participants was high, including 96 attendees who registered for keynotes and presentations on both days, and 156 attendees who registered for the public event. Participants were representing a total of 48 different institutes, located not only in Europe, but also in the Americas, Africa and Asia.

2. Opening remarks

Chair: Harald Pechlaner

The first edition of the GMS Forum was opened with welcome speeches by the representatives of the Scientific Organizing Committee.

Prof. Dr. Harald Pechlaner, head of the Center for Advanced Studies at Eurac Research, welcomed all participants by officially introducing Eurac Research. At Eurac Research interdisciplinarity is a keyword and a guiding principle, leading efforts towards sustainable development by combining social and humanistic sciences with technical and natural sciences. Eurac Research's applied science contributes to the development of good regions to live, fostering the richness of diversity as well as the uniqueness of each individual through the promotion of social cohesion and the integration of minorities, thereby ultimately contributing to a healthy society.

The same values are shared by the United Nations University Institute for Environment and Human Security (UNU-EHS), and were presented by Dr. Stefan Schneiderbauer, head of the Global Mountain Safeguard Research Programme (GLOMOS) Office in Bolzano. GLOMOS is a joint research programme of Eurac Research and UNU-EHS (based in Bonn, Germany), with the leading motto "turning science into action". This joint research programme marked the establishment of the first United Nations duty station in Bolzano, and the very first United Nations University duty station in Italy. This collaboration sends a clear message of the importance of joining forces towards sustainable development of mountain regions. 2020 marked the start of the "last decade for actions", referring to efforts for the implementation of the Sustainable Development Agenda 2030, and the achievement of the Sustainable Development Goals (SDGs). Sustainable governance of mountain regions is fundamental for successful results in this regard.

Dr. Schneiderbauer's message was followed and reinforced by the strong words of Dr. Xiaomeng Shen. Dr. Shen is the Director of the Institute for Environment and Human Security of the United Nations University, in addition of being the Vice-Rector of UNU in Europe. In her presentation, Dr. Shen introduced the role of mountain regions, critical to the livelihoods of both highland and lowland communities. Considered the "water towers" of the world, mountains are great providers of freshwater along with many other resources. Healthy forests also play an essential role in reducing impacts of natural hazards, and therefore enabling the safety of communities. Mountains are, however, also particularly sensitive to climate change, which is likely to have consequences on the intensity and frequency of natural hazards. Dr. Shen concluded her speech by highlighting the need to find solutions to these challenges in order to protect the wealth of the biological and cultural diversity of these systems.

The introductory session was concluded by Waltraud Watschinger, President of the Tourist Office Sesto/Sexten, and Christoph Rainer, President of the association Sextenkultur. The GMS Forum was born from a collaboration with Sesto/Sexten, a municipality in Alta Pusteria Valley (Italy). Sesto/Sexten proved to be an excellent cooperation partner, highly committed to the issues addressed in the conference. This is reflected in the many local sustainable development initiatives launched by Christoph Rainer and Sextenkultur. For 30 years, Sextenkultur has been contributing to the discussion on tourism in mountain

regions, establishing, among other things, the “Sextner Kamingespräche”, an event series in which current tourism-related topics are addressed and discussed at a scientific level. Since then, Sesto/Sexten has evolved to become a hub for sustainable tourism. The cooperation with Sesto/Sexten was also valuable in bridging the global and the local scales, offering the possibility to link major global issues to a very concrete local context, which is a central goal of the GMS Forum. While this year’s edition of the conference had to be entirely moved to the digital space due to the COVID-19 pandemic, it will hopefully be possible to hold the next edition of the conference onsite in Sesto/Sexten.

3. Keynote presentations

The group of distinguished keynote speakers was formed by Prof. Julia Klein (Professor at the Department of Ecosystem Science & Sustainability and Research Scientist at the Natural Resource Ecology Laboratory, Colorado State University), Prof. Dr. Jakob Rhyner (Professor for Global Change and Systemic Risks at the Agricultural Faculty, University of Bonn), Dr. Dirk Glaesser (Director at the Sustainable Development of Tourism Programme (STD), World Tourism Organisation), Dr. Musonda Mumba (Chief of the Terrestrial Ecosystems Unit, UN Environment) and Prof. Joseph Stiglitz (Nobel Laureate in Economics, Public Policy Analyst and Professor at Columbia University).

3.1 Julia Klein: Threats to mountains worldwide and how science with society can help transform mountain futures

Chair: Harald Pechlaner

Prof. Julia Klein is a professor at the Department of Ecosystem Science & Sustainability and a Research Scientist at the Natural Resource Ecology Laboratory at Colorado State University, as well as leader of the Mountain Sentinels Network. Prof. Klein opened Thematic Session 1 with her Keynote, introducing threats to mountains worldwide and showcasing how science can contribute to a more sustainable future for mountains. With her presentation, Prof. Klein prepared the ground for discussions on challenges and opportunities for sustainable management of mountain regions, inviting to better connect communities and stakeholders in the policy-making process.

Considering the current mountain challenges as an opportunity, Prof. Klein's presentation invited reflection on the future of mountains, on the creation of a vision for sustaining mountains and work towards transformations.

Challenge conventional narratives and roles

Acknowledging the critical role that local knowledge plays in identifying solutions that cannot be found in "Western science" alone, Prof. Klein called for the need to promote participatory approaches involving both local population and non-scientific stakeholders in the policy and decision-making process, with a special regard towards transdisciplinary collaboration with international networks. "Western science" is often regarded as the only reliable source of knowledge that can provide solutions for a sustainable future. Local knowledge and local narratives are however equally important, Prof. Klein argued, in providing critical information on social-ecological dynamics shaping mountain regions.

It takes a village to make changes happen, so build bridges

Mountain Sentinels is a network founded in 2012 and composed of people working on mountains with a focus on mountains seen as social-ecological systems. Joint research led by the network led to the identifying of a great paradox, namely that policies affecting mountains are often made by people who do not live in mountains. It is critical that biophysical and social scientists engage in collaborative research with diverse local stakeholders (sentinel voices). Projects initiated only by researchers do not have a high policy

impact. For research projects to have a high impact on policies, it is critical that a collaborative process is initiated with communities and local stakeholders being involved from the beginning.

Take risks

Prof. Klein concluded her keynote with an invitation to approach current challenges as opportunities for the future of mountains, by taking some risks. In times in which everyone is easily exposed to misinformation and people still question the science of climate change, it is critical to think differently and work to change the narrative of mountain futures by evoking images everybody can relate to.

3.2 Jakob Rhyner: Dealing with risks in the mountains – Yesterday. Today. Tomorrow?

Chair: Stefan Schneiderbauer

Prof. Jakob Rhyner, Professor of Global Change and Systemic Risks at the Agricultural Faculty, University of Bonn, opened the Thematic Session 2, inviting participants to a journey through time concerning risk management in mountains, with a particular focus on the Alps as case study. His keynote introduced the tremendous changes that have happened over time, defining approaches to managing risk, from a very religious perspective to predominantly scientific approaches. The approach on disaster risk reduction in mountains has seen religious connotations initiated by monks who wanted to show evidence of the correlation between natural hazard events and sinful behaviour. From those examples of first data collection, several measures for dealing with disaster risk have developed, including the construction of structures against hazards first introduced in the 19th century (including examples of dry-stone walls against avalanches which nowadays present a rockfall risk). This process led to the predominant focus on engineering solutions in the 20th century, based on systematic hazard and risk research, modern avalanche defence measures, and hazard maps supported by avalanche flow modelling.

Integrated Risk Management (IRM)

The progress and advancing in disaster risk reduction is strongly related to the occurrence of natural hazards. The absence of extreme events means that communities are not impacted, but it does not have to be interpreted as a reduction of disaster risk. Natural hazard events, while often traumatic for human societies and ecological systems, can provide important learning opportunities that can be applied in the mitigation of future losses and damages. A limited experience of hazards lowers the level of perception of people and does not motivate the identification of effective measures to prevent adverse impacts of these events. It is for this reason, that identifying risk leads to a much more complex conceptualization, leading to Integrated Risk Management (IRM). Operating on different phases of the risk cycle (prevention, intervention, and recovery), IRM looks into risk as an equation including probability of scenario, exposure, damage potential, vulnerability, and risk aversion. Prof. Rhyner particularly focused to the concept of “risk aversion,” referring to the willingness of communities to invest in risk mitigation measures. This element sheds lights on a critical aspect, which is the need for an agreement within a society on accepted costs and desired results when investing in disaster risk reduction measures. Aiming at zero risks requires increasing

efforts, both at a societal and at an economic level, and marginal risks are to be acknowledged in reflection of the capacities and needs of the exposed communities

The decision-making process for disaster risk reduction and climate change adaptation in mountain areas is further influenced by the lowlands, explains Prof. Rhyner. Changes in climate (e.g., melting water, rising snow lines, changing hazards and unsteady water supplies) face economic pressures, including adapting to tourism and the energy market. In relation to tourism, there is an ever-growing need for innovative adaptive solutions.

3.3 Dirk Glaesser: Insights into the worldwide debate on sustainable tourism – learnings for mountain regions

Chair: Harald Pechlaner

Dirk Glaesser is director of the Sustainable Development of Tourism Programme (STD) of the World Tourism Organisation (UNWTO). In his keynote, Glaesser focused on the interconnections between tourism and sustainability and proposed different visions of a responsible restart of tourism after the COVID-19 pandemic.

Before the pandemic: Monitoring and reporting of sustainability in the tourism sector

According to Glaesser, the Sustainable Development Goals (SDGs) have created a framework of ambition at different levels, among others at the levels of nations, destinations and the private sector. Goals related to tourism were included mostly in SDG 8 (“Decent work and economic growth”) and SDG 12 (“Sustainable consumption and production”). While this new framework has been able to strengthen the importance of sustainability in tourism policies (see <https://www.unwto.org/publication/Baseline%20Report%20on%20SCP>), there remain major issues when it comes to the monitoring of the achievement of the objectives. First, data coverage for most of the goals is rather low (for most of them below 60%). More evidence would be needed to provide reliable information about the progress and the necessity of future policies. Second, most of the available data is outdated (from 2018 or earlier). This makes it difficult for policy areas to provide corrections based on up-to-date data. What is needed is hence an improvement of the way in which the SDGs and sustainability indicators in general are measured. This includes the need for context-relevant, timely evidence and the public availability of data.

During the pandemic: Travel restrictions and the readiness of public health systems

The COVID-19 pandemic resulted in a standstill never imagined before. In some form or another, all global destinations had travel restrictions in place. Following Glaesser, the health and hygiene infrastructure as well as the quality of the public health services provided was crucial in determining the ability of destinations to react to the pandemic. The better prepared countries were for unforeseen events, the higher their ability to deal with the crisis was. Based on data compiled by the UNWTO in September 2020, Glaesser put forward the hypothesis that there is a correlation between the attitude of tourism towards

sustainability and the way in which countries have been performing during the crisis. Those countries that have taken sustainability more seriously in their tourism strategy in the past are also likely to be better off in the pandemic.

After the pandemic: Towards a responsible restart of tourism

Following Glaesser, the tourism sector is eager to take responsibility and evolve in order to contribute to a sustainable transformation of society that stays within planetary boundaries. In this endeavour, the following issue areas are of particular importance: public health (e.g., integrate epidemiological indicators in tourism and restore trust through communication), social inclusion (e.g., repurpose tourism as a supporter of the community and channel support towards vulnerable groups), biodiversity conservation (e.g., support conservation efforts through tourism and invest in nature-based solutions for sustainable tourism), climate action (e.g., monitor and report CO₂ emissions and accelerate the decarbonization of tourism operations), circular economy (e.g., invest in transforming tourism value chains and prioritize sustainable food approaches for circularity), governance and finance (e.g., measure beyond economic impacts and steer recovery funds towards more sustainable tourism). While many of the challenges are the same at the international level, Glaesser stressed that the solutions always depend on the local context.

3.4 Musonda Mumba: Sustainable challenges of tourism in mountains of the global south

Chair: Stefan Schneiderbauer

Dr. Musonda Mumba is Chief of the Terrestrial Ecosystems Unit, based in Nairobi, at the United Nations Environment Programme. In her keynote, Dr. Mumba led participants on a journey through the African continent, from Morocco to Uganda, Rwanda, and Lesotho.

In these examples, Dr. Mumba illustrated challenges and opportunities for the implementation of the Sustainable Development Agenda 2030 in Africa, highlighting the need for intersectionality in approaching the Sustainable Development Goals (SDGs). The presentation started with an insight on sustainable tourism, taking the case study of Morocco. The industry of tourism has been heavily affected by the COVID-19 crisis. The exceptional situation at this moment in time is raising awareness on other pre-existing issues further exacerbated by the crisis that also require action. An example is the marginalization of rural spaces, which often result in challenges and conflictual issues. Investments are therefore needed to allow for accessibility of remote rural mountain areas. Another challenge not to be underestimated is related to women and youth whose livelihoods depend heavily on tourism. These groups are the most vulnerable and therefore in need of support in times of crisis.

Some countries, such as Uganda and Rwanda, are becoming increasingly aware of the exceptional value that their natural environments have for the local economy. This is the case, for instance, for the Virunga National Park. This forest is as beautiful as it is fragile, requiring extreme measures such as the banning of the use of charcoal to limit the degradation of mountain gorilla habitat. Such policy shifts aim to limit deforestation and other activities that would threaten the survival of the gorillas, recognizing the need to

use resources differently in order to allow the continuation of this tourism, since it is a main source of income.

The above presented examples are a manifestation of the intersectionality of the Sustainable Development Goals (SDGs), linking SDG 15 (“life on land”) to SDG 13 (“climate action”), requiring efforts towards SDG 9 (“industry, innovation and infrastructure”), the inclusion of considerations on SDG 5 (“gender equality”), and so on. The ongoing pandemic has taught to think carefully about current challenges and future opportunities, re-thinking the narrative and branding of the mountain landscape by taking all these aspects into consideration.

3.5 Joseph Stiglitz: How to build a better and greener world economy after the pandemic?

Chair: Harald Pechlaner

The final keynote of the conference was given by Prof. Joseph Stiglitz, a US-American economist, public policy analyst and professor at Columbia University. He is a former senior vice president and chief economist of the World Bank and recipient of the Nobel Memorial Prize in Economics (2001). In 2011, *Time* magazine listed him as one of the 100 most influential people in the world. In his speech at the GMS forum, Prof. Stiglitz addressed key learnings from the COVID-19 pandemic and possible strategies for a sustainable recovery of the global economy.

Lessons learned from the pandemic: The role of populists and demagogues

According to Prof. Stiglitz, the different ways in which different countries have been dealing with the pandemic have provided a kind of natural experiment from which social scientists can draw a variety of inferences. He argued that, when looking at countries that have been performing poorly in their response to the virus (e.g., India, US, Brazil), one can identify a set of patterns or commonalities. A central commonality is that many of these countries are headed by authoritarian-like figures who have repeatedly been engaged in campaigns of mis- and disinformation of the public for their own advantage. This has caused widespread scepticism against advice from the scientific community among their followers (e.g., about the importance of social distancing and wearing masks). Furthermore, demagogues like President Trump or President Bolsonaro have tried to undermine principles Prof. Stiglitz referred to as “enlightenment values” in his book *People, Power and Profits* (2019). These principles (e.g., the rule of law, the separation of powers, the trust in and fostering of scientific research) are pivotal in the ability of political and economic institutions to manage complex modern societies. By undermining them, these leaders have also damaged the sense of solidarity and trust that is crucial in responding to a pandemic.

The role of neoliberal economy and government

Beyond the role of authoritarian-like political leaders Prof. Stiglitz also talked about the insufficient resilience of economies as a major reason for the dramatic impacts of the COVID-19 pandemic. He argued that the short-termism of American-style capitalism and its focus on efficiency and short-term profits at the expense of the ability to manage risks were a major driving factor of the lack of resilience of markets in

the US as well as in other countries. The related neoliberalisation processes have been dominating the US economy for the past 40 years and went hand in hand with the denigration of the role of the government. Without the willingness of states to invest in national risk protection (e.g., by creating and maintaining a national stockpile of masks, protective gears and ventilators), when the pandemic struck, countries like the US were unable to respond. Similarly, after Trump had defunded organizations like the *Center for Disease Control and Prevention*, the US was incapable of producing the tests needed and to engage in contact tracing. Even though a pandemic is essentially an issue of externalities and, as such, should be a concern of the public sector, the success of neoliberalism has, according to Prof. Stiglitz, contributed to a neglect of this basic truth of societal organization.

The role of public health and inequality

The epidemic has also exposed a number of weaknesses in contemporary societies. According to Prof. Stiglitz, COVID-19 is not an equal opportunity virus because it is more dangerous for those with weak health conditions. As people living in countries without a proper health care system and high levels of social inequality are more likely to suffer from poor health conditions, they are also more vulnerable and exposed to the virus. This is also the case in the US, where there is a huge problem of health disparities, despite its high per capita income. Furthermore, as Prof. Stiglitz highlighted, economic inequalities were exposed and exacerbated by the pandemic. People at the bottom did not only have less opportunities for adequate treatment, they also suffered economically far more. Many lost their jobs and could not earn a living anymore. At the same time, however, a few at the top have made incredible amounts of money and profited economically from the crisis. Therefore, for the US, Prof. Stiglitz and others speak of a bifurcated society and a K-shaped recovery.

Strategies for a global recovery: What should the recovery look like?

Based on these insights and lessons learned from the COVID-19 pandemic, Prof. Stiglitz urges that when looking forward and thinking about strategies for a global recovery, one should first think about what kind of recovery is desired. As the crisis has exposed numerous problematic aspects of modern economies and societies, it should not be aimed for them to just bounce back to where they were before. Instead, the crisis should be used as an opportunity to build the economy back better than before. This includes considering issues like climate change and biodiversity loss, which have continued during the pandemic with very concrete and increasingly dramatic consequences. For Prof. Stiglitz, any attempt to rebuild the economy after the pandemic should aim at a more sustainable, greener, more equal, more knowledge-based and more digital society.

The need for global cooperation and solidarity

To become more resilient, global supply chains need to be diversified and more regional. This could pave the way for a new kind of globalization based on values like cooperation and solidarity. As Prof. Stiglitz argued, a global recovery from the pandemic can only be achieved, if all countries and all people are protected equally. For that to be possible, countries, organizations and scientist all around the globe need to work together to make sure a vaccine and therapeutics for COVID-19 are allocated in a way that reflects

the priorities for dealing with the pandemic on a global level. Thus, multilateral institutions such as the WHO and the IMF become crucial. Even though these organizations are far from being perfect, Prof. Stiglitz considers them decisive for the coordination and provision of resources on an international level that allow countries to have a robust recovery. They should thus be strengthened, keeping in mind that a global recovery from the pandemic is only possible if it is achieved everywhere.

Economic support for the private sector and debt restructuring

At the level of individual countries, providing economic support for the private sector is vital to mitigate the economic downturn, stop the vicious circle the pandemic entails and speed up the recovery process, according to Prof. Stiglitz. These supports from the government should be distributed equally and benefit the most vulnerable, while also being tied to conditions that bind corporations and businesses to commit to certain social and ecological standards and goals. Compared to the global financial crisis of 2008, Prof. Stiglitz expects the economic recovery of the COVID-19 crisis to be more difficult. This is mostly due to the now much lower growth rates of China, which had propelled the global economic recovery in the aftermath of the 2008 crisis. As a result of lacking resources to manage the recovery, many countries around the world are likely to become indebted. In order to address this problem, Prof. Stiglitz and others have proposed an international framework for restructuring sovereign debt (see https://www.cigionline.org/sites/default/files/sovereign_debt_restructuring.pdf). This framework could accelerate the global recovery process and help to prevent more suffering due to the economic consequences of the pandemic.

For more details on this Keynote, please see [here](#).

4. Thematic sessions

4.1 Thematic session 1: Global developments and critical issues in sustainability in mountain regions

Chair: Paola Fontanella Pisa

The first thematic session was introduced by Paola Fontanella Pisa, researchers for the GLOMOS Programme at UNU-EHS and Eurac Research. The session saw a total of six online presentations, addressing global developments and critical issues in sustainability for mountain regions. Tackled challenges included demographic changes and shrinking rural regions in Europe, as well as issues related to reducing emissions produced by both touristic and agricultural activities.

Many case studies presented in this session were based in South Tyrol, introducing a representative local perspective on how impacts of climate change and increasing pressures can be limited with the adoption of new technologies and the promotion of horticulture for rural mountain communities. From these presentations it resulted that, despite the high quality of life and the presence of attractive public institutions, South Tyrol will have to face several challenges in order to remain competitive and become even more socially sustainable in the future.

Other presentations within this session offered a more international perspective, for example provided by representatives of the International Atomic Energy Agency (IAEA), who presented their efforts towards understanding climate change impacts on soil and water, by using nuclear and isotopic techniques.

Another very insightful presentation, concluding this first thematic session and building on the keynote of Prof. Klein, was the presentation “Adaptation at Altitude: Taking actions in the mountains”, a global and transdisciplinary programme led by UN Environment Programme and the international mountain community.

4.2 Thematic session 2: Natural resources and sustainability in mountains

Chair: Andreas Dibiasi

Thematic session 2 was moderated by Andreas Dibiasi, senior researcher at the Center for Advanced Studies at Eurac Research. The session focussed on natural resources and sustainability in mountains. It was shown how monitoring the climate resilience of indigenous peoples in the Andes offers a view of alternative approaches to tackle environmental change, while participatory nature-based solutions offer promising additional ways to deal with environmental challenges. Cultural differences among single ethnic groups are shown to influence the ways in which communities use natural resources in the case of the Hutsuls living in the Carpathian Mountains on the border between Romania and Ukraine. Since the moment of their division through a national border, the attitude towards the forest has diverged between the Ukrainian and Romanian Hutsuls. In the Maloti-Drakensberg mountains in southern Africa a community initiative is restoring and managing the local municipal water infrastructure in a complex environmental and political context.

Landscapes provide societies with archives of past climatic changes but deciphering these archives requires extensive fieldwork. A project in the Russian Altai identified which landscapes can be used as proxy data to track past and current environmental changes. In South Tyrol, Italy, the BLUESLEMON project is developing a low-cost automatic system to monitor landslides and avalanches using the Internet of Things, in particular drones. In the high mountain regions of Central Asia, climate information and modelling is key to ecosystem-based adaptation planning.

4.3 Thematic session 3: Tourism and sustainability in the mountains

Chair: Mirjam Gruber

Thematic session 3 addressed the main topic of tourism and sustainability and was facilitated by Mirjam Gruber, researcher at the Center for Advanced Studies at Eurac Research. Thematic Session 3 saw five presentations touch upon topics that varied from the valorisation of local cultural heritage, mountain facilities, and hiking routes, with case studies from South Tyrol to Armenia and Georgia.

Ecotourism has become a buzzword in the Armenian tourism industry. Through a strategic assessment, hiking trail ecotourism is presented as one potential sustainable tourism option in the country with viable possibilities for involvement of local communities due to low barriers of entry into the industry. However, infrastructure and nature conservation need to be improved and maintained. In the neighbouring country Georgia, tourism has also seen an increasing trend in recent years and livelihood strategies in rural areas are shifting away from traditional agriculture to economic activities based both directly and indirectly on tourism. Research in the country reflects on the impact of such a shift on rural culture. Similarly, in South Tyrol, the cultural sustainability of tourism is investigated with regards to transhumance practices that are impacted by the growth in tourism. Results show that opinion is divided in two municipalities of South Tyrol as to the impact tourism is having on local cultures. A second case study from South Tyrol applied the sustainability concept in the Carezza Dolomites “Mountain Experience” and showed the practical steps being taken to reduce CO2 emissions and contribute to the SDGs while maintaining a profitable private business.

4.4 Thematic session 4 (A): Sustainable governance in mountain regions

Chair: Jess Delves

Thematic Session 4A has been introduced by Jess Delves, researcher for the GLOMOS Programme at UNU-EHS and Eurac Research. All presentations discussed the need to involve multiple stakeholders across different levels in planning decisions. Particularly, this was most obvious when planning is done within a larger framework or programme (i.e., UNESCO WH, Biosphere Reserve) however it was mentioned to a lesser extent in all presentations. One presentation identified certain barriers to the achievement of the SDGs which relate to a disconnect between CCA and the SDGs and their respective stakeholders, as well as poor cover of indicators from social and economic vulnerability. Some presentations proposed tools for communication in order to engage policy makers and stakeholders, these included: indicator optimization

and simplification; ecosystem services approach; school classes/workshops. Some research also proposed solutions for risk mitigation and presented case studies of these solutions.

The importance of mountain ecosystem services was highlighted in the Maloti-Drakensberg mountains of southern Africa, where lowland populations depend on the provisioning and regulating services provided by the region's mountains. Specific nature-based solutions for sustainable development were proposed in the presentation of the OPERANDUM project which works to reduce hydro-meteorological risk in rural areas. Specifically, one presentation investigated the protection of culture from natural hazard risks in UNESCO sites. Using georeferenced data, this research showed that around a quarter of UNESCO sites are at risk of landslides and that it is not only tangible, but also intangible culture that is at risk. In the Caucasus mountains, research showed that the fall of the USSR has decentralized conservation governance, opening the mountains to the markets as the economy was liberalized. This has led to competing forces in conservation and exploitation of the mountains, where tourism is a main source of contention between competing groups. Whereas in the Biosphere Reserve "Salzburger Lungau," diversity in stakeholder is seen as an asset to conservation practices and the research used network analysis to investigate resilience. However, it found that there is an imbalance in focus of sustainability actions: focus on economic sustainability to detriment of sociocultural and environmental sustainability.

4.5 Thematic session 4 (B): Sustainable governance in mountain regions

Chair: Sofía Panchi Robles

Thematic Session 4B has been chaired by Sofía Panchi Robles, programme associate at UNU-EHS for the GLOMOS Programme. Sustainable development is analysed in the Rwandan context and the economic losses associated with climate change calculated and quantified. Successful adaptation policies need to respond to new decision criteria and be flexible, while analysts should make use of tools and methodologies to evaluate and communicate political solutions.

In the START project, new technology is being developed to identify, assess, and reduce risk of disaster in heavily visited mountain areas. The technology will also aid in alpine rescue operations, as well as help inform park authorities' decisions on resource management.

The importance of stakeholder engagement is insisted upon in the presentation of sustainable development in the agricultural sector, where farmers are key stakeholders and must be engaged in cooperation and partnership. Similarly, in France's natural regional parks, empowering and networking local actors was found to be key in establishing local and sustainable food supply chains. The importance of a participatory approach to the identification of key ecosystem services associated with mountain lakes was also highlighted in the CLAIMES project.

5. Workshops

5.1 Workshop A: Mountain sustainability and Olympic Games: Milano – Cortina 2026

Chair: Mara Manente

At the beginning of the session, Dr. Mara Manente, director of the International Centre of Studies on Tourism Economics (CISET) at the University Ca' Foscari Venezia, gave an input presentation in which she talked about major sporting events and the opportunities and impacts that they entail. For her, major sporting events are not only a competition but also a business and a show. She explained that the literature identifies three “diamond tips” related to major sporting events, which are economic growth, the legacy of investment in infrastructure and the brand and promotion of an image. The main goal should be to use an event as an instrument in the development processes of a destination. Furthermore, it is crucial that sustainability conditions are guaranteed.

Events should thus be looked at as complex, multidisciplinary systems including a broad variety of aspects that need to be implemented and managed at various levels. The most important stakeholders are on the one hand participants and attendees, and on the other hand the event management (where the production processes are situated), which is divided into primary event stakeholders (partners/sponsors, suppliers) and secondary event stakeholders (local institutions, local economic and production systems, media, host community). When looking at the sustainability of sporting events, assessing their impacts in different dimensions becomes crucial. These dimensions are economic, socio-cultural, environmental, marketing/tourism and politics. Fostering sustainability implies identifying the possible positive and negative effects of an event and trying to minimize the negative effects while maximizing the positive ones.

In this context, intelligence systems play a crucial role. For Manente, monitoring processes to identify and measure indicators should be embedded in broader development strategies and objectives. Only then can acceptable thresholds (e.g., in the environmental dimension) be formulated and a meaningful interpretation of data be possible. Monitoring should thus be part of a larger intelligence system that involves the definition of goals, the collection and interpretation of data and the allocation of responsibilities.

Manente then used the example of the Torino 2006 Olympic Winter Games to show a variety of indicators for the dimensions mentioned above. Moreover, she illustrated lessons learned from the economic side, focusing on the phenomena of the multiplier effect, the leakage effect and on the new services provided for the community. Manente concluded her presentation by summing up important factors of success for major sporting events.

The subsequent discussion revolved mostly around four topics: the role of environmental sustainability in the organization of sporting events, the importance of the context and an overall development strategy when defining concrete measures, the concept of responsibility (which must be assumed by different actors at different levels) and the need to develop comprehensive intelligence systems that go beyond the mere collection of data.

5.2 Workshop B: COVID-19 and sustainability governance in mountains

Chairs: Joerg Szarzynski and Sofía Panchi-Robles

Workshop B has been co-chaired by Dr. Joerg Szarzynski and Sofia Panchi-Robles, respectively co-Head and Programme Associate of the GLOMOS Programme at UNU-EHS office in Bonn. The session dealt with the very current issue of the impact of COVID-19 in mountain regions, which presents challenges and opportunities for sustainability governance. The issue has been approached under an international point of view by four panellists, who presented the case study mountain regions in Ecuador, Hindu Kush-Himalaya and South Africa.

First panellist was Dr Eklabya Sharma, from the International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal, representing the Hindu Kush-Himalaya (HKH) region. Dr. Sharma introduced the comprehensive policy paper on the “COVID-19 impact and policy responses in the Hindu Kush-Himalaya region”, recently published by ICIMOD. Participants to the GMS Forum can access this document through the conference materials on the GMS Forum website.

The second intervention moved the focus from Asia to southern Africa, represented by Prof. Christo Heunis, from the Centre for Health Systems Research and Development, and Dr Alice Ncube, from the Disaster Management Training and Education Centre for Africa (DiMTEC), UFS, Bloemfontein & Phuthaditjhaba, South Africa. In South Africa, COVID-19 is overlaying with other persisting health crises, such as tuberculosis and HIV/AIDS. Since health care is a public good and human right, good governance must ensure equitable health care financing.

The section concluded with the presentation of Mrs. Carmen Tiupul, representing the Confederation of the Indigenous Movement of Chimborazo (COMICH), Riobamba, Chimborazo Province, Ecuador. Reporting on the situation within the Latin American Andes, Mrs. Tiupul presented the impacts of COVID-19 in the specific case of the Ecuadorian Andes, Chimborazo Province. Carmen Tiupul, a Kichwa Puruwá woman, shared her insights on the impacts of COVID-19 in the Ecuadorian Andes, specifically in the Chimborazo Province. Vulnerability is accentuated due to existing inequalities, lack of basic services, lack of access to education and health systems. The pandemic has caused rural-urban-rural migration, and the local communities have effectively responded thanks to their organizational structures and traditional knowledge.

6. Public Event: Open session on sustainable management of protected areas

Chair: Harald Pechlaner

The evening of Monday 5th October 2020 celebrated the first edition of the GMS Forum with a public event on sustainable management of protected areas. The session was moderated by Harald Pechlaner, Director of the Center for Advanced Studies, and opened by a talk given by the renowned alpinist Reinhold Messner, followed by a discussion panel with four local experts: Marcella Morandini (Director of the Dolomites UNESCO Foundation), Susanna Sieff (Director of Sustainability, Cortina 2021), Wolfgang Töchterle (IDM Marketing Director), Simone Wasserer (innkeeper from Innichen, South Tyrol).

6.1 Sustainability in mountain areas

Speaker: Reinhold Messner

According to Messner, the boundaries between cultural and natural landscapes untouched by human activity have become increasingly blurred. Ever-larger parts of high mountain regions are made easily accessible through the construction of cable cars and other newly built infrastructure. Messner believes that this development comes with the risk of undermining the majesty that characterize mountains and mountainous landscapes. While he therefore stresses the need to counteract this tendency, he also acknowledges that human interaction with natural landscapes is not negative per se. Mountain farmers have been living in harmony with their surroundings for hundreds of years, making use of their natural environment in a respectful way and taking care of it, thereby contributing to its richness, beauty and diversity. It is their traditional local knowledge and mountain competence that needs to be revived, preserved and developed in order to be able to maintain and protect cultural landscapes in high altitude regions. In addition, development strategies for mountain regions should focus on the reuse and upcycling of existing structures rather than the construction of new ones. For Messner, narratives play a central role in the endeavour to shape the future of mountain regions. He views them as a vital instrument to guide development in a sustainable direction.

6.2 Public Event: Open session on sustainable management of protected areas

Challenges of sustainable development in mountain areas: Governance, mobility and major events

Speakers: Marcella Morandini, Susanna Sieff, Wolfgang Töchterle, Simone Wasserer

Following Reinhold Messner's talk, Marcella Morandini, Director of the Dolomites UNESCO Foundation, Susanna Sieff, Director of Sustainability, Cortina 2021, IDM Marketing Director Wolfgang Töchterle and Simone Wasserer, innkeeper from Innichen, South Tyrol, discussed about the challenges of sustainable development in mountain areas. The panel discussion was moderated by Harald Pechlaner and focused in particular on issues related to governance, mobility and major events. There was a consensus among the panellists that sustainability should not be viewed as a goal related to just one specific area. Rather, it should be thought of as a net of interwoven goals that encompass a variety of social, political, economic and environmental dimensions. In order to be able to achieve these goals, a common narrative is necessary

that is supported and shared not only by decision-makers, but also by the resident population and guests. What is more, the role and importance of cross-regional cooperation for the strengthening of a common vision of sustainability and the implementation of sustainability monitoring systems was emphasized. Major events were identified as potential laboratories for sustainable collaboration and the operationalization of a common vision of sustainability. Beyond that, supporting and fostering local supply chains was highlighted as an important instrument for the sustainable development of a region. However, the panellists also argued for the integration of global partners into the local context and, in the other direction, the integration of local actors into the global context.

7. Closing remarks

Presented by: Harald Pechlaner and Stefan Schneiderbauer

This first edition of the Global Mountain Sustainability Forum represented a valuable opportunity for both presenters and participants to engage in meaningful discussions delineating current challenges and opportunities for mountain sustainable development. Many are the lessons learned from these two days, summarised in the final session by the head of the Center for Advanced Studies, Harald Pechlaner, and the head of the GLOMOS Center in Bolzano, Stefan Schneiderbauer.

It is undeniable that the impacts of global change processes, particularly of climate change, are affecting mountain areas to a greater extent than the lowlands, even though the majority of drivers for these processes are related to activities and dynamics in the lowlands. Against this background there is a particular urgent need to ensure sustainable development within sectors like water and tourism, which are of uttermost importance for many mountain regions and characterised by a strong direct connection to the lowlands. While the challenges for mountain areas are often the same internationally, the adequate solutions to these problems depend on the local context. Ideally, they should complement expert knowledge with participatory approaches to include the local population and other non-scientific stakeholders as well as local knowledge. In addition, fostering international networks, cooperation and knowledge transfer is essential for facilitating the sharing of and learning from existing expertise and experiences made by other mountain regions.

The tourism sector, which has been hit particularly strong by the Covid-19 crisis, will have to take on responsibility in the wake of the pandemic and increasingly direct attention and efforts towards the reconciliation of tourism and sustainability. In this endeavour, central issue areas involve, among others, public health, social inclusion, biodiversity conservation, cultural heritage, circular economy and climate action. More generally, the role of tourism in providing sustainable livelihoods should take on added significance in the future, in mountain areas but not only. As part of this wider process of sustainable reorientation, it can already be observed today that tourism and travelling are starting to shift from being perceived as a purely economic product to becoming an integral part of a new, modern lifestyle.

In the context of sustainability transformation, governance plays a major role. This includes, for instance, the definition of objectives, binding targets and an overall development strategy, the implementation of comprehensive monitoring systems and the integration of broader frameworks with local perspectives and needs. For mountain regions, governance is a particularly sensitive and important topic since decisions concerning the development in mountains are often made in non-mountain metropolises. The connected processes of decision-making often fail to acknowledge local implications and local needs that eventually will have an impact on those non-mountain realities as well. In this context, also digitalisation needs to be understood as an opportunity to improve the quality of life in mountain areas and, consequently, be fostered through adequate policies. In relation to tourism, focusing on the interfaces of digitalisation and sustainability could contribute to preventing over tourism and reorienting the management of tourist experience chains. Furthermore, for the deliberate shaping of mountain futures to be possible, narratives play a crucial role. Beyond challenging predominant social imaginaries that often reinforce unsustainable

patterns of behaviour, one should strive to formulate and strengthen alternative narratives and visions of sustainability that can serve as instruments in the endeavour to transform societies towards more sustainable futures.

International frameworks, particularly the Agenda for Sustainable Development 2030 and the Sustainable Development Goals (SDGs), emphasise the need for more evidence to guide policy and decision making. While they helped to create a framework of ambition at different levels and raised awareness about the importance of sustainability across all sectors, there remain major issues related to monitoring of the achievement of the established goals. In order to provide reliable information about the respective progress, the need for new policies or the improvement of existing ones, with a better data coverage with a collection of more context-relevant and timely evidence is a prerequisite. Another lesson learned from working within the context of the Agenda 2030 is the high level of inter- and transdisciplinarity of the SDGs. It appears clear that these goals are representative of issues intertwined with each other and that it is not possible to address a single objective individually. Against this background it is worth underlining that sustainability itself is not best conceived of as an isolated *objective* to be achieved, but rather as a *process*, a journey that policy makers, stakeholders and all parties involved should walk jointly.

Finally, a few words must be spent about the unprecedented crisis that has been affecting the world over the past year, inviting a reflection on the implications for mountain communities as well. The COVID-19 pandemic has opened up a crucial point in time in which societies around the globe find themselves at a crossroads. They have been forced to slow down, with dramatic economic, social and psychological consequences. At the same time, the standstill has offered the opportunity to reflect on current unsustainable practices and to re-evaluate and re-think existing long-term strategies. Testing the resilience of societies worldwide, the COVID-19 pandemic is also a huge opportunity for them not to just aim at bouncing back to where they were before the crisis, but to deliberately take the path of necessary changes for a more sustainable future.

8. Special Issue – CALL FOR PAPERS

The scientific organising committee of the GMS Forum is delighted to announce a Special Issue in collaboration with the open access journal Sustainability: [“Sustainability Governance: International Frameworks and Local Contributions with Special Consideration of Mountain Areas”](#).

This Special Issue aims at addressing sustainability governance at the crossroads between international frameworks and local contributions, particularly in mountainous regions, focusing on the topics of tourism and natural resource management.

Contributions from various disciplines, theoretical and empirical oriented research papers using either quantitative or qualitative methods are welcome. In this Special Issue, the aim is to cover key issues in sustainability governance in mountain regions. Particularly welcomed are topics including (but not limited to):

- Global developments and critical issues in sustainability, such as climate change, over tourism, demographic change, energy transition, or the COVID-19 pandemic;
- Natural resources and sustainability, such as integrated catchment management, climate resilience, or supply and demand issues between highlands and lowlands;
- Tourism and sustainability in mountain areas, such as tourism activities, assessing developments in tourism against sustainability objectives, societal transformation processes related to tourism or cultural sustainability;
- Sustainable governance and its potentials and limitations, e.g., successful management of natural resources within the context of competing users, disaster risk reduction within the context of changing climate conditions and increasing touristic activities, sustainable management of natural resources in protected areas, or local empowerment and participation.

The papers submitted and selected for this Special Issue should not have been previously published nor be under consideration for publication elsewhere and will be subjected to a double-blind peer review process. An article processing charge will apply to articles accepted for publication, though **participants of the GMS Forum 2020 are entitled to a 50% discount**.

For further information, please visit <https://gms-forum.eurac.edu/>.

Guest Editors:

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Please submit your manuscript at any time until **31 May 2021** [here](#).