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The Role of Culture in Climate Resilient Development

UCLG
United Cities
and Local Governments

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UCLG CULTURE COMMITTEE

United Cities and Local Governments (UCLG) is the world organization created in 2004 which represents local and regional governments and defends their interests on the world stage. It currently represents 70% of the global population, and it is the association of cities with the most members, and with the greatest capacity of influence before the United Nations. The World Secretariat of UCLG is based in Barcelona.

UCLG has an important cultural programme based on the **Agenda 21 for Culture**, approved in Barcelona in May 2004, on the Declaration "**Culture is the 4th pillar of Sustainable Development**", approved in Mexico City in November 2010 , and on the practical toolkit **Culture 21: Actions**, approved in Bilbao in March 2015.

The **UCLG Culture Committee** is a unique global platform of cities, local governments, associations, organizations and networks that cooperate and promote the role of Culture in Sustainable Cities. The mission of the UCLG Culture Committee is to promote culture as the fourth pillar of sustainable development through the international dissemination and the local implementation of Agenda 21 for culture, and to foster and make more explicit the relationship between local cultural policies and sustainable development. The narrative is based on human rights, good governance, people-centered development and the co-creation of the city.

Through its commitment to climate action and the increased awareness of the impacts of climate change from a local perspective, United Cities and Local Governments (UCLG) has framed this report within several documents, such as the principle of ecological transition in the **UCLG Durban Political Declaration**; the UCLG manifestos "**Ecology for the Future**", "**The Future of Culture**" and "**The Future of Resilience**"; the Resilience Modules of training of trainers, and the commitments to transform the planet in the **UCLG "Pact for the Future"**, to be shaped in 2021-2022. Also, the UCLG Committee on Culture stepped towards the engagement with climate action and its relation to culture, dedicating one of the nine commitments of Culture 21 Actions to "Culture and environment" and publishing a briefing in "**Culture, Climate Change and Sustainable Development**".

Website: **www.agenda21culture.net**
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The report "Culture in Climate Resilient Development" is an attempt to document the initiatives of cities and local or regional governments from all continents on cultural policies, sustainable cities and climate resilient development. It includes a diverse pack of case studies from all across the world and addressing the whole set of the 2030 Agenda Sustainable Development Goals (SDGs).

This document was open for contributions until July 2021. The report was presented as a draft on 9 September 2021 at the UCLG Culture Summit held in Izmir and Online, at the workshop session "Culture and the Climate Emergency. Local Experiences towards COP26". The final version was published on 5 November 2021. This report has been commissioned by the Secretariat of the UCLG Culture Committee in collaboration with the Climate Heritage Network (Working Group 5). It has been jointly coordinated by Andrew Potts (Climate Heritage Network - CHN) and by Agnès Ruiz and Sarah Vieux (UCLG Culture Committee), with the support of Marta Llobet and Jordi Pascual.

The Secretariat of the UCLG Culture Committee expresses gratitude to all those who have contributed to this report. The draft received comments, observations and suggestions from our colleagues of the UCLG World Secretariat, namely, Edgardo Bilsky, Anna Calvete, Ainara Fernández, Fátima Fernández, Amanda Flety, Sara Hoeflich, Pablo Sebastián Mariani, Rodrigo Messias, Prachi Metawala, Jaume Puigpinós, Maria Alejandra Rico, Cécile Roth, Fernando Santamauro, Firdaous Oussidhoum, Jean Baptiste Buffet, Juan Carlos Uribe, and Pablo Fernández. The Secretariat of the UCLG Culture Committee also expresses gratitude to all the other colleagues in the UCLG World Secretariat and a warm recognition to Emilia Saiz, UCLG Sercretary General, for her great leadership in this field within all the bodies of UCLG.

A special gratitude to the persons who submitted projects during the open call for contributions: Madhu Vottery, Ananya Bhattacharya, Yasmeen Lari, Shanon Miller, Queen Quet Marquetta Goodwine, Stephen Wyber, Ileana Ceron Palma, Thobile Chittenden, Aoife Kirk, Lisa Sentimenti, Ibrahim Tchan Issifou, Ozden Coskun Oner, Daniele Pagani, Jorunn Jernsletten, Jaume Mata, Ivana Katurić, Elodie Heberle, Emma Taylor, Keith Jones, Brenda Asunción, Yael Pantzer, Sinite Yu, Susan Ross, Julianne Polanco, Daniel Lodge, Nathan Lott, Ivette Gauri Garcia Medina, Mercedes Cardenas, Ning Liu, Maarten Ouboter, Ann Bourgès, Mauro Garcia, Sylvia Amann, Paolo Motta, Yky, Sari Uricheck, Stephanie Seacord, and Patricia Diaz.

The Role of Culture in Climate Resilient Development

Report written by Andrew Potts

Preface

It has been seven years since the Intergovernmental Panel on Climate Change (IPCC) first made the arresting declaration that climate change poses a 'severe threat' to future sustainable development.[1] In the years that have followed, the concept of Climate-Resilient Development Pathways (CRDPs) has emerged as a key process for capturing the broad and multifaceted interplay between sustainable development (including its focus on eradicating poverty and reducing inequality) and the deep reductions in greenhouse gas emissions and transformative climate adaptation also needed to tackle the climate emergency.

According to a more recent IPCC report, 'identifying and negotiating socially acceptable, inclusive and equitable pathways towards climate- resilient futures is a challenging, yet important, endeavour, fraught with complex moral, practical and political difficulties and inevitable trade-offs.'[2] Efforts so far have proved partially successful yet, not surprisingly, demonstrate 'notable obstacles.'[3]

In all contexts, the IPCC said, the transformations towards sustainable development in a warmer world involve a set of enabling conditions without which these dual goals are 'difficult if not impossible to achieve'[4] — and among these are attention to culture and values. Indeed, climate scientists have consistently listed culture as a central condition for transformative climate action.[5]

This robust role assigned, at least in theory, to culture is consistent with a growing body of research and practice on culture as a pillar of sustainable development. This same body of work does not, however, necessarily show an equally robust trend towards

1 Denton, F., T.J. Wilbanks, A.C. Abeysinghe, I. Burton, Q. Gao, M.C. Lemos, T. Masui, K.L. O'Brien, and K. Warner, 2014: Climate-resilient pathways: adaptation, mitigation, and sustainable development. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1101-1131.

2 Roy, J., et al., 2018: Sustainable Development, Poverty Eradication and Reducing Inequalities. In: Special Report on 1.5°C. In Press. [Hereinafter 'IPCC Sustainable Development Chapter'], 472.

3 Id. at 448.

4 Id. at 477.

5 IPCC Sustainable Development Chapter, 449, 475.

grappling with societal transformation and deep greenhouse gas reduction, nor an ambitious effort to reconcile inevitable yet difficult trade-offs. This suggests that some culture-based 'sustainable development' efforts are continuing along the very business-as-usual trajectories that have given us climate change — and that is a problem.

It is a problem because creative, cultural, and heritage voices are urgently needed for doing the opposite. That is, to help overcome what climate scientist Isak Stoddard, Kevin Anderson and his colleagues have called the 'epistemological monoculture' that has impoverished the collective global capacity to imagine and realize forms of living not dependent upon fossil fuels and the exploitation of people and natural 'resources.'[6] The world cannot afford business as usual approaches (of which divergent 'sustainable development' and 'climate action' agendas are but one symptom) — and least of all from cultural voices.

This report proposes 'climate resilient development' as a pathway to imagining desirable ways of living neither wedded to the carbon economy nor dependent on unsustainable narratives of progress and sketches some of the ways that arts, culture and heritage enable the realisation of such futures.

6 Three Decades of Climate Mitigation: Why Haven't We Bent the Global Emissions Curve? Stoddard, I; Anderson, K. et al. Annual Review of Environment and Resources 2021 46:1, 653-689. [Hereinafter, 'Three Decades of Climate Mitigation].

Foreword

'The Role of Culture in Climate Resilient Development: Strategies for Strengthening Sustainable Development While Promoting Transformative Climate Action' is an initiative launched by United Cities and Local Governments' Committee on Culture in cooperation with Working Group 5 of the Climate Heritage Network, which UCLG coordinates.

This Report aims to support a better understanding of the cultural enabling conditions for Climate Resilient Development Pathways (CRDPs) and to offer insights into how cultural actors can support delivering CRDPs towards a 1.5°C warmer world. CRDPs describe trajectories that pursue the dual goals of strengthening sustainable development while pursuing transformative climate action.[7]

One of the defining recent treatments of the topic of CRDPs is the 2018 publication of the Intergovernmental Panel on Climate Change entitled 'Sustainable Development, Poverty Eradication and Reducing Inequalities' which was published as a chapter of 'Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C.'[8] This chapter takes sustainable development as the starting point and focus for analysis. It considers the broad and multifaceted bi-directional interplay between sustainable development, including its focus on eradicating poverty and reducing inequality in their multidimensional aspects, and climate actions in a 1.5°C warmer world. The chapter also examines synergies and trade-offs of climate action options with sustainable development and offers insights into possible pathways, especially climate-resilient development pathways towards a 1.5°C warmer world.

The 'Sustainable Development, Poverty Eradication and Reducing Inequalities' chapter identifies culture and values as key enabling conditions for CRDP, along with institutional, economic and technological conditions. Beyond that, however, the Chapter's engagement with cultural conditions is rather limited. The Section of the Chapter devoted to the 'Conditions for Achieving Sustainable Development, Eradicating Poverty and Reducing Inequalities in 1.5°C Warmer Worlds' omits any substantive discussion of culture. Table 5.2 of the Chapter presents a detailed assessment of synergies and trade-offs of individual mitigation options with the SDGs. However, it omits an assessment of the two SDGs which most explicitly address culture and heritage, SDGs 8.9 and 11.4, and fails to mention culture in any of the other assessments.

7 The link between sustainable development and limiting global warming to 1.5°C is recognized by the SDG for climate action (SDG 13), which seeks to combat climate change and its impacts while acknowledging that the United Nations Framework Convention on Climate Change (UNFCCC) is the primary international, intergovernmental forum for negotiating the global response to climate change. The UNFCCC's Paris Agreement correspondingly incorporates sustainable development, describing its objective as aiming to 'strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty.'

8 IPCC, 2018: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V. et al, (eds.)]. In Press [Hereinafter, 'Special Report on 1.5°C'].

This Report utilises key elements of the IPCC Sustainable Development Chapter but attempts to extend them to a deeper and fuller treatment of the topic of culture, including culture as an enabling condition for CRDPs.

The IPCC Sustainable Development Chapter defines sustainable development as 'development that meets the needs of the present and future generations' through balancing economic, social and environmental considerations, and then introduces the United Nations (UN) 2030 Agenda for Sustainable Development, which sets out 17 ambitious goals for sustainable development for all countries by 2030. The Chapter relies heavily on the SDGs as an articulation of the contours of sustainable development.[9] This Report follows that approach.

The IPCC Sustainable Development Chapter emphasises mitigation and adaptation as the key elements of climate action, but also contains a transversal discussion of equity and short discussions of losses and damages, just transition and enabling conditions. This Report follows a similar approach, retaining a focus on climate adaptation and mitigation. In order to emphasise disparate dimensions of transformative climate action, particularly those that correlate strongly to cultural enabling conditions, separate discussions of Loss and Damage, and Climate Ambition are provided. Issues of equity and fairness have long been central to climate change and sustainable development[10] and this report correspondingly places a focus on those as well.

This report also operates in the context of the global framework promoted by United Cities and Local Governments (UCLG), which reaffirms its solid commitment to increasing awareness of the impacts of climate change on a local level, and to the implementation of a sustainable, green transition agenda to enhance the mitigation and adaption, as well as foresee potential for reversibility of those impacts. This commitment is developed through the prominent role given to environmental, biodiversity and climate change measures in the Agenda 2030; the guiding principles set out by the **Climate Heritage Network**; the principle of ecological transition in the **UCLG Durban Political Declaration** and in the UCLG manifestos "**Ecology for the Future**", "**The Future of Culture**" and "**The future of Resilience**", which are guided by an emphasis on solidarity, fairness, sustainable consumption and production, and multi-level governance, and the commitments to transform the planet in the **UCLG "Pact for the Future : For people, for the Planet and for the Government**", to be shaped in 2021-2022. Global efforts on culture and climate action in 2021 also include the report "**The Missing Link**", by Julie's Bicycle and the British Council, as well as the report "**The Green World Cities of Tomorrow: Culture and Sustainability**", by the World Cities Culture Forum.

9 The IPCC Sustainable Development Chapter does note that there are direct connections from climate to other measures of sustainable development including ethics and climate-resilient development. IPCC Sustainability Development Report, 450.

10 The Paris Agreement states that it 'will be implemented to reflect equity... in the light of different national circumstances' and calls for 'rapid reductions' of greenhouse gases to be achieved 'on the basis of equity, and in the context of sustainable development and efforts to eradicate poverty'. Similarly, the UN SDGs include targets to reduce poverty and inequalities, and to ensure equitable and affordable access to health, water and energy for all.

The project will also be grounded in the principles set out in activities of UCLG Learning, including the ongoing Resilience Modules of training of trainers; and **Culture 21 Actions**, which advocates for the operationalisation of culture in sustainable cities and the effective implementation of cultural policies, programmes and projects at the local level for a people-centred development of local communities. Culture 21 Actions renews the commitments of cities and territories to highlight the interdependent relationship between citizenship, culture, and sustainable development. It supplements the **Agenda 21 for Culture**, approved by UCLG in 2004, and transforms it into nine concrete commitments and 100 concrete actions around the areas of: cultural rights; heritage, diversity and creativity; education; environment; economy; equality and social inclusion; urban planning and public spaces; information and knowledge, and the governance of culture. Culture 21 Actions facilitates the exchange of, and gives visibility to, good practices on culture, including cultural policies, programmes and projects, implemented at the local level.

The report is also one of the tools being delivered as part of the Climate Heritage Network's Madrid to Glasgow Action Plan. The immense potential of culture heritage to drive climate action and support just transitions by communities towards low carbon, climate-resilient futures often go untapped. The Climate Heritage Network aims to flip this paradigm. The Action Plan was designed to help deliver this result via eight scalable culture-based climate action tools and policy solutions designed to dismantle barriers to greater engagement by cultural operators in climate action, and scale up and out culture-based solutions to climate change.

In support of the report, the UCLG Culture Committee and the Climate Heritage Network invited the contributions of cities and local and regional governments, as well as partners, of one or more case studies that illustrate culture-based strategies that pursue the dual goals of transformative climate action and strengthening sustainable development. Case studies could represent a wide variety of strategies, including 'bricks and mortar' development (e.g., real estate, infrastructure); management and planning projects; legislation, policy, financing, or city-to-city cooperation; or public participation, awareness-raising, education or training. A cross-section of the case studies received are presented in [Annex 2] of this report.

The terminology used throughout this report can be found in the glossary of the *IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of Climate Change, Sustainable Development, and efforts to eradicate poverty.*[11]

11 IPCC, 2018: Annex I: Glossary [Matthews, J.B.R. (ed.)]. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press. Available at: **www.ipcc.ch/sr15/chapter/glossary/**

Introduction

"Climate change is one of the greatest challenges of our time and its adverse impacts undermine the ability of all countries to achieve sustainable development."

— Transforming Our World: The 2030 Agenda for Sustainable Development. United Nations General Assembly[12]

Climate Action, including adaptation and mitigation, is fundamentally connected with achieving sustainable development, poverty eradication and reducing inequalities. Every degree of global warming matters. The growing recognition of the importance of limiting warming to 1.5°C in order to avoid the worst impacts of climate change provides a framework for measuring the climate-sustainable development correlation. The climate impacts avoided at 1.5°C of warming compared to 2°C would make it easier to achieve many aspects of sustainable development that communities desire like health, livelihoods, food security, water supply and human security. At the same time, climate scientists have largely been unable to model pathways characterized by inequality and poverty that were still able to limit global warming to 1.5°C.

Climate Resilient Development Pathways to Transformative Change

The IPCC has said that limiting global warming to 1.5°C (with no or limited temperature overshoot) would require rapid and far-reaching transitions in things like energy, land, urban and infrastructure. This will require ambitious and well-integrated adaptation–mitigation–development pathways that deviate fundamentally from high-carbon, business-as-usual futures. Human-caused carbon dioxide (CO2) emissions must be significantly reduced by 2030 with net zero emissions reach by 2050, if not sooner. Such a transition is said to be unprecedented in human history, at least as to scope.[13] The term 'transformation' is often invoked, underscoring the need for urgent and far-reaching changes in underlying practices, institutions and social relations in society.

The concept of climate-resilient development pathways (CRDPs) has been developed to describe transformative trajectories that pursue the duals goal of limiting warming to 1.5°C while strengthening sustainable development. The goals of CRDPs are to meet the short-term SDGs, achieve longer-term sustainable development, reduce emissions towards net zero around the middle of the century, build resilience and

12 A/RES/70/1 (25 September 2015).
13 The question of whether and how past societies have undertaken transformative change is fundamentally one of cultural heritage, anthropology and archaeology – although perhaps not widely treated as such so far.

enhance human capacities to adapt, all while paying close attention to equity and well-being for all.[14] These Pathways are not merely scenarios to envision possible futures but processes of deliberation and implementation that address societal value and local priorities. This entails contestation, inclusive governance and iterative engagement of diverse populations with varied needs, aspirations, agency and rights claims, including those most affected, to deliberate a multiplicity of possible pathways.

The Role of Culture

Physicists and chemists have computed humankind's 'carbon budget,' that is to say the remaining amounts of CO2 humans can put into the atmosphere and still stay below 1.5°C, and the probabilities that various emissions scenarios will allow us to stay within this warming threshold.[15] What these calculations cannot tell us, however, is — fundamentally — what futures do people want to transition to? Whose resilience matters?[16] What types of societal and systemic changes are most workable within any given human system?[17] It is culture, heritage and values, along with other institutional, economic and technological conditions, that supply the answers to these questions. In the jargon of climate policy and science, these are the enabling conditions that will support or defeat achieving low-carbon and resilient pathways and sustainable development.

Culture influences our understanding of the environment and our relationship with it on a deep level. People modify the ecosystems around them through cultural practices, values, and visions of the world. Cultural factors can promote or obstruct social inclusion, deliberation and implementation, making attention to the cultural dimensions of governance and engagement indispensable. Artists, cultural organizations and cultural institutions hold transformative potential by challenging the values that condition life choices, including economic and consumption models. Narratives and storytelling create space for agency, deliberation, co-constructing meaning, imagination and desirable and dignified pathways.

Cultural and creative processes make it possible for individuals and communities to explore their histories and sense of identity, imagine different futures, and promote a dialogue about needs, aspirations and rights. Active participation in cultural life provides the motivation and possibility of increased civic participation, lends cultural visibility to marginalised groups, and fosters mutual recognition and cooperation between different generations and cultures. Culture provides the basis for inter-cultural dialogue and exchange, which fosters interconnectedness, but also embodies endogenous capacities of communities that promote local self-sufficiency, use of local materials, gastronomies and know-how.

14 Cf. 'Manifesto on the Future of Resilience: A Tentative New Understanding of Resilience the Looks Beyond Growth (UCLG 2019) ('A life centred approach will help focus on humankind development as one development, in harmony with nature and its resources. The focus is now beginning to be on health and wellbeing as outcomes of values and principles, like the value of cultural and natural assets.')

15 IPCC, 2021: Summary for Policymakers. In: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, et al. (eds.)]. Cambridge University Press. In Press. [Hereinafter, '2021 WG I Contribution'].

16 IPCC Sustainable Development Chapter, 472.

17 Future of Our Pasts.

The knowledge people have of their surrounding ecosystems is of immense value. Culture is the product of thousands of years of history, and the fruit of collective contributions by all peoples that supports a diversity of knowledge systems, livelihoods, and functions through languages, ideas, techniques, practices, and creations. Cultural diversity and biological diversity are closely related. Cultural groups and networks support a multiplicity of social pathways that result in people having multiple options. Culture is a resource for constructing the identities of people and communities that strengthens social fabric and promotes place attachment.

Cultural consideration address equity in terms of how widely capabilities are distributed within a society; gender considerations; social roles in resource use, sharing and management; and political and economic relations and legal institutions. In the face of cultural extinction from climate impacts, cultural rights are an integral element of human rights, guaranteeing the ability to identify with one or several cultural communities, active participation in cultural life, and access to the knowledge necessary to exercise other rights, freedoms, and responsibilities, as well as to design and take climate action.

Trade-Offs and Synergies

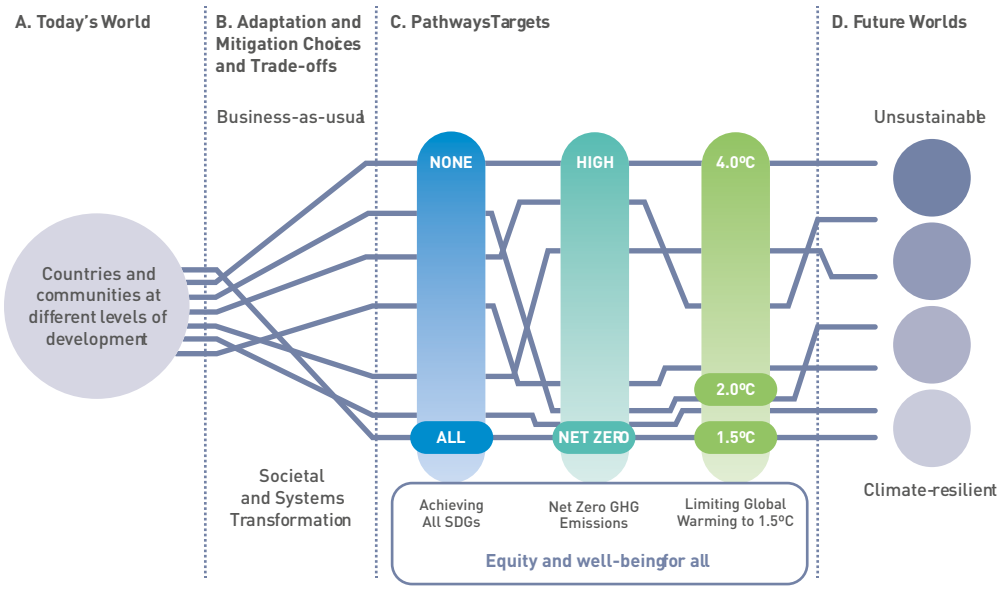
CRDPs open up routes towards socially desirable futures that are sustainable and liveable, but concrete evidence reveals complex and inevitable trade-offs along a continuum of different pathways, highlighting the role of societal values, internal contestations and political dynamics. Climate mitigation and adaptation actions can interact with sustainable development objectives in negative ways, where sustainable development is hindered or reversed. This is known as 'trade-offs.' Or, they can interact in positive ways that strengthen sustainable development, known as synergies. The term 'co-benefits' refers to the positive effects that a policy or measure aimed at one objective might have on other objectives, thereby increasing total benefits for society or the environment.

An example of a trade-off can occur if ambitious climate change mitigation compatible with 1.5°C changes land use

Key Interplays Between Sustainable Development and Climate Action:

- Limiting global warming to 1.5°C rather than 2°C above pre-industrial levels would make it markedly easier to achieve many aspects of sustainable development.
- Compared to current conditions, 1.5°C of global warming nonetheless poses heightened risks to eradicating poverty, reducing inequalities and ensuring human and ecosystem well-being.
- Sustainable development broadly supports and often enables the fundamental societal and systems transformations that would be required for limiting warming to 1.5°C above pre-industrial levels.
- Synergies between adaptation and mitigation response measures with sustainable development and the SDGs can often be enhanced when attention is paid to well-being and equity while, when unaddressed, poverty and inequalities may be exacerbated.

in ways that have negative impacts on sustainable development. A trade-off could occur for some countries, assets, workers and infrastructure already in place if a switch is made from fossil fuels such as coal or peat to other energy sources without adequate planning for such a transition, including attention to cultural traditions and multi-generational livelihoods. Trade-offs can be minimized if effectively managed, as when workers are retrained for employment in lower carbon sectors. It is important to strengthen synergies and minimize trade-offs when planning climate change adaptation and mitigation actions. Unfortunately, not all trade-offs can be avoided or minimized, but careful planning and implementation can build the enabling conditions for long-term sustainable development.[18]



18 IPCC Sustainable Development Chapter, 478.

1. Climate Adaptation and Sustainable Development

Adaptation in human systems refers to the process of adjustment to actual or expected climate and its effects, in order to moderate harm and maximise opportunities. It correlates to Article 7 of the Paris Agreement[19] which established a global goal of enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change. Article 7.5 acknowledges that adaptation action should be 'based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems'.

Humans have already heated the planet by roughly 1.1 degrees Celsius since the 19th century, largely by burning coal, oil and gas for energy.[20] The consequences can be felt across the globe in the form of devastating heat waves, floods and wildfires. According to climate scientists many changes are now essentially irreversible, especially in the ocean, ice sheets and global sea level. So people and communities must adapt to the changes that humans already have caused and plan for future changes.

Culture is an important key to successful climate adaptation,[21] the multi-faceted dimensions of which are increasingly well understood.[22] A recent study prepared by the Climate Heritage Network showed that when climate actions plans do address culture, it is most often in the context of adaptation.[23] Culture is central to understanding and implementing adaptation actions, be they human behavioural change, institutional, or technological adjustments. The identification of risk, decisions about responses, and means of implementation are all mediated by culture. Highlighting the role of heritage in social integration and inclusion supports adaptation, especially by inclusive community stewardship and participatory inventorying and cultural mapping, which can mobilise communities, articulate sense of place and provide a knowledge base to inform adaption decision-making. Relating past adaptability to environmental change to current issues can support present and future adaption.[24]

19 Conference of the Parties, Adoption of the Paris Agreement, Dec. 12, 2015, U.N. Doc. FCCC/CP/2015/L.9/Rev/1 (12 December 2015) [Hereinafter, the 'Paris Agreement'].
20 2021 WG I Contribution.
21 United Nations, General Assembly, 'Climate Change, Culture and Cultural Rights: report of the Special Rapporteur in the field of cultural rights,' A/75/298 (10 August 2020), available from https://www.undocs.org/en/A/75/298. [Hereinafter, 'Cultural Rights Report'], §16.
22 See ICOMOS Climate Change and Cultural Heritage Working Group. 2019. The Future of Our Pasts: Engaging Cultural Heritage in Climate Action, July 1, 2019. Paris: ICOMOS. [Hereinafter, 'Future of Our Pasts'], pp. 35-46.
23 Climate Heritage Network, 2021: Report on the Integration of Culture Heritage in Climate Planning (HiCLIP) [Guzamn, P. Daly, C., Principal Investigators]. ICOMOS. In Press.
24 Future of Our Pasts, 14.

This chapter focuses on the role of culture in realising synergies between adaptation strategies and SDGs implementation. Why types of cultural strategies enhance adaptive capacity while reducing poverty and increasing well-being? SDG 11.4 is based on the premise that heritage safeguarding makes for more resilience cities and human settlements, but how?

1.1. Synergies and Trade-Offs between Adaptation Options and Sustainable Development

Overall, the IPCC Sustainable Development Chapter found that the impacts of adaptation on sustainable development, poverty eradication and reducing inequalities are expected to be largely positive, given that the inherent purpose of adaptation is to lower risks. Many strategies for sustainable development enable transformational adaptation for a 1.5°C warmer world (provided, the IPCC said, attention is paid to reducing poverty in all its forms and to promoting equity and participation in decision-making). The promotion of culture, the protection and exercise of cultural rights and the safeguarding of cultural heritage can have similarly positive interactions.[25]

Sustainable development strategies, including cultural strategies, enable transformational adaptation in several ways. This first is by supporting the adoption of integrated approaches, for instance, those that address poverty or social inequalities rather than addressing current vulnerabilities as stand-alone climate problems. For example, measures that reduce women's vulnerabilities (SDG 5) also allow women to benefit from adaptation. In **Karachi's City's Historic Core**, low-income women were trained in ancient terracotta crafts, ultimately producing over 150,000 cobbles, which become a source of livelihoods while also reducing urban flooding through the expanded use of porous pavements.

Local participation is effective when wider socio-economic barriers are addressed via multiscale planning (ranging from national education efforts (SDG 4) to using local knowledge to enhance information sharing). The proposed **Croatian Coral Centre** aims to raise awareness about the destructive effect that the modern industrial lifestyle has on the maritime ecosystem and biodiversity (SDG 14), using as mediums both the arts and the cultural history of coral harvesting and processing in the islands.

When sustainable development promotes livelihood security, it enhances the adaptive capacities of vulnerable communities and households. In **West Bengal**, **Cultural Skills for Livelihood Resilience** promotes the cultivation of Shola reeds and the fine craft tradition of making Sholapith products, a livelihood the supports village

25 Id., Cultural Rights Report, §64 ('The exercise of cultural rights in accordance with international standards is necessary to achieve such resilience in the face of climate change vulnerabilities').

women (SDG 5) and is resistant to disruption by cyclone, and growing soil salinity. Regarding adaptation to protect human health more broadly, several culture-based adaptation case studies reported addressing mental health aspects of well-being (SDG 3.4), including through recreation and the enjoyment of landscapes (**Community Wetlands Forum**), and good health through stress reduction (**Gullah/Geechee Living Resiliency**), synergies that are often overlooked.

In multiple cases (for example discussions of ecosystem- and community- based adaptation), the IPCC found that synergies with the SDGs hinged on whether the adaptation measurers were 'inclusive of indigenous and local knowledge'. This focus is a recurring theme in the IPCC Sustainable Development Chapter. It is noteworthy, however, that the IPCC does not link traditional knowledge to culture or heritage. This treatment finds an echo in the Paris Agreement, which calls for adaptation to be guided by 'traditional knowledge' and 'knowledge of indigenous peoples and local knowledge systems' without mentioning culture or heritage.

The ostensible failure of the IPCC Sustainable Development Chapter to connect traditional knowledge and local knowledge systems with culture and heritage in general, and with cultural enabling conditions for climate resilience sustainable development in particular, is worth examining. Indigenous Peoples and local communities, their diverse knowledge systems, and their cultural heritage are not co-defined.[26] Indigenous Peoples and local communities are vital contemporary communities.[27] At the same time, the contemporary knowledge of environments, land use, and resource stewardship of Indigenous Peoples and local communities is generally understood, at least by culture advocates, as being an element of culture and heritage given its development over generations and close connections to surrounding environments.[28]

Divorcing traditional knowledge from its cultural and historic contexts has consequences for CRDP. In 2016, Ford *et al*,[29] found that the historical and contextual complexity of Indigenous experiences were largely overlooked in the Working Group II Contribution to the IPCC's Fifth Assessment Report.[30] The resulting de-politicization, they said, directed attention away from the underlying root causes of vulnerability, constraining the potential for linking adaptation to broader policy goals or decolonizing processes. Climate change response 'thus becomes a function of techno-managerial

26 Proposal for a Co-Sponsored International Expert Meeting on Cultural Heritage and Climate Change [Submission of ICOMOS and UNESCO to the IPCC]. [Rockman, M., et al, (eds.)]. 17 March 2020.

27 Nakashima, D. J., K. Galloway McLean, H. D. Thulstrup, A. Ramos Castillo, and J. T. Rubis, 2012: Weathering Uncertainty: Traditional Knowledge for Climate Change Assessment and Adaptation. UNESCO and United Nations University. See United Cities and Local Governments, 'Culture 21: Actions – commitments on the Role of Culture in Sustainable Cities,' approved by the Committee on Culture of United Cities and Local Governments at its first Culture Summit (Bilbao, 18–20 March 2015) ('the dialogue between 'tradition' and 'modernity', often compromised by a reactionary tendency to isolate and entrench traditions, could be improved if the exchange between them was more dynamic.').

28 Proposal for a Co-Sponsored International Expert Meeting.

29 Ford, J. D., L. Cameron, J. Rubis, M. Maillet, D. Nakashima, A. C. Willox, and T. Pearce, 2016: Including Indigenous knowledge and experience in IPCC assessment reports. Nature Climate Change, 6, 349-353.

30 IPCC, 2014: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., et al, (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp.

planning, in which traditional knowledge is 'integrated' into risk mitigation programs, but where existing power structures, inequalities and histories go unchallenged'.[31] The development of culturally relevant and appropriate adaptation policies, they concluded, required a more robust, nuanced, and appropriate inclusion and framing of Indigenous issues.

The 2019 IPCC Sustainable Development Chapter does broadly acknowledge that choices between possible adaptation pathways are shaped by uneven power structures and historical legacies. What is lacking is a joining up of these findings to a discussion of the cultural systems in which discrete elements of traditional knowledge exist or of the enabling conditions for sustaining the communities that carry this knowledge. Put another way, what is lacking is an understanding of the ways that promoting culture and safeguarding heritage are fundamental ecosystem- and community-based adaptation. The particular role of women in carrying local knowledge and the hindrance to the ability of women to contribute to climate change mitigation and adaptation by gender inequality and gendered power dynamics presents yet another cultural dimension.[32]

In **Hawai´i**, the **Revitalization of Indigenous Aquaculture** case study seeks to adapt the cultural practice of managing Loko i´a (Hawaiian fishponds), once an abundant source of protein, to sea level rise and a changing environment. The project has identified synergies with food security, livelihoods and the functioning of watersheds and estuaries (SDG14). These outcomes are consistent with the IPCC Sustainable Development Chapter which found that, in the area of food systems adaptation, the most direct synergy is with SDG 2 (zero hunger), with contributions also to safe drinking water, health, biodiversity and equity goals.

The Hawai´i project, however, also pointed out that Loko i´a were just one piece of a complex social and political system. They were components of a biocultural landscape that were revered as indicators of abundant lands and communities. The project sponsors stress maintaining the holistic spiritual and relational foundations of fishpond management as key to the perpetuation of this knowledge. This approach, they noted, provides additional support for resilience by restoring the reciprocal relationship to land and ocean resources, increasing community cohesion and relationship-building. These co-benefits are largely overlooked in the IPCC Sustainable Development Chapter.

Adaptation strategies can also result in trade-offs with and among the SDGs. Strategies that advance one SDG may create negative consequences for other SDGs.[33] The **Gullah/Geechee Living Resiliency**, for example, reported tension between

31 Id.
32 Cultural Rights Report, §75 (and sources cited therein).
33 Without explicitly saying so, the IPCC Sustainable Development Chapter provides an example from the cultural context; 'Adaptation pathways in the Bolivian Altiplano have transformed subsistence farmers into world-leading quinoa producers, but loss of social cohesion and traditional values, dispossession and loss of ecosystem services now constitute undesirable trade-offs.' IPCC Sustainable Development Chapter at 458 (citing Chelleri et al., 2016).

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"More than a 100 green cultural dreams". A serious game for the participative elaboration of cross-sectorial ecoloigical actions plans in and with culture!

efforts to safeguard local knowledge and exploitation of **St Helena Island** for tourism development. In Amsterdam, the use of water heritage for adaptation through the **Protection and continued functionality of historical sluices and gates** is under pressure from competing demands for the land occupied by dikes.

1.2. Adaptation Pathways towards a 1.5°C Warmer World and Implications for Inequalities

As the world continues to warm, adaptation projects must address place-specific warming experiences at 1.5°C. Evidence shows, the IPCC said, that choices between possible pathways in a 1.5°C world are shaped by uneven power structures and historical legacies that create their own, often unforeseen change. In this context, the IPCC said, place-specific adaptation pathways have the potential for significant positive outcomes when they (i) ensure a diversity of adaptation options based on people's values and the trade-offs they consider acceptable, (ii) maximize synergies with sustainable development through inclusive, participatory and deliberative processes, and (iii) facilitate equitable transformation.[34]

34 IPCC Sustainable Development Chapter, 457.

Around the Rwenzori Mountains National Park in **Uganda**, the **Melting Snow and Rivers in Flood** initiative utilises traditional knowledge of Uganda's ethnic groups to enhance reforestation of cleared land that is worsening flood impacts. This project, which expressly roots the sustainable management of a mountain and river ecosystems in the values of local communities, found synergies similar to other such efforts (e.g. mitigating the impacts of flooding) but also stressed the importance of preserving cultural identity and the use of cultural rights approaches for understanding the threats posed by climate change.

Transformational adaptation, the IPCC said, would require development that takes into consideration poverty and entrenched inequalities, as well as 'local cultural specificities and local knowledge in decision-making'.[35] A narrow view of adaptation decision-making, for example focused on technical solutions, tends to crowd out more participatory processes, obscures contested values and reinforces power asymmetries.[36] A context-specific understanding of adaptation pathways that galvanizes diverse knowledge and values can counteract these tendencies.

The **California Cultural Resources Task Force** reported that culture-based strategies used to increase community involvement, eliciting community members' values and desires, had the capacity to create more lasting outcomes. In **Taichung**, consensus was built for adapting sustainable practices for water management by drawing on local cultural heritage values. In **San Antonio**, before implementing adaptation strategies, the city applies a **Climate Equity Screening Tool** in order to ensure equal opportunities and reduce inequalities (SDG 10.3). Among other themes, the tool examines a proposed strategy's treatment of the culture, historic resources, and traditions of underserved and vulnerable communities as a means of considering inequality.

35 Id.
36 Id. at 459.

2. Mitigation and Sustainable Development

Mitigation refers to human interventions to reduce emissions of the Greenhouse Gases (GHGs) that are causing climate change, or to enhance the sinks of GHGs. The Paris Agreement reaffirms the goal of pursuing efforts to limit the increase in global temperatures to 1.5 degrees Celsius (Article 2) over pre-industrial levels; reaching net zero GHG emissions in the second half of the century; and conserving and enhancing sinks and reservoirs of GHGs, including forests (Article 5).

Unequivocal scientific evidence shows that unprecedented concentrations of greenhouse gases (GHGs), driven by human activities such as burning of fossil fuels and deforestation, have changed the earth's climate, including warming of the oceans and atmosphere, rising sea levels, retreat of glaciers and diminished snow.[37] Climate scientists have reaffirmed that there is a near-linear relationship between cumulative anthropogenic CO2 emissions and the global warming they cause.[38] Many changes in the climate system become larger in direct relation to increasing global warming, including increases in the frequency and intensity of hot extremes, marine heatwaves, and heavy precipitation, agricultural and ecological droughts in some regions, and proportion of intense tropical cyclones, as well as reductions in arctic sea ice, snow cover and permafrost.[39]

The Paris Agreement aims to hold the increase in the global average temperature to well below 2°C above pre-industrial levels while pursuing efforts to limit the temperature increase to 1.5°C. CO2 emissions reductions that limit global warming to 1.5°C (with no or limited temperature overshoot) can involve different combinations of mitigation measures, striking different balances between lowering energy and resource intensity, rate of decarbonization (e.g. transition to green power), and reliance on CO2 removal (CDR) measurers.[40] In order to have a reasonable chance of holding global warming to 1.5°C, global net anthropogenic CO2 emissions need to decline by about 45% from 2010 levels by 2030, reaching net zero around 2050.[41] Accomplishing this requires rapid and far-reaching transitions in energy, land, urban and infrastructure, and industrial systems, including urban planning, transport and buildings.[42]

37 2021 WG I Contribution (Finding that atmospheric CO2 concentrations were higher than at any time in at least 2 million years).
38 Id. (Finding that each 1000 GtCO2 of cumulative CO2 emissions is assessed to likely cause a 0.27°C to 0.63°C increase in global surface temperature with a best estimate of 0.45°C41.).
39 2021 WG I Contribution.
40 IPCC, 2018: Summary for Policymakers. In: Special Report on 1.5°C. In Press. [Hereinafter, 'IPCC 1.5°C Summary for Policymakers'].
41 Id.
42 Id.

Culture and heritage intersect both directly and indirectly with climate change mitigation and achieving the Paris Agreement's temperature goal. Through creativity, inspiration, education and knowledge, and by building cohesive and inclusive communities, culture and heritage drive and enable mitigation ambitions among people. Culture influences our understanding of the environment and our relationship with it on a deep level. Cultural heritage practice can support sustainable consumption and production patterns by framing circular economy models in terms of reuse, stewardship and inter-generational equity; by centring non-material dimensions of well-being; and by emphasising integrated nature-culture approaches that promote lifestyles in harmony with nature.[43] Changes to underlying social and cultural norms are more difficult to accomplish than transitory behavioural changes, but once established they are likely to be more durable and to support a wider range of low-carbon lifestyles.[44]

In terms of demand-side energy measures to reduce GHGs, attention to 'embodied carbon', for example by promoting the use and adaptive reuse of existing buildings and materials helps to decarbonise the built environment, as does reducing the energy needed to operate the existing built environment (so-called 'operational carbon'). In other sectors like agriculture and land use, learning from time-tested low-carbon technologies and techniques, diets and habits, and land-use patterns suited to local environments can accelerate mitigation. Monitoring, measuring and equitably reducing the GHGs emission from aviation, hospitality and other contributing service components of cultural tourism is also relevant. Culture and heritage institutions and offerings including libraries, museums, festivals, concerts and heritage sites can green their own operations. Artists and designers provide ingenuity and innovation in material, social, cultural and economic ways that embrace environmental values, drive the circular economy, and trial new, values-led business models.[45]

On the supply-side, prioritising learning from traditional knowledge about renewal energy production (e.g., geothermal) supports community-based transition to renewable energy. Fostering a willingness to accommodate appropriate renewable energy installations and projects in and around heritage resources while proactively mediating conflicts between the siting of these installations and heritage conservation supports a green transition in the energy sector, as does electrification and other supply side 'switching' strategies for older and historic buildings.

43 Andrew Potts, 'An Urgent Journey: Realizing the Potential of Integrated Nature–Culture Approaches to Create a Sustainable World,' The George Wright Forum, vol. 34, no. 2, pp. 229–237 (2017). **www.georgewright.org/342potts.pdf**; Mālama Honua—To Care for Our Island Earth: A Statement of Commitments from the Nature–Culture Journey Participants at the IUCN World Conservation Congress, Hawai'i 2016. Online at **www.iucn.org/files/m%C4%81lama-honua-%E2%80%93-statement-commitments-nature-culture-journey**.

44 Bridging the gap – the role of equitable low-carbon lifestyles, Capstick, S. et al. In: UNEP (2020). The Emissions Gap Report 2018. United Nations Environment Programme, Nairobi. 75.

45 7 Trends: A Creative Climate Movement (London: Julie's Bicycle).

2.1. Synergies and Trade-Offs between Mitigation Options and Sustainable Development

The IPCC Sustainable Development Chapter found that mitigation options consistent with 1.5°C pathways lead to multiple synergies across a range of SDGs. At the same time, the rapid pace and magnitude of change that would be required to limit warming to 1.5°C, if not carefully managed, would lead to trade-offs with some sustainable development dimensions. This differs from the adaptation context where the IPCC found less risk of trade-offs. Understanding these synergies and trade-offs is key for selecting mitigation options and policy choices that maximize the synergies between mitigation and developmental actions. Aligning mitigation response options to sustainable development objectives, the IPCC said, can ensure public acceptance, encourage faster action and support the design of equitable mitigation that also protect human rights.[46]

According to the IPCC, mitigation actions designed to reduce energy show the most pronounced synergies and the lowest number of trade-offs with respect to the SDGs. Most such interactions are of a reinforcing nature, hence facilitating the achievement of sustainability goals. This synergy is evident in the context of heritage safeguarding, as energy efficiency reduces the need for energy infrastructure and installations (e.g., transmission corridors) with correspondingly less impact on biodiversity and cultural resources.[47] Arts, culture and heritage support demand-side energy reduction, energy efficiency and resource efficiency/circular economy in a variety of ways and across multiple sectors. As with demand-side reduction approaches in general, these efforts have synergies with a large number of SDGs.

In the buildings sector, cultural heritage-based resource efficiency strategies promote an ethic of stewardship that emphasis the continued use and adaptive reuse of existing buildings, thereby conserving embodied carbon and avoiding the GHG emissions associated with new construction. **Benny Farm**, a social housing project in **Montreal**, Canada, illustrates the intersection of resource efficiency and local values, memory and inclusive cultural processes. The 18-hectare project was slated to be demolished until the application of a heritage conservation lens developed through a participatory design process resulted in reuse of the original buildings (SDG 12), preservation of affordability and green public spaces (SDG 11) and new district geothermal heating system managed by a community-run utility company (SDG 7).

46 IPCC Sustainable Development Chapter, 460. See Culture Rights Report, §20 ('Both the protection of human rights, including cultural rights, and of the environment are 'indispensable for sustainable development'')(citing Office of the High Commissioner for Human Rights (OHCHR) and UNEP, 'Human rights and the environment: Rio+20: joint report OHCHR and UNEP' (2012), background document for OHCHR-UNEP joint side event on 'human rights at the centre of sustainable development – honouring Rio Principle 1', at the United Nations Conference on Sustainable Development, Rio de Janeiro, 2012, p. 6.); §19 ('The work of cultural rights defenders, human rights defenders who defend cultural rights in accordance with international standards, is a sine qua non for … developing and advancing the use of cultural rights and cultural initiatives to combat [climate change]').

47 Potts, A (Lead Author). 2021. European Cultural Heritage Green Paper. Europa Nostra, The Hague & Brussels. [Hereinafter, 'Green Paper'].

Traditional knowledge concepts which play a key role in the adaptation section of the IPCC Sustainable Development Chapter disappear in the mitigation context in favour of 'innovations and deployment of new technologies'.[48] Traditional knowledge, or so-called 'endogenous capacities' also play a role in mitigation, however. In **Benin**, the project **Otammari, green architecture** promotes traditional knowledge of earthen construction as contemporary climate technology. Local materials including earth, cow dung and organic materials like raffia and millet stem take the place of GHG intensive cement (SDG 9), reduce operational carbon and improve comfort (SDG 7), while also honouring cultural and spiritual practices (SDG 11).

The IPCC Sustainable Development Chapter notes that energy efficiency also supports the creation of decent jobs by companies providing services for energy efficiency. In **San Antonio**, the project **San Antonio Trades Education: A Path to Workforce Development and Affordable Housing** places students in apprenticeships with master craftsmen to assure a well-stocked pool of trained traditional trade practitioners. This provides skill jobs (SDG 8), makes the reuse and retrofitting of existing buildings less challenging and more affordable (SDG 12), and safeguards local heritage, community identity, and sense of place (SDG 11).

Accelerating operational efficiency in the buildings sector by retrofitting and low- or zero-energy buildings generates benefits across multiple SDG targets. In **France**, **CREBA (resource centre for the energy rehabilitation of ancient buildings)** promotes the retrofitting of older buildings for energy efficiency and comfort in ways that preserve the historic urban landscape and the testimony it bears to traditional ways of life and techniques. CREBA pays special attention to addressing real and perceived trade-offs between energy efficiency and the loss of culture values carried on the built environment that can result from standardized (or maladapted) approaches to retrofitting.

Climate resilient development pathways in the transport sector implicate the cultural and creative aspects of mobility. Cultural strategies can support changes in user behaviour towards increased physical activity, less reliance on motorized travel over short distances and the use of public transport, which helps to decarbonize the transport sector in a synergetic manner with SDGs 3, 11 and 12, while reducing inequality, including in access to cultural activities such as festivals, fairs, natural and cultural heritage sites and practices (SDG 10).[49]

Governments can support compact, connected low-carbon cities and show synergies with sustainable cities (SDG 11) by protecting areas with dense, walkable mixed-use traditional land use patterns. Projects in **Izmir**, Turkey (**Rehabilitation of 848th Street**) and **Karachi**, Pakistan (**Denso Hall Rahguzar (Walking Street**) Eco Enclave) illustrate

48 IPCC Sustainable Development Chapter, 474.
49 A collection of good practices is available at: **www.creative-mobilities.org**. 'Creative Mobilities' was launched in 2017 in Grenoble (France) as an international platform of experts and practitioners fostering synergies between culture and mobility policies and actors for sustainable urban and territorial development.

how targeting water, sewer, transport and other infrastructure upgrades (SDG 9) and improvements to city services to dense historic neighbourhoods promote continued use, thereby avoiding GHG emissions associated with new construction, reducing operating carbon, and supporting walkability, all while promoting community culture and heritage and improving quality of life, health, and environmental outcomes (SDG 1, 3, 6, 10).

Insertion of new mass transit infrastructure can risk loss of cultural values and public spaces. The project **Citizen participation to achieve sustainable mobility in the Historic Centre of Quito** used participatory processes emphasising heritage and identity to help design a new zero carbon intermodal network and public spaces for Quito's historic centre, a UNESCO World Heritage site. **València**, Spain's **Tourism sustainability strategy** seeks to reduce the carbon and water footprints of the city's more than 2.5 million annual visitors, many drawn by cultural attractions but addressing the trade-offs presented by tourism habits 'may not always be easy, financially affordable, nor immediate'.

Behavioural responses, the IPCC Sustainable Development Chapter states, are important determinants of the ultimate outcome of energy efficiency on emission reductions and energy access (SDG 7) and their management requires a detailed understanding of the drivers of consumption. Culture and heritage provide context to user preferences and behaviours. The **New European Bauhaus**[50] initiative aims to mobilise designers, creative minds and others to reimagine sustainable living, acting as a bridge between the worlds of science and technology and art and culture. It strives to support the aims of European Green Deal by highlighting the value of simplicity, functionality, and circularity of materials without compromising comfort and attractiveness, promoting mitigation while improving quality of life.

2.2. Energy Supply: Accelerated Decarbonization

Fast deployment of renewables such as solar, wind, hydro and modern biomass, together with the decrease of fossil fuels in energy supply, is aligned with the doubling of renewables in the global energy mix (SDG 7.2). However, some trade-offs with the SDGs can emerge, including the safeguarding of natural and cultural heritage (SDG 11.4, 15). Holistic planning approaches and improved impact assessment methodologies (SDG 17) and enhanced institutional capacity, including for cultural safeguarding bodies (SDG 16), can reduce trade-offs and promote co-benefits.[51]

50 European Commission, 'Bauhaus EU Factsheet EN,' 14 October 2020. **https://ec.europa.eu/commission/presscorner/api/files/attachment/866593/Bauhaus%20EU%20factsheet%20EN.pdf.pdf.**
51 Green Paper.

The deployment of small-scale renewables has strong potential for synergies with access to energy (SDG 7). At the iconic **Penrhyn Castle, a Norman castle rebuilt in the 1820s** in **Wales**, a demonstration project that removed seven oil heating boilers and implemented a locally-sourced biomass fuel heating system, on-site solar, and heat recovery from waste-water, has inspired and enabled other community energy development.

Low-income populations in industrialized countries are often left out of renewable energy generation schemes, either because of high start-up costs or lack of home ownership.[52] For example, converting from wood fired cooking to solar energy reduces considerably both the emissions generated by cooking and desertification and deforestation (SDG 15). Cooking on open fire results in lung diseases, which can be avoided by cooking with electricity (SDG 3). Women in charge of collecting wood can devote their time to other activities (SDG 5). Across **Africa**, **Sun Generator - Affordable & Clean Electricity for All** aims to achieve these outcomes through 'open source' solar technology, framed in terms of supporting local communities and Indigenous Peoples to continue traditional lifeways but in a more sustainable fashion.

In the agriculture, forestry and other land use (AFOLU) sector, dietary change towards global healthy diets, that is, a shift from over-consumption of animal-related to plant-related diets, and food waste reduction are in synergy with SDGs 2 and 6, and SDG 3 through lower consumption of animal products and reduced losses and waste throughout the food system, contributing to achieving SDGs 12 and 15. Incorporating the health benefits of traditional diets would advance these goals while enhancing the cultural identity and continuity.[53] In **Johannesburg**, South Africa, the **Community Recycling Swop Shop Makers Valley Partnership** uses education to reduce food waste (SDG 12) and feed communities (SDG 2), while working with local 'makers' and 'creatives' to reuse diverted waste it in innovative ways like making eco-bricks and craft items for sale (SDG 8).

Approaches that marrying circular economy models with traditional land, water, agricultural, and forest management systems to support sustainable fishing, agriculture, and rural development have the potential to increase economic benefits by creating decent jobs (SDG 8), maintaining biodiversity (SDG 15), and encouraging responsible and just decision-making (SDG 16), while recognising traditional knowledge as innovation and upgrading technology (SDG 9). These results are supported by cultural frameworks that lead to co-management and long-term stewardship of lands by Indian tribes (**California Cultural Heritage and Climate Action Integration Analysis**), or land tenure by Indigenous Peoples.[54]

52 Policy Innovations for Transformative Change: Implementing the 2030 Agenda for Sustainable Development. United Nations Research Institute for Social Development (UNRISD), Geneva, Switzerland, 248 pp.

53 Id.(citing the Mediterranean Diet which in 2013 was inscribed on the UNESCO Representative List of the Intangible Cultural Heritage of Humanity and which represents both a healthy dietary pattern and a sustainable one, promoting sustainable agriculture and protecting traditional landscapes.)

54 IPCC Sustainable Development Chapter. The Special Rapporteur on the Rights of Indigenous Peoples has warned that mitigation and adaptation measures undertaken in response to climate change without the free, prior and informed consent of affected Indigenous Peoples or without their participation, may further undermine their cultural rights. United Nations, General Assembly, 'Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development: Report of the Special Rapporteur on the Rights of Indigenous Peoples,' A/HRC/36/46 (1 Nov 2017), available from **https://undocs.org/en/A/HRC/36/46**. This may, in particular, create obstacles for indigenous land ownership, Id., and livelihood rights. Culture Rights Report, supra, §55.

2.3. Sustainable Development Implications of 1.5°C and 2°C Mitigation Pathways

The IPCC Sustainable Development Chapter concludes that the design of the mitigation portfolios and policy instruments to limit warming to 1.5°C will largely determine the overall synergies and trade-offs between mitigation and sustainable development. Redistributive policies that shield the poor and vulnerable can resolve trade-offs for a range of SDGs. Individual mitigation options are associated with both positive and negative interactions with the SDGs.

Integration of mitigation with adaptation and sustainable development compatible with 1.5°C warming, implemented in a participatory manner, can enable rapid, systemic transitions in urban and rural areas,[55] but such approaches require a systems perspective.[56] These are most effective when aligned with economic and sustainable development. The **Granton Gasworks Railway Station** in **Edinburgh** required multi-disciplined partnership to balance the demands of developing a modern, flexible multi-let business space and public realm, with mitigation measures like car-free development, reusing existing buildings and improving energy efficiency, together with adaptation measurers aimed at sustainable drainage, ecology and landscapes, while preserving heritage values.

The IPCC has said that all pathways that limit global warming to 1.5°C with limited or no temperature overshoot project the use of carbon dioxide removal (CDR). CDR would be used to compensate for residual emissions and, in most cases, achieve net negative emissions to return global warming to 1.5°C following a peak. Existing and potential CDR measures include afforestation and reforestation, land restoration and soil carbon sequestration, and BECCS. These differ widely in terms of maturity, potentials, costs, risks, co-benefits and trade-offs. Emerging evidence indicates that CDR efforts may also impose significant constraints upon poor and vulnerable communities (SDG 1) via increased food prices and competition for arable land, land appropriation and dispossession with disproportionate negative impacts upon rural poor and indigenous populations.

These negative impacts can extend to cultural heritage[57] and cultural rights.[58] In general, CDR approaches that increase carbon sequestration in natural systems and that have other benefits which together outweigh the costs, should be prioritised provided they adhere to strict environmental and social safeguards, including safeguarding of heritage values, and consider storage permanence – i.e. they have benefits for nature, people and climate.[59] **Restoring St Helena's Internationally**

55 IPCC 1.5°C Summary for Policymakers.
56 IPCC Sustainable Development Chapter.
57 Future of Our Pasts, 52-53.
58 Culture Rights Report, §57.
59 Future of Our Pasts, 52.

important cloud forest for water security and wildlife seeks to enhance the forest's carbon sequestration, while supporting business activities like tourism, forestry and farming that contribute to, and benefit from, the natural wealth of the National Park and raising awareness among community and a wider public to the ecological and cultural value of St Helena's cloud forest, and the need to preserve it.

The **Community Wetlands Forum** in **Ireland** work toward the restoration of wetlands, which creates carbon sinks to reduce CO2 emissions, encouraging transition from turf cutting and peat extraction towards more sustainable forms of employment. Farmers and people living in peatland communities have cultural and property rights to cut turf from the bog, which can clash with efforts to conserve some bog habitats. The CWF are partners with Irish Rural Link, the National Parks and Wildlife Service, and a new European Innovation Project called FarmPeat, to address these tensions and encourage solutions and positive actions that focus on the needs of local communities, famers and those who are impacted economically by conservation policies. The CWF have also started a project to work with communities on a 'Just Transition' to a low carbon future.

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Former Convent of La Divina Providencia, built in 1902 and refunctionalized in 1980 as Museo de Arte Contemporáneo Beato Angélico, Universidad Católica de La Plata, Argentina.

3. Planning for Loss and Damage

Loss and damage refer broadly to harm associated with the adverse effects of climate change, particularly where adaptation is no longer an option (i.e., where a system's/people's needs cannot be secured from intolerable risk through adaptive action). See Paris Agreement Article 8, which recognizes the importance of averting, minimizing and addressing loss and damage 'and the role of sustainable development in reducing the risk of loss and damage.'[60]

> *'[T]hose most affected by climate change – who have often done the least to contribute to it – have fewer resources to protect their cultures from its effects... We cannot be passive observers of cultural extinction.'*
>
> **— Karima Bennoune, UN Special Rapporteur in the field of Cultural Rights**[61]

There are limits to the capacity for human and natural systems to adapt to the impacts of climate change.[62] While most adaptation needs will be lower with global warming of 1.5°C compared to 2°C,[63] warming of 1.5°C is not considered 'safe' for most nations, communities, ecosystems and sectors, and poses significant risks to natural and human systems as compared to the current warming of 1°C.[64] Some impacts may be long-lasting or *irreversible*.[65] When the adaptive limits of systems are reached, loss and damage can result.[66] Loss and damage is associated with both rapid onset events (e.g. wild fires) and slow-onset events (e.g. changing seasonality, aridification).[67]

Correlations between culture and loss and damage are complex.[68] Cultural factors can constrain the ability of communities to adapt in the first place.[69] The interaction of these factors with climate change can lead to soft adaptation limits (adaptive actions currently not available) and hard adaptation limits (adaptive actions appear infeasible leading to unavoidable impacts). Culture also mediates recognition of loss

60 Paris Agreement, §8.1.
61 UN Human Rights, Office of the High Commissioner, European Commission, 'UN expert calls for urgent action to prevent climate change from leading to cultural extinction,' Geneva, 22 October 2020. **www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=26413&LangID=E.**
62 See IPCC 1.5°C Summary for Policymakers, §B.6.
63 IPCC 1.5°C Summary for Policymakers, §B.6.
64 IPCC Sustainable Development Chapter, 447.
65 IPCC 1.5°C Summary for Policymakers, §A.3.2.
66 See IPCC 1.5°C Summary for Policymakers, §B.6.
67 Cross-Chapter Box 12. Residual Risks, Limits to Adaptation and Loss and Damage, Lead Authors: Riyanti Djalante, R. et al, In: IPCC Sustainable Development Chapter [Hereinafter, 'Cross-Chapter Box 12], and sources cited therein. For a discussion of impacts of slow-onset versus rapid-onset events and their impacts on cultural heritage, see Future of Our Pasts, 66-67.
68 Future of Our Pasts, 59-62.
69 Table 1 in Cross-Chapter Box 12 sets out soft and hard adaptation limits in the context of 1.5°C and 2°C of global warming, noting for example that large-scale changes in oceanic systems inflict damage and losses to livelihoods and cultural identity for coastal-dependent communities at 1.5°C.

and damage, i.e. the thresholds at which the limits of adaptation are perceived to have been reached. These limits can be understood as points beyond which actors' objectives are compromised by intolerable risks threatening key objectives,[70] which may themselves be cultural in nature, such as continuity of cultural identities and worldviews.[71]

What constitutes losses and damages is context-dependent and often requires place-based understanding of what people value and consider worth protecting.[72] International policy distinguishes between economic (e.g. loss of assets and crops) and non-economic loss. Non-economic losses and damages ('NELD') include losses of life, health, cultural heritage, indigenous/local knowledge, biodiversity and ecosystem services.[73] Assessing non-material and intangible losses is particularly challenging.[74]

Conceptual and applied work, including from the culture and heritage context, has highlighted the synergies and differences with adaptation and disaster risk reduction policies (e.g. the Sendai Framework for Disaster Risk Reduction), suggesting more integration of existing mechanisms, yet careful consideration is advised for slow-onset events and potentially irreversible impacts and risk.[75] Scholarship on justice and equity has provided insight on compensatory, distributive and procedural equity considerations for policy and practice to address loss and damage,[76] including culture.[77] This extends to the governance of cultural heritage.[78]

The relationship between culture, loss and damage and sustainable development is iterative. Loss of Indigenous Peoples' knowledge and local knowledge-based practices and associated cultural heritage can limit both the ability to recognise and respond to risk — and the empowerment of local communities.[79] The development of methodological approaches to understand the cultural dimensions of non-economic loss and damage can advance understanding of the vulnerability of communities and clarify these dynamic and complex interactions.[80]

Millions will face multi-faceted challenges associated with climate change-related migration and displacement in the coming decades.[81] Human migration can be

70 Cross-Chapter Box 12.
71 See Cultural Rights, 50.
72 Cross-Chapter Box 12.
73 NELD is currently an action area under the UNFCCC's Warsaw Mechanism workplan. See **https://unfccc.int/process/bodies/constituted-bodies/WIMExCom/NELs**. See also Cross-Chapter Box 2, Key Concepts of Risk, Adaptation, Resilience and Transformation, Authors: Garschagen, M. et al., In: Abram, N., et al., 2019: Framing and Context of the Report. In: IPCC Special Report on the Ocean and Cryosphere ('The assessment encompasses non-economic losses, including the impacts on intrinsic and spiritual attributes with which high mountain societies value their landscapes (Section 2.3.5); the interconnected relationship with, and reliance upon, the land, water and ice for culture, livelihoods and wellbeing in the Arctic (Section 3.4.3.3); and cultural heritage and displacement').
74 Cross-Chapter Box 12; Future of Our Pasts, 60.
75 Cross-Chapter Box 12.
76 Id.
77 See, e.g., Torres Strait Islanders' Petition (UN Human Rights Committee) (2019) alleging that Australia is violating the plaintiffs' fundamental human rights under the International Covenant on Civil and Political Rights (ICCPR) due to the government's failure to address climate change citing, among other things, loss of culture and way of life; loss of life; damage to burial grounds and cultural sites; loss of territory; loss of marine life.
78 As noted in the Recommendations from the Scientific Council Symposium Cultural Heritage and Global Climate Change (GCC) held by the ICOMOS Scientific Council in Pretoria, South Africa on 7 October 2007.
79 Magnan, A.K. et al, 2019: Cross-Chapter Box 9: Integrative Cross-Chapter Box on Low-Lying Islands and Coasts. In: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate [H.-O. Pörtner et al. (eds.)].
80 Future of Our Pasts, 60.
81 Future of Our Pasts, 61.

understood as an adaptation strategy, but one which can be profoundly culturally disruptive, thus implicating loss and damage. The systemic nature of the problem points to the need to supplement individual resettlement and humanitarian actions with planning for the relocation/retreat of entire communities. Synergies between migration and the achievement of sustainable development depend on adaptive measures and conditions in both sending and receiving regions.[82] Cultural strategies can help conserve the knowledge and heritage values of displaced communities; play a role in planning effective resettlement strategies, including helping displaced communities create a sense of the familiar by maintaining familiar practices and social relationships; and aid with inclusion and integration with receiving communities.[83]

"Le Corbusier's painting studio - interior vault insulated from the outside." Le Corbusier Fondation.

82 IPCC Sustainable Development Chapter, 457.
83 Id.

4. Enabling Conditions and Heightening Ambition

Climate ambition refers to the collective will and means to achieve the objectives of climate action. Enabling conditions are the conditions that can accelerate and scale- up systemic transitions that would limit temperature increase to 1.5°C, while achieving sustainable development. Enabling conditions include finance, technological innovation, institutional capacity, multilevel governance, and changes in human behaviour and lifestyles. They also include inclusive processes, attention to power asymmetries and unequal opportunities for development and reconsideration of values. Key aspects of these concepts correlate to Articles 9, 10, 11 and 12 of the Paris Agreement.

The transformations in energy, land, urban, infrastructure and industrial systems needed to limit global warming to 1.5°C, reduce inequality, and alleviate poverty would 'require more planning and stronger institutions (including inclusive markets) than observed in the past, as well as stronger coordination and disruptive innovation across actors and scales of governance.'[84] In its introductory sections, the IPCC Chapter lists culture as a key enabling condition for achieving sustainable development in a 1.5°C warmer world,[85] especially linked to governance.[86] However, its narrative discussion never returns to the topic and the Chapter omits discussion of culture *per se* from the areas it addresses.

The first enabling condition the Chapter does discuss is finance and technology, finding that significant gaps in green investment have constrained climate resilient development pathways. It notes that conventional climate funding schemes have shown positive effects on sustainable development but also adverse consequences.[87] Embedding culture-based strategies and funding climate development projects that build on the craft, traditional knowledge, and other endogenous capacities of local communities help by better aligning design of financial support with community needs. Attention to culture as part of environmental integrity underwriting safeguards encourages co-benefits and minimises damage to cultural resources and other forms of maladaptation.

The development and transfer of technologies is another enabler discussed in the IPCC Chapter. Discussions, however, suffer from a preoccupation with new technologies

84 de Coninck, H., et al., 2018: Strengthening and Implementing the Global Response. In: Special Report on 1.5°C, 317. [Hereinafter, 'Strengthening and Implementing the Global Response.'].
85 IPCC Sustainable Development Chapter, 451. See also Allen, M.R., et al., 2018: Framing and Context. In: Special Report on 1.5°, 56 ('The feasibility of staying within 1.5°C depends upon a range of enabling conditions with geophysical, environmental–ecological, technological, economic, socio-cultural, and institutional dimensions.').
86 Id. at 475.
87 IPCC Sustainable Development Chapter, 474.

and with North-to-South transfer. The separation of traditional knowledge and craft skills from 'climate technology' obscures its full potential and disconnects it from the financing, support, and transfer mechanisms. The prevalence of place-adapted, low-carbon approaches in the Global South, coupled with regionally-shifting extreme weather phenomenon, highlight the need to support South-to-North (and South-South) technology transfer. The **Melting Snow and Rivers in Flood project**, for example, promotes two-way exchange between cultural organisation in **Uganda** and the **UK** on natural flood management.

Inclusive governance processes are also identified in the Chapter as being critical for preparing for a 1.5°C warmer world.[88] Pathways compatible with 1.5°C warming entail processes of deliberation and implementation that address societal values, local priorities, and inevitable trade-offs. The transversal integration of culture into governance supports the iterative engagement of diverse populations, drawing on the shared nature of culture and its central place in the construction of public spaces. Culture and heritage methodologies support people-centred approaches and illuminate the varied stakeholders involved and their values.[89]

Active participation in cultural life provides the motivation and possibility of increased civic participation, lends cultural visibility to marginalised groups, and fosters mutual recognition and cooperation between different generations and cultures. Culture and heritage institutions can also serve as platforms for listening to communities and providing open opportunities to inspire voluntary participation in advocacy and collective climate action. These processes support inclusive governance by serving the interests of diverse groups of people, enhancing empowerment, and providing opportunities to blend indigenous, local and scientific knowledge. In this context, measures should take into account the contribution of women in decision-making, since women are disproportionately affected by climate change, tend to have lower access to resources and yet play a vital role in achieving inclusive sustainable development.

Under the heading 'Reconsidering Values,' the IPCC Sustainable Development Chapter states that 'the profound transformations that would be needed to integrate sustainable development and 1.5°C-compatible pathways call for examining the values, ethics, attitudes and behaviours that underpin societies'.[90] This includes overcoming individual economic interests and going beyond economic growth. This entails helping societies and individuals to strive for sufficiency in resource consumption within planetary boundaries alongside sustainable and equitable well-being.

Indigenous Peoples' resources governance systems have been proven to generate and sustain biological and landscape diversity.[91] Many traditional knowledge studies have framed indigenous peoples as stakeholders and have not treated traditional knowledge

88 Id. at 475.
89 Cf. Strengthening and Implementing the Global Response, 322.
90 IPCC Sustainable Development Chapter, 475.
91 See ICCA Consortium. 2021. Territories of Life: 2021 Report. ICCA Consortium: worldwide. Available at: report. **https://report.territoriesoflife.org/**

as a governed, sovereign property. Governance rights over traditional knowledge are not separable from governance rights over the biocultural heritage to which they are associated.[92] Pre-modern governance systems of other local communities can also provide a model for long-term sustainability. All economic models are based on specific cultural values and choices. Cultural heritage safeguarding aligns with circular economy approaches including a focus on multi-generational time scales and horizons; integrating an ethic of stewardship, reuse and conservation. The **Slow Food Prud'homie**, for example, is a culturally engrained local governance system, evolved from medieval trade guilds that have been managing French marine resources for over ten centuries, in which local fishermen come together to jointly manage the resources of the sea in a sustainable way.

The foregoing discussion explores the cultural dimensions of the enabling conditions that are emphasised in the IPCC Sustainable Development Chapter. However, the absence of a categorical treatment of culture results in the role of concepts like imagination, inspiration, creativity, memory, belonging and identity, *as enabling conditions*, being missed. Cultural heritage, creative industries, and craft are well-placed to engage with the wider community on the changes needed for a successful transition to a low carbon, climate resilient future.

Human Settlements Role to mitigate Climate Change

92 Williams, T., Hardison, P. Culture, law, risk and governance: contexts of traditional knowledge in climate change adaptation. Climatic Change 120, 531–544 (2013). **https://doi.org/10.1007/s10584-013-0850-0**

5. Climate Justice and Just Transition

Climate Justice can include solidarity with Indigenous Peoples and communities on the frontlines of climate impacts; participatory climate governance; gender-responsive climate action; and human rights and rights-based approaches to climate action. Just Transition can include alleviating the economic and social costs of the transition towards a climate neutral economy with a focus on the workers, industries and regions facing serious socio-economic challenges.

The IPCC Sustainable Development Chapter affirms that social justice and equity are core aspects of climate-resilient development pathways for transformational social change.[93] Attention to equity requires recognising the uneven development status between richer and poorer nations, the uneven distribution of climate impacts (including on future generations), and the uneven capacity of different groups to respond to climate risks.[94] This is particularly true for those who are highly vulnerable to climate change, such as Indigenous Peoples whose livelihoods depend on agriculture or coastal and marine ecosystems, and inhabitants of small island developing states.[95] Many poor and marginalized groups lack the basic capacities to adapt even to current levels of warming.[96]

Anthropogenic climate change has largely been caused by the cumulative greenhouse gas emissions of industrialized countries over centuries, but its impacts are affecting all the peoples of the world. The disparities between those most responsible for causing climate change and those most vulnerable to its impacts are enormous.[97] The wealthiest 1% of the world's population are responsible for twice the emissions of the poorest half. Their carbon footprints are more than 100 times larger, matching their greater consumption, wealth, and political influence.[98]

Cultural consideration impact how widely capabilities are distributed within a society; gender roles; societal tolerance or rejection of unequal harms; social roles in resource use, sharing and management; and political and economic relations and legal institutions. In the face of cultural extinction from climate impacts, cultural rights are an integral element of human rights,[99] guaranteeing the ability to identify with one or several cultural communities, active participation in cultural life, and access to the knowledge necessary to exercise other rights, freedoms, and responsibilities. The building of common causes across social movements and intersectional interests, linking climate justice with gender justice and racial justice, and defending Indigenous

93 IPCC Sustainable Development Chapter, 448.
94 Id. at 479.
95 Id.
96 Three Decades of Climate Mitigation, 671.
97 Id.
98 Id.
99 See generally, Culture Rights Report.

Peoples' communities, land tenure and cultural rights,[100] supports imagining alternative climate futures.[101]

The potential for pursuing sustainable and climate-resilient development pathways towards a 1.5°C warmer world differs between and within nations, due to differential development achievements and trajectories, and opportunities and challenges. The concentration of exposure to climate harm on low-income people, people of colour, and indigenous people, is contrasted with the ability of those who are wealthy and more closely connected to government and corporate power to avoid costs, while appropriating benefits. The prospect of powerful and affluent groups opting for personal protections, rather than joint responses that secure communal benefit, raises concerns about exclusive adaptation that protect the privileged at the cost of those who are most vulnerable.[102]

Infusing values that overcome individual economic interests and go beyond economic growth and encourage care for the 'less fortunate' is part and parcel of climate-resilient and sustainable development pathways.[103] Transformation entails building solidarity and alliances. Solidarity principles need a unified vision between all local actors whereby each one's responsibilities is structured via multi-governance mechanisms.[104] This solidarity must be a two-way process with all participants learning from each other's experiences. South-South cooperation should be supported. Some cultural models emphasise the importance of heritage and education as factor for peace, in inter-personal and inter-cultural dialogue and by promoting mutual understanding and conflict-prevention.[105]

Climate change is 'the most significant intergenerational equity issue of our time. Children and future generations are bearing, or will come to bear, the brunt of its impact on a polluted, degraded planet'.[106] The destruction of culture is a fundamental breach of the principle of intergenerational equity, in that a culture destroyed or diminished within the time of the current generation will deprive members of future generations of their right to their cultural inheritance.[107]

Economies dependent upon fossil fuel-based energy generation and 'hard to abate' energy intensive industries are expected to be disproportionally affected by future restrictions on the use of fossil fuels under stringent climate goals and higher carbon prices. This raises the issue of 'just transition.' The IPCC Sustainable Development Chapter states that fairness suggests the need for decarbonization and up-scaled adaptation to 'address values and beliefs' while not exacerbating social injustices, upholding human rights,

100 See generally The United Nations General Assembly. (2007). Declaration on the Rights of Indigenous People.
101 Three Decades of Climate Mitigation.
102 Id.
103 IPCC Sustainable Development Chapter, 475.
104 United Cities and Local Governments, Manifesto Ecology for Future, Our Commitment in Helping Shape the Redefinition of the Ecological Transition (2019).
105 See, e.g. Council of Europe (CoE). Council of Europe Framework Convention on the Value of Cultural Heritage for Society. In Faro Declaration of the Council of Europe's Strategy for Developing Intercultural Dialogue; 2005; Available online: **https://rm.coe.int/1680083746.**
106 Cultural rights, §9.
107 International National Trust Organisation, The Victoria Declaration on the Implications for Cultural Sustainability of Climate Change (2011).

and being 'socially desirable and acceptable'.[108] This calls for just transition policies and measures that ease job losses and correct for relatively higher prices of energy but also address cultural disruption, all of which suggests rooting just transition initiatives in the culture, heritage, creative industries, craft, and knowledge of local communities.

Grounding dialogue in local cultural knowledge and tradition can help authorities to listen to and learn from communities, rather than only aiming to 'transform' them.[109] Cultural heritage operators can help encourage local co-creation of transition planning by supporting community-based prioritisation and documentation of the effects of structural changes, for example by taking account of impacts on losses of traditional livelihoods and other elements of cultural significance. Memorialising the historic contributions of affected regions, workers, and trades to the Anthropocene can also facilitate moving beyond them as part of transition to a post-carbon economy. Craft heritage and traditional livelihoods can support contemporary re-skilling and economic diversification for job creation and enhanced resilience.

In Ireland, peatlands function as bio-cultural landscapes, providing a link with the past through their archaeological value and traditional cultural activities like turf cutting. People living in peatland communities have cultural and property rights to cut turf from bogs, which clashes with priorities to conserve peatlands for their biodiversity and carbon sequestrations values. The **Community Wetlands Forum** works with local communities, famers and those who are impacted economically by conservation policies to address these tensions, encouraging transition from turf cutting and peat extraction towards more sustainable forms of employment. Although turf cutting is no longer sustainable, the project emphasises other ways in which peatlands continue to provide value through art, eco-social art, books, photography exhibitions, blogs and heritage projects that draw attention to the beauty and biodiversity of bogs, alongside important messages of the value of peatlands for climate resilience.

© Yky, **www.resi-city.com** – A cobble-stoned Parisian alley

Figuring climate change consequences of a Parisian cobble-stoned alley before and after chemical treatment. The darkening process questions the "spirit of the place" and its ephemerality.

108 IPCC Sustainable Development Chapter, 469.
109 Green Paper.

Conclusions

This report has proposed 'climate resilient development' as a pathway to more desirable ways of living in a warming world. It is offered in hopes of advancing an understanding of the cultural enabling conditions of such pathways and the potential of culture-based strategies to realise them. The IPCC has said that actual integration of adaptation, mitigation and sustainable development is 'challenging'.[110] In working with CRDPs, cultural operators must at once be realistic and imaginative.

The characteristics of CRDPs will differ across communities and nations and will be based on deliberations with a diverse range of people, including those most affected by climate change and by possible routes towards transformation.[111] For this reason, there are no standard methods for designing CRDPs or for monitoring their progress towards climate-resilient futures. Low-cost, flexible community-based practices representing low-regrets adaptation and mitigation strategies are a good place to start.

A number of conditions would support cultural actors in this work. These include access to capacity building, information sharing, better data and metrics, and finance. This report does not set out a comprehensive framework for addressing culture in the design of CRDPs. Rather, drawing on the research and cases studies, the following six policy areas are shared for consideration by cities and local governments in their local policies, as well as by stakeholders active in this field, as entry point for further development.

Imagine New Futures

Stoddard et al. argue that a pervasive failure in industrial, modern societies to imagine desirable ways of living that are neither wedded to the carbon economy nor dependent on narratives of progress reliant on perpetual economic growth has been critical to the persistence of current business as usual approaches.[112] Drawing on the emerging field of energy humanities, they note that the traditions, cultures, and beliefs of contemporary, industrial societies are deeply entangled with fossil fuels in what have been called petrocultures and carbonscapes.[113] Ancient knowledge that pre-dates the more than two centuries that fossil fuel combustion and extractive land-use change have underpinned economic development, can point the way to post-carbon living at scale. Indigenous Peoples' and local communities hold worldviews and endogenous interpretations of development that transcend modern make-take-waste approaches. Artistic and imaginative tools support a profound examination of inherited assumptions

110 IPCC Sustainable Development Chapter, 448.
111 Id. at 479.
112 Three Decades of Climate Mitigation, 675-76.
113 Id. at 675.

and desires that hold the potential to 'transformatively reinterpret today's carbon-scape and its accompanying mindsets'.[114] Heritage, culture, and creative voices must train all these talents and more on helping imagine – and realise – new climate resilient futures.

Understand Climate Vulnerability

The realisation of synergies between sustainable development and climate adaptation goals will vary depending on the underlying climate vulnerability contexts. How is the climate of your community expected to change over the next 20 years? Will it be rainier? Hotter? Operators oblivious to expected medium-term climate impacts, changing conditions, and other key elements of risk are not well positioned to contribute to climate resilient futures. A basic ability to engage with climate change profiles and vulnerability scenarios is needed. Downscaled climate models for a given location allow for the identification of possible climate conditions as a function of different global GHG emission scenarios, and indicate climate vulnerabilities and future variability and risks. Such models can be run by many organisations or accessed from partners in the case of others. Participating in vulnerability assessments based on such scenarios is an enormously useful experience. These scenarios will help to map development trajectories resilient to a range of possible climate outcomes and to prepare for the uncertainties inherent in climate change. The variable outcomes based on different emissions scenarios also illustrates the costs of climate inaction.

Engage with Carbon

In order to aid communities in achieving a net zero future in line with the Paris Agreement, those designing CRDPs, including cultural actors, need to be able to measure the emissions associated (or avoided) by relevant activities and identify the most effective ways to mitigate them. Credible emissions accounting and reporting practices, including developing emissions baselines, setting mitigation goals, creating more targeted climate action plans, and tracking progress over time, strengthen opportunities for cultural operators to partner with other sectors and actors, influence policy, and complete for climate finance. Frameworks to measure and manage greenhouse gas (GHG) emissions from operations, value chains and mitigation actions are now commonly used by businesses, organisation, and units of government at all levels. For organisations new to the topic, measuring and managing one's own carbon footprint can be an entry to the topic. Ultimately, however, cultural actors must also engage with the emissions of their whole communities, cities or

114 Id. at 676.

regions, and understand how their sustainable development work can reduce them as part of CRDPs.

Engage with Diverse Partners

Inter-disciplinary and multi-disciplinary work has long been encouraged among cultural operators. Tackling climate change puts a premium on these aims. Compared to single-objective climate versus SDG approaches, CRDP efforts attempt to integrate complex interdependencies across diverse sectors in a systems approach. A recurring theme in the cases studies included in this report is the existence of a diverse, even eclectic set of partners. This includes diverse sectors (agriculture, energy, transport); diverse knowledge systems (traditional, local, experimental); diverse actors and types of expertise. Many involved cross-functional teams of practitioners, experts, and stakeholders. Not surprising, involving climate scientists, activists and policymakers can be indispensable. For government, formally embedding climate change planning in the mandates of arts, culture and heritage bodies can help. Institutional structures able to support coordination among different sectors, including cultural bodies, are needed to achieve low emissions, climate resilient development.

Seek out Synergies; Prepare for Trade-Offs

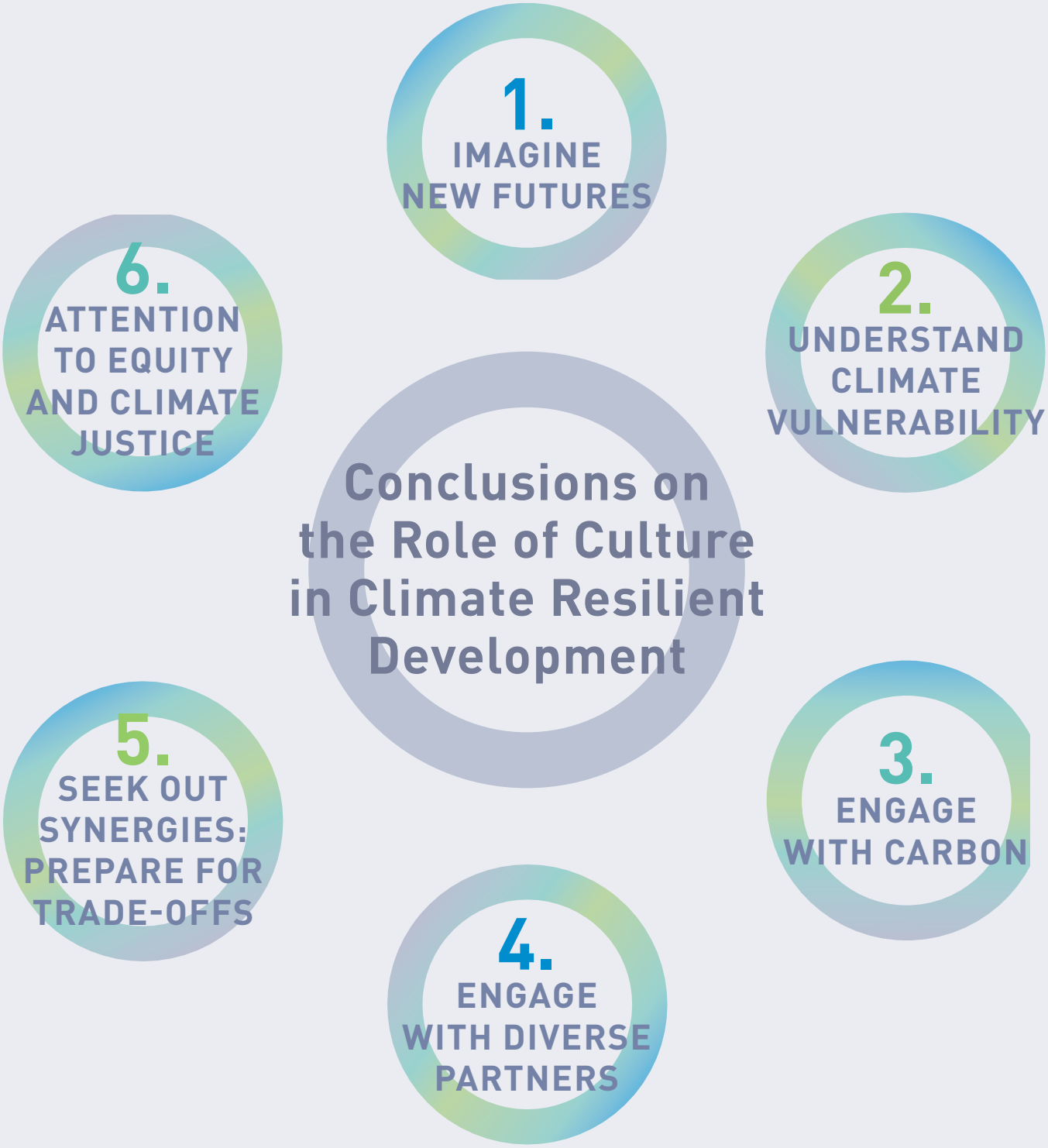
According to the IPCC, real-world experiences at the project level show that reconciling trade-offs across sectors and spatial scales is one of the key challenges to the actual integration of adaptation, mitigation and sustainable development.[115] Real and perceived tensions exist between climate mitigation and adaptation on the one hand and the promotion of culture and the conservation of heritage values on the other. Maladapted activities that damage cultural rights, resources, and values can ultimately undermine environmental objectives. None of these dynamics is unique to culture. Trade-offs among economic, environmental, and social objectives are to be expected. Reconciling trade-offs between development needs and emissions reductions towards a 1.5°C warmer world requires a dynamic view of the interlinkages between adaptation, mitigation and sustainable development. A variety of approaches, both quantitative and qualitative, exist to examine possible CRDPs, and synergies and trade-offs for transformation identified.[116] Ultimately, advocates on all sides must seek to maximise 'win-win' outcomes for people and the planet whilst minimising conflicts between goals.

115 IPCC Sustainable Development Chapter, 448.
116 Id. at 467.

Attention to Equity and Climate Justice

Principles of equity and climate justice are fundamental to understanding and addressing the challenges of climate change. Ethical considerations must guide climate action alongside environmental and natural science drivers. Cultural strategies can help by supporting flexible and inclusive governance structures and broad participation. Such inclusive processes can also help to overcome weak institutional arrangements and power structures that may further exacerbate inequalities. In the political sphere, addressing the culture dimensions roles and the building of common causes with social movements and intersectional interests, linking climate justice with, for example, gender justice and racial justice, and defending the rights of Indigenous Peoples, all tend to support models of justice which in turn enable CRDPs.[117]

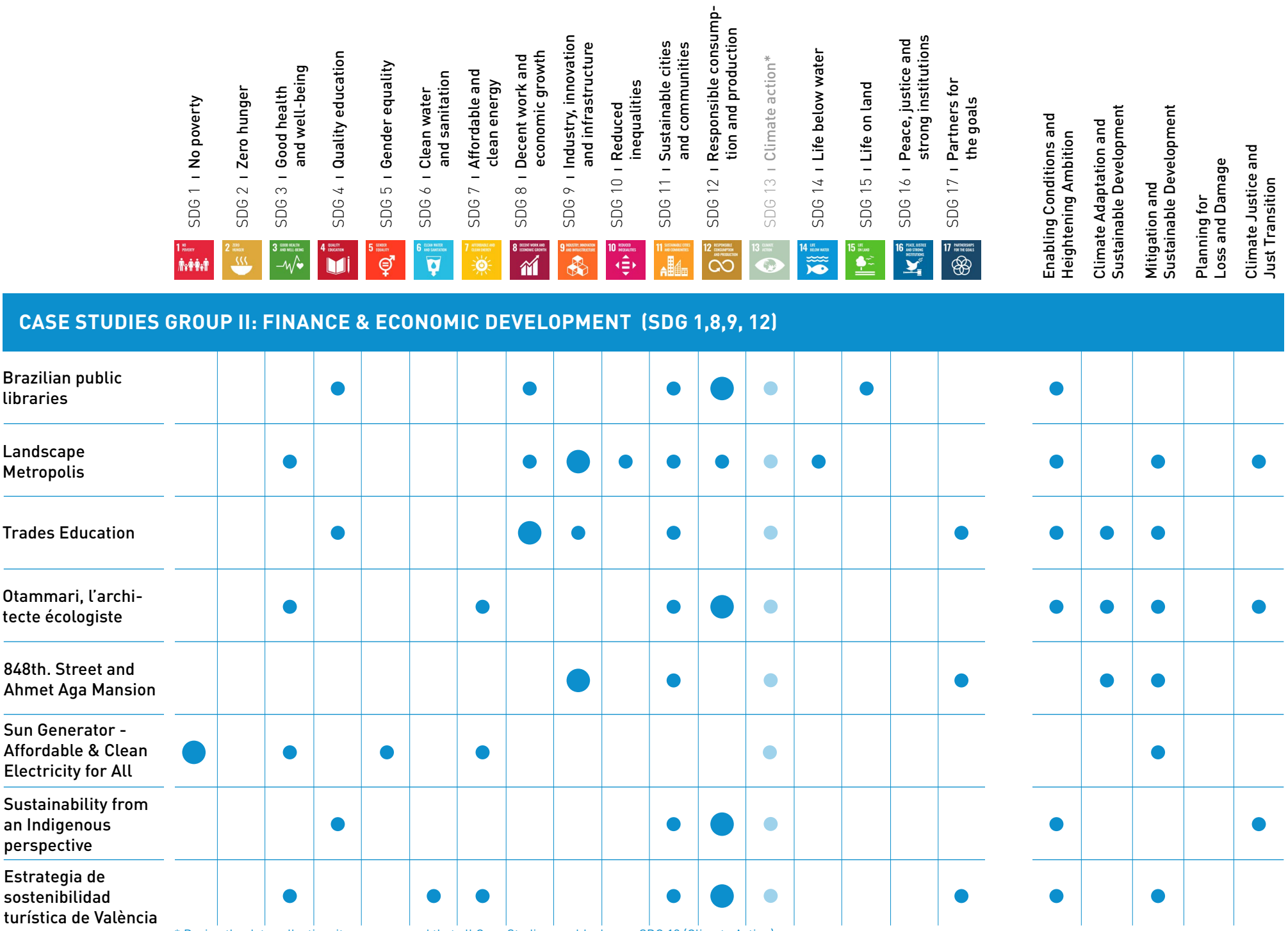
117 Three Decades of Climate Mitigation, 676.


1.
IMAGINE NEW FUTURES
2.
UNDERSTAND CLIMATE VULNERABILITY
3.
ENGAGE WITH CARBON
4.
ENGAGE WITH DIVERSE PARTNERS
5.
SEEK OUT SYNERGIES: PREPARE FOR TRADE-OFFS
6.
ATTENTION TO EQUITY AND CLIMATE JUSTICE
Conclusions on the Role of Culture in Climate Resilient Development

Annex 1: Case Studies Indexation

	SDG 1 ı No poverty	SDG 2 ı Zero hunger	SDG 3 ı Good health and well-being	SDG 4 ı Quality education	SDG 5 ı Gender equality	SDG 6 ı Clean water and sanitation	SDG 7 ı Affordable and clean energy	SDG 8 ı Decent work and economic growth	SDG 9 ı Industry, innovation and infrastructure	SDG 10 ı Reduced inequalities	SDG 11 ı Sustainable cities and communities	SDG 12 ı Responsible consumption and production	SDG 13 ı Climate action*	SDG 14 ı Life below water	SDG 15 ı Life on land	SDG 16 ı Peace, justice and strong institutions	SDG 17 ı Partners for the goals	Enabling Conditions and Heightening Ambition	Climate Adaptation and Sustainable Development	Mitigation and Sustainable Development	Planning for Loss and Damage	Climate Justice and Just Transition
CASE STUDIES GROUP I: HEALTH, SOCIAL AFFAIRS & EDUCATION (SDG 2,3,4,5,10)																						
Climate Action by Hyderabad Children				●					●		●		○		●		●	●		●		
Cultural Skills for Livelihood Resilience	●				●			●					○						●	●		
Denso Hall Rahguzar (Walking Street) Eco Enclave	●		●		●	●		●	●	●			○		●		●	●	●	●		●
Equity in Climate Action Planning										●	●		○						●	●		●
Gullah/Geechee Living Resiliency			●			●			●	●	●	●	○	●	●		●	●		●		●
My Tree House				●								●	○		●			●				
SensaCitizens				●	●						●		○					●				
The Community Recycling Swop Shop		●						●			●	●	○				●	●		●		

* During the data collection, it was presumed that all Case Studies would advance SDG 13 (Climate Action).. All the projects are inherently connected to SDG13 (Climate Action), which is the basis of all the featured case studies.



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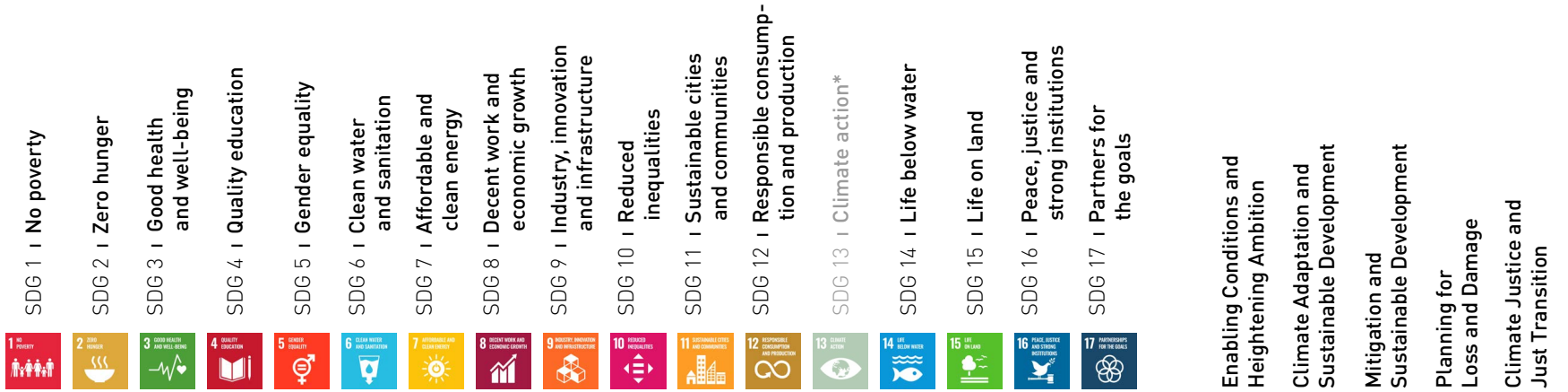
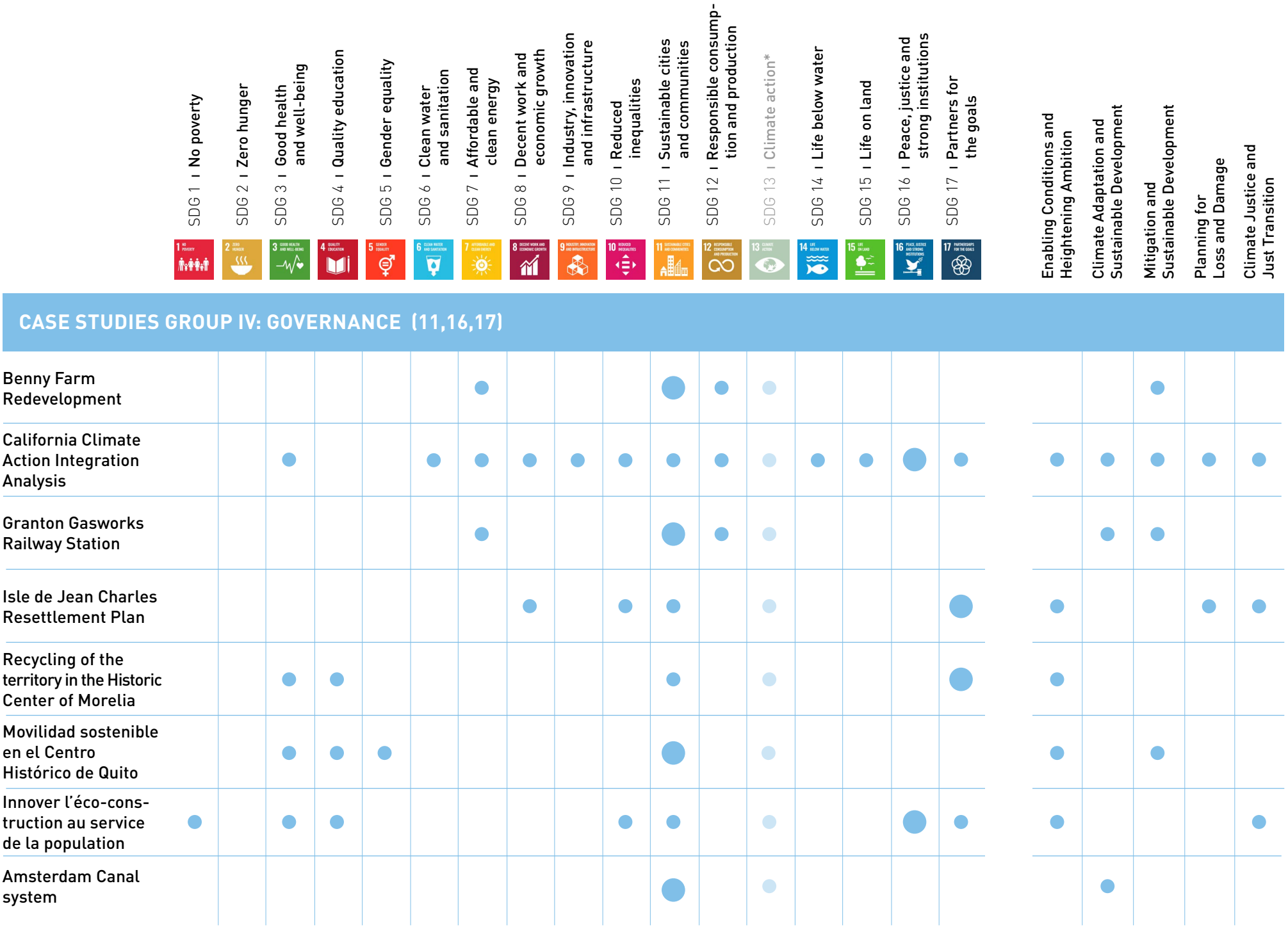
All the projects are inherently connected to SDG13 (Climate Action), which is the basis of all the featured case studies.



CASE STUDIES GROUP III: ENVIRONNEMENT & UTILITIES (SDG 6, 7, 13, 14, 15)

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13*	SDG 14	SDG 15	SDG 16	SDG 17	Enabling Conditions and Heightening Ambition	Climate Adaptation and Sustainable Development	Mitigation and Sustainable Development	Planning for Loss and Damage	Climate Justice and Just Transition
Community Wetlands Forum			●	●		●					●	●	○	●	●		●	●	●	●	●	●
Croatian Coral Centre Zlarin											●		○	●			●	●	●			●
CREBA							●				●		○					●		●		
Melting Snow and Rivers in Flood													○		●		●	●		●		
Penrhyn Castle sustainability							●				●		○					●		●		
Restoring St Helena's cloud forest													○		●		●	●		●		
Revitalization of indigenous aquaculture in Hawai'i													○	●					●			
The Slow Food Prud'homie												●	○	●					●	●		●
Water Environment Improvement of Luchuan Canal			●			●			●	●	●		○		●		●	●	●			●

* During the data collection, it was presumed that all Case Studies would advance SDG 13 (Climate Action). All the projects are inherently connected to SDG13 (Climate Action), which is the basis of all the featured case studies.



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CLIMATE ACTION BY HYDERABAD CHILDREN

INITIATOR	Kirtana V., Raasi M. and Aditi K.
LOCATION	Hyderabad, India
SDGS	
CLIMATE ACTIONS	Ambition Mitigation

DESCRIPTION

After the Fortress town of Golconda in Hyderabad suffered major damage from flash flooding in 2020, local students set out to understand for themselves the problems and to see how they and their mates could help tackle the climate emergency. The result: a game by and for kids entitled 'Climate Action by Hyderabad Children.' In the game, participants are encouraged to learn good 'green deeds,' and to get involved in climate action.

The entire Game including the game board and cards are based on the local heritage. Through this lens, gamers are encouraged to embrace sustainable building materials and to practice the 4 Rs (Reduce, reuse, recycle and repurpose) in daily life – including working to Save Built Heritage and to stand against demolition of existing buildings. The game helps to create awareness among different age groups about climate change and empowers kids to gear up for climate action.

© AR MADHU VOTTERY – Golconda Outer Fort wall with its freshwater moat is a lesser known area to the public. The fort wall (from other part) suffered major damages during flash floods

CULTURAL SKILLS FOR LIVELIHOOD RESILIENCE

INITIATOR	banglanatak dot com
LOCATION	Villages in Sundarban Delta, West Bengal, India
SDGS	
CLIMATE ACTIONS	Adaptation Mitigation

DESCRIPTION

In the Sundarban Delta of West Bengal, India, cultural heritage-based skilling efforts are working to mitigate and adapt to climate change while providing livelihood resilience to local women. Climate change-related hazards like frequent cyclones and rising sea levels in the Bay of Bengal area are threatening the livelihoods of communities, including through increased soil salinity, which affects agriculture.

The project focuses on Sholapith, a marshy reed with a soft white stem, and the related Shola Craft tradition. Local communities traditionally made fine decorative items for festive and social rituals with Shola but lack of interest in younger generations owing to stagnant and seasonal income and low products value was leading to near extinction of the practice. Safeguarding efforts led to development of new, marketable products like flowers and Christmas and other festival decorations that have found international markets, led by women's collectives. Sholapith is also being cultivated for sustainable access to raw material.

The process has led to development of sustainable green livelihoods, resilient even to extreme climate hazard and pandemic situations. The rejuvenation of the traditional cultural skill can help replace plastic and synthetic decorative products, another positive climate action. The communities have welcomed these innovative new uses for their traditional craft knowledge.

© banglanatak dot com

DENSO HALL RAHGUZAR (WALKING STREET) ECO ENCLAVE

INITIATOR	Heritage Foundation of Pakistan's Architect Yasmeen Lari for concept development, funding and implementation with partner for facilitation Karachi Administration's Mr. Irshad Ali
LOCATION	Karachi's City's Historic Core
SDGS	
CLIMATE ACTIONS	Ambition Adaptation Mitigation, Climate Justice&Just Transition

DESCRIPTION

In Karachi's City's Historic Core, hand crafted terracotta pavements and urban tree planting are two keys to this project that uses tangible and intangible cultural heritage to achieve greenhouse gas reduction and climate adaptation through women-led sustainable development. Beggars, mostly women, are trained at the nearby Historical Monuments at Makli, Thatta World Heritage Property in the ancient craft of fabricating low- carbon terracotta cobbles for pavements.

To date, 150,000 terracotta cobbles have been installed, reducing flooding through porous paving while promoting an appreciation of hand-crafted items as opposed to machine made concrete materials and serving as a source of livelihoods that has spawned other low carbon terracotta and glazed tile creative industries.

Over 600 trees have been planted, helping to reduce pollution, promote biodiversity (butterflies, birds, beehives) and prevention of urban heat island. The resulting Denso Hall Rahguzar (Walking Street) Eco Enclave has also shown how communities reduce GHGs while conserving heritage by promoting the use and reuse of existing urban landscapes, reducing vehicular traffic, and avoiding new cement and steel in favour of zero carbon lime, earth and bamboo.

© Heritage-driven low-carbon eco-enclave is vehicle-free, noise/visual/air pollution-free, with 12 heritage buildings, 150,000 hand-crafted permeable pavers, porous pavement, 600 trees and 7 aquifer wells.

EQUITY IN CLIMATE ACTION PLANNING

INITIATOR	City of San Antonio Office of Historic Preservation and Office of Sustainability
LOCATION	San Antonio, TX, USA
SDGS	10 REDUCED INEQUALITIES; 11 SUSTAINABLE CITIES AND COMMUNITIES
CLIMATE ACTIONS	Adaptation Mitigation Climate Justice&Just Transition

DESCRIPTION

The City of San Antonio's new Climate Action and Adaptation Plan is noteworthy for its innovative Climate Equity Screening Tool. Also noteworthy is the City's decision to adopt 'cultural preservation' as one of the tool's five themes, the others being access and accessibility, affordability, health and safety, and security.

Prior to implementation of adaptation strategies, key community equity stakeholders apply the Climate Equity Screening Tool to identify, reduce, and eliminate potential burdens and find opportunities to improve quality of life for vulnerable groups. The cultural dimension of this evaluation critiques each strategy's treatment of the culture, historic resources, and traditions of San Antonio's underserved and vulnerable communities.

The approach attempts to promote climate equity in the City's adaptation work by helping to ensure that vulnerable communities play a central role in the just transformation of the systems established, and that adaptation interventions do not perpetuate the unequal burden of climate impacts. This includes making sure that policymaking, service delivery, and distribution of resources account for the different histories, challenges, and needs of the peoples served.

Climate change presents an enormous challenge to this Texas city. Inclusion of culture in the city's climate equity efforts seeks to ensures that the most marginalized communities are meaningfully engaged in climate planning and implementation and that policymakers have the tools to prioritize equitable outcomes.

© National Park Service – Family observing the use of traditional acequia system to irrigate farm lands near Mission San Juan Capistrano in San Antonio

GULLAH/GEECHEE LIVING RESILIENCY

INITIATOR
Gullah/Geechee Nation, Gullah/Geechee Sea Island Coalition

LOCATION
St. Helena Island, SC, Gullah/Geechee Nation

SDGS

CLIMATE ACTIONS
Ambition
Adaptation
Climate Justice&Just Transition

DESCRIPTION

The Gullah/Geechee Living Resiliency project seeks to build the resiliency of St. Helena Island, one of the Sea Islands in the Atlantic Ocean off the coast of the U.S. state of South Carolina. The project uses the unique Gullah/Geechee culture as a basis for protecting the food security and the land.

Led by Queen Quet, Chieftess of the Gullah/Geechee Nation and Founder of the Gullah/Geechee Sea Island Coalition, the project seeks to support climate change adaptation using nature and ocean-based solutions.

Water quality, good health and well-being are some of the project's sustainability goals. Efforts also aim to reduce poverty by protecting the agricultural lands and the seafood, major industries for the Gullah/Geechee that also literally sustain their bodies.

The people of the Gullah/Geechee Nation are of African and Indigenous descent, and so climate justice is also a must, starting with insuring that St. Helena Island and the Gullah/Geechee culture it sustains will remain intact for future generations. Trade-offs must also be tackled, especially tourism, which is billed as an economic development strategy but exist in tension with both climate action and heritage safeguarding.

The Sea Islands are a tourists destination with cultural heritage exploited by tourism entities of all kinds. The living Gullah/Geechee culture, including sacred knowledge, has to be protected for it to remain within the cultural community and not misrepresented or 'museumized' for tourism consumption.

© Queen Quet from the Gullah/Geechee Sea Island Coalition Alkebulan Archive taken by Kwame Sha - Queen Quet, Chieftess of the Gullah/Geechee nation explains the landscape architectural images to others on St Helena Island, SC in the Gullah/Geechee Nation.

MY TREE HOUSE CHILDREN'S LIBRARY SUPPORTS SUSTAINABILITY LITERACY

INITIATOR	National Library Board, Singapore, City Developments Limited, Singapore
LOCATION	Singapore (national)
SDGS	
CLIMATE ACTIONS	Ambition

DESCRIPTION

With a well-recognised collection for children, Singapore's Central Public Library already had a strong reputation for supporting learning and culture among young people. By effecting a green transformation, the library was able to have a powerful new impact in favour of sustainability awareness among children, as well as demonstrating the possibilities of recycling and greener practices for building.

The initiative works to ensure that children can engage better with environmental issues, using a combination of books and other materials and programmes, in a context designed to inspire imagination and engagement. Activities focus on opportunities to learn about the environment and climate, and there is an enhanced collection of books (around 30% of the total) on green issues.

The programme provides a strong example how to make use of an existing cultural infrastructure - the Central Public Library - in order to support awareness and behaviour change, even from the youngest age. The role of the library space, not just as one for accessing culture, but also for expressing creativity, bringing together different stakeholders, is maximised in service of climate action.

© Courtesy of National Library Board, Singapore. All Rights Reserved. Entrance to the Tree House, National Library Board, Singapore.

SENSACITIZENS. CITIZEN SCIENCE PROJECT IN THE CITY OF MÉRIDA

INITIATOR	FabCity Yucatán AC, Ayuntamiento de Mérida, Museo Palaci Cantón, Museo de la Ciudad de Mérida, Cicloturixes, cero basura Yucatán, UTM, Cultura Savia, Casal Catalá Yucatán, LUM-Universidad Modelo
LOCATION	Ciudad de Mérida, Yucatán, México
SDGS	
CLIMATE ACTIONS	Ambition

DESCRIPTION

In the city of Mérida, a project based on the promotion, dissemination and application of citizens science has been developed to advance climate ambition. It especially focuses on developing skills in youth and adults, empowering women through the use of enabling technology, and taking action to combat climate change.

SenzaCitizens promotes experiences with technology and art in public space, collaborative work, technological empowerment, and the deployment of air quality devices to raise awareness and make visible the current challenges we are facing.

With the aim of educating, training and raising awareness among people of all ages, participatory sessions of collective environmental mapping were carried out in six decentralized locations. Workshops were held to promote knowledge about data visualization and monitoring devices, and environmental monitors and information totems were deployed in the city. These actions made real-time data available to the public and offered an enjoyable explanation of the samples of permitted environmental indices and their adverse effects on health.

In addition, there was a public intervention in the Historic Center, as well as exhibitions with audiovisual material presented in 12 cultural centers and public spaces in the city, which showed the fundamental role of culture in understanding and raising awareness about the environment, promoting actions to generate environmental resilience, and sharing these experiences with other people.

© Intervención pública en el Centro histórico de Mérida para concientización de problemas de calidad de aire.

THE COMMUNITY RECYCLING SWOP SHOP

INITIATOR	Makers Valley Partnership, Love Our City Klean, Victoria Yards, Payper, Nosh and SA Harvest
LOCATION	Makers Valley, Johannesburg, South Africa
SDGS	
CLIMATE ACTIONS	Ambition Mitigation

DESCRIPTION

In Johannesburg's Makers Valley, this neighbourhood collaboration is marrying craft, creative industry, sustainable development and climate action by promoting the concept of a wellbeing economy through social enterprise.

'Love Our City Klean' bills itself as a 'creative waste management company,' seeking innovative ways to reuse materials recycled in the neighbourhood, like making eco-bricks, encouraging young children to make art, or assisting the homeless with materials in order to make items, such as chairs, that can then be sold and generate income. In an area rich with creative industries and crafts people, the aim is for communities to see waste as valuable. Meanwhile, the Community Swop Shop reduces food insecurity and provides access to surplus food items that would have ended up in landfills.

To allow for fair access and a transparent system, the community is encouraged to recycle by a system of points which then can be redeemed at the Swop Shop. This creates a win-win solution not only for those in need of food but for the Waste Management Organisation as it increases their revenue as well as improves the cleanliness of for the area.

This model prioritises collaboration and partnership and aims to make a permanent difference with education about waste reduction and circular economy helping not only to reduce the raw materials being used and limit waste going into landfills, but also to change behaviours.

© Lugile Qhakaza — Community members in queues with their bags of recyclable items in order to drop off at the Love Our City Klean depot

BUILDING CLIMATE AWARENESS AND ENGAGEMENT THROUGH BRAZILIAN PUBLIC LIBRARIES

INITIATOR	City of Rio de Janeiro, Rio de Janeiro State Culture Department, Biblioteca Parque do Estado do Rio de Janeiro (BPERJ)
LOCATION	City of Rio de Janeiro, Brazil
SDGS	
CLIMATE ACTIONS	Ambition

DESCRIPTION

The renovation of a high-profile library provides not only the opportunity to set an example, but also to run climate awareness activities directed at the community, in order to influence behaviours The Biblioteca Pública do Estado do Rio de Janeiro (BPERJ) renovation served not only to provide the community with a more attractive and effective public space (and resource to support learning and skills development, but also to influence behaviours around sustainable consumption and resource use, and of course climate education.

The project focused both on reducing the climate impact of the library itself by seeking to achieve LEED certification, and ensuring an effective education programme, including provision of information, a space for debate, and a point for bringing together different stakeholders. This formed part of the State Culture Department's work to support climate action. It also led to efforts to spread green library practices amongst public libraries across Brazil.

The project focused on a historic cultural institution - the BPERJ - which has a symbolic role in the city of Rio, acting as a key place of meeting and learning. As such, it already had important potential as an exemplar for the wider community. As a cultural space, it was also seen as having powerful potential to support learning, as a place for debate and exchange, and as a hub for creating new partnerships in support of cultural action.

© Nathalice Cardoso

TOURISM SUSTAINABILITY STRATEGY OF VALÈNCIA

INITIATOR	Ajuntament de València, Visit València y Global Omnium
LOCATION	València, Spain
SDGS	
CLIMATE ACTIONS	Ambition Mitigation

DESCRIPTION

In València, a city that attracts more than 2.5 million visitors each year, the tourism sector (public and private) is aligned with the city and its residents in a common goal: to achieve tourism sustainability through an environmental strategy focused on decarbonization, reduction of its water footprint and circularity. To this end, a digital system allows footprints to be calculated and certified in real time, interacting with managers and users to drive reduction and off-setting. Through this approach, the city seeks to reduce air and water pollution, promoting its purification and reuse, and committing to greater energy efficiency and the use of renewable energy sources. The project also encourages sustainable mobility, the protection of cultural and natural heritage, waste reduction and recycling, local economy and sustainable consumption.

The tourist attraction of the city of València is based mainly on cultural values such as its internationally renowned traditions, centuries-old cultural expressions of the region, a lively and participatory popular folklore, and its gastronomy based on local production and balance with the environment, whose interaction with citizens and visitors is enduring. To maximise impact, València highlights to visitors the emissions of cultural facilities they visit and the work being done to reduce their environmental footprint, also promoting the Mediterranean lifestyle and raising awareness of personal and collective action towards urgent climate action.

© Visit Valencia – Embarcadero del Parque Natural de la Albufera de València, espacio protegido por su biodiversidad.

LANDSCAPE METROPOLIS - LANDSCAPE AS MOBILITY INFRASTRUCTURE

INITIATOR	AMI (Mobility Agency), ICOOR (Universities Consortium), CCCC (architects start-up), SIPRO (development agency Ferrara), AESS (Energy and Sustainable Development Agency)
LOCATION	Ferrara (UNESCO City), Emilia-Romagna region, Italy
SDGS	
CLIMATE ACTIONS	Ambition Mitigation Climate Justice&Just Transition

DESCRIPTION

The Landscape Metropolis project aims to enhance the landscape (which is seen as infrastructure) by fostering the regeneration of depopulated areas and connections between the city of Ferrara and its suburban areas through an intermodal-sustainable mobility network, including waterways, cycle lanes, railway lanes, and bus lanes.

A key aim is to reduce C02 emissions as well as pollutants due to the traffic caused by private fossil fuelled vehicles. But the strategy aims to provide a systemic change and a positive impact not only in terms of daily mobility/carbon footprint but also in connection with behaviours, active lifestyles, wellbeing, and social inclusion of the peripheral communities.

The region boasts a rich network of waterways, Natura2000, and UNESCO sites. Sustainable infrastructure will enhance this cultural and landscape heritage. At the same time, culture and heritage are crucial in achieving many of the plan's aims, including the creation of new economies and jobs; building social inclusion between city centres and more peripheral areas; and generating a better quality of living.

So far more than 500 school children have been engaged in the project and, thanks to the involvement of a popular storyteller, have delivered a publication of texts about the landscape. Cultural factors and the mind-set of citizens has also, however, been identified as a challenge in achieving sustainable mobility for the region.

© Jessica Morelli — Landscape Metropolis, Pontile Barca Vista Area.

OTAMMARI, GREEN ARCHITECTURE

INITIATOR	Écomusée Tata Somba
LOCATION	Commune de Boukoumbé, Benin
SDGS	
CLIMATE ACTIONS	Ambition Adaptation Mitigation Climate Justice&Just Transition

DESCRIPTION

The Otammari approach to constructing buildings – an appraoch based on the wise, rational and responsible use of local eco-materials, the application of traditional techniques and the transmission of knowledge based on nature and the earth - is a brilliant example of how the use of traditional practices and knowledge can be a key solution to the environmental and climatic challenges facing humanity.

The principle of Otammari building is to favour the use of environmentally friendly materials which, on the one hand, store atmospheric carbon and thus drastically reduce the net carbon footprint of buildings, and on the other hand, preserve natural resources, as these materials are derived from inexhaustible and renewable natural materials. This use of resources, combined with technical know-how that combines traditional techniques and creative innovation, not only helps the environment - it causes no greenhouse emissions and consumes very little energy - but also improves indoor quality and comfort - the materials absorb carbon.

Otammari construction also aims to encourage communities to learn a healthy and just relationship with the environment, both natural - the land and its resources - and cultural - through transmission, knowledge, innovation and expression, both individual and collective.

© Ibrahim Tchan, 2021 — General view of the Takienta with attics and terraces.

REHABILITATION OF 848TH. STREET AND RESTORATION OF AHMET AGA MANSION

INITIATOR	Project owner and financer İzmir Metropolitan Municipality, Sponsor Izmir Governorship, Department of Investment Monitoring and Coordination
LOCATION	The 848th Street in historical Kemeraltı Bazaar of İzmir, Turkey
SDGS	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 11 SUSTAINABLE CITIES AND COMMUNITIES; 17 PARTNERSHIPS FOR THE GOALS
CLIMATE ACTIONS	Adaptation Mitigation

DESCRIPTION

848th Street is one of the traditional byways of Izmir's famed Kemeraltı Bazaar, where life has continued from the Hellenistic period to present day. This pilot project aims to adapt the neighbourhood, which is built on the fill of an ancient harbour, in order to address the impacts of climate change, while lowering its carbon footprint, safeguarding heritage values, and improving quality of life. Adaptation work included the separation of combined sewer and storm water lines which were causing sewage floods on days with heavy rain.

To help reduce greenhouse gas emissions, infrastructure is being renewed in an energy efficient manner. For example, sodium steam lighting was replaced with energy efficient single-centre controllable, motion sensor and DALI system LED lighting. The redevelopment of the formerly abandoned Ahmet Aga Mansion, located on 848 Street, showcases the inherent energy efficiency of its traditional construction systems, as well as new energy efficiency interventions that were achieved without compromising heritage values. Façades of other buildings along the historic street were also rehabilitated.

Taken together, the project supports the continued use and reuse of this dense, walkable existing built environment – another mitigation win. Since the project area is included in a UNESCO World Heritage Tentative List site, and includes important archaeological resources, infrastructure excavations were meticulously carried out under the supervision of museum authorities. Reconciling the aims and methods of the project with the immediate needs of the residents and adapting their essential requests in the project was a challenging but critical dimension.

© İzmir Metropolitan Municipality — 848th. Street Kemeraltı İzmir

SUN GENERATOR - AFFORDABLE & CLEAN ELECTRICITY FOR ALL

INITIATOR	Nordic Folkecenter for Renewable Energy
LOCATION	Mainly Africa, but can be applied to allo developing countries
SDGS	
CLIMATE ACTIONS	Mitigation

DESCRIPTION

Many areas of the world still lack access to electricity, which limits both development and the populations' possibilities. The Sun Generator aims at solving this gap, via a scalable, 'open source' solution that can be implemented locally, allowing Indigenous Peoples and local communities to continue living in the way they are used to, but at the same time to increase their possibilities and their access to green technologies.

By having universal access to green electricity, economic activities can be started and operated at a low cost. Lung disease attributable to cooking on open fire can be avoided. Women, who traditionally collect wood, are freed up so they can dedicate themselves to other activities. The generated energy comes from the sun, so it is clean. Cooking with electricity reduces the need of burning wood, which can significantly reduce deforestation.

The current cooking technologies used in some developing countries are not meant to be efficient, but only cheap. The result of that is they often have an inefficient combustion, resulting in increased wood consumption. The wood cut contributes to land degradation, which is the first step for desertification. The wide application of this solution has the potential to save entire forests and, with that, significantly reduce the emissions generated by cooking activities.

© Sun Generator — The Sun Generator allow to use a wide range of electrical equipment everywhere in the world, making work in developing countries easier.

SUSTAINABILITY FROM AN INDIGENOUS PERSPECTIVE

INITIATOR	Varanger Sámi Museum
LOCATION	Varanger, Northern Norway
SDGS	12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 4 QUALITY EDUCATION; 11 SUSTAINABLE CITIES AND COMMUNITIES
CLIMATE ACTIONS	Adaptation Climate Justice&Just Transition

DESCRIPTION

This project contributed by the Varanger Sámi Museum in Northern Norway explores the role of local museums in indigenous societies as a communal arena and a resource for future practises based on traditional knowledge.

From an Indigenous perspective, the project is about understanding the connections that support creating long-lasting outcomes from natural resources in accordance with local traditions in a community context. It explores ideas around both balancing resources and balancing the human aspects of integrity and participation in social communities.

One aim is maintaining for future generations traditional knowledge connecting to harvesting activities, which is both culturally and climatically sustainable.

Traditional knowledge is at the core of local practices of harvesting, which is tied to the broader culture and heritage through language, value systems, and practical skills of orienting and behaving in nature. The rights of locals to harvest natural resources are under pressure from a variety of inter-related forces, including climate change, competing interests, and debate on unwritten customs.

© Jorunn Jernsletten – Sámi turfhuts are naturally isolated for an arctic climate

TRADES EDUCATION: A PATH TO WORKFORCE DEVELOPMENT AND AFFORDABLE HOUSING

INITIATOR	City of San Antonio Office of Historic Preservation
LOCATION	San Antonio, TX, USA
SDGS	
CLIMATE ACTIONS	Adaptation Climate Justice&Just Transition

DESCRIPTION

Retrofitting and reusing the existing and historic built environment at the scale required to meet greenhouse emissions reduction targets for the building sector will require a steady supply of skilled building tradespeople, especially if the retrofit work is to be done in a manner that conserves heritage values. Studies show that half of local traditional tradespeople are over the age of 45. With retirements looming, there is a shortage of skilled contractors.

The mission of San Antonio's Living Heritage Trades Academy (LHTA) is to perpetuate traditional trades; to conserve and maintain existing building stock and materials; and to leverage living heritage for economic prosperity. LHTA places students in an apprenticeship with local master craftspeople where they gain real-world experience in the preservation trades. A greater supply of skilled building tradespeople would make reusing existing buildings more affordable and less challenging, thereby supporting the reuse of existing buildings and reducing building demolition. This in turn would conserve the embodied carbon found in existing materials, avoid the environmental impacts of new construction, and help keep building materials out of the landfill. Undertaking retrofit work in a way that safeguards heritage values delivers cultural co-benefits such as anchoring social memory, informing community identity, and instilling a sense of place, all of which are essential to resilience.

The LHTA delivers all these benefits and more, while also providing jobs for a trained, local workforce.

© City of San Antonio Office of Historic Preservation — Students work thoughtfully as they repair a 115 year old wood window and expand their expertise in traditional and sustainable building techniques.

COMMUNITY WETLANDS FORUM

INITIATOR: Community Wetlands Forum, Irish Rural Link, National Parks and Wildlife Service

LOCATION: Island of Ireland (Republic of Ireland and Northern Ireland)

SDGS

CLIMATE ACTIONS: Ambition, Adaptation, Mitigation, Loss and Damage, Climate Justice&Just Transition

DESCRIPTION

In Ireland, Peatlands are viewed as both cultural and natural heritage landscapes, providing a link with the past through their archaeological value and traditional cultural activities like turf cutting. Farmers and people living in peatland communities have cultural and property rights to cut turf from the bog for energy, but this traditional practice now clashes with efforts to conserve bog habitats for biodiversity and carbon sequestration.

As part of Just Transition efforts, the CWF is working to address these tensions and encourage solutions and positive actions that focus on the needs of local communities, famers and others who are impacted economically by conservation policies. The CWF encourages transition from turf cutting and peat extraction towards more sustainable forms of employment, promoting the protection, management and wise use of Ireland's wetlands as places for enjoyment of the outdoors and heritage, environmental education; clean water, and biodiversity.

Just Transition funding builds capacity of CWF to support education, training and raise awareness of the importance of peatlands. The CWF also works toward the restoration of wetlands, which increases carbon sinks to reduce CO2 emissions and helps prevent biodiversity loss to ensure future jobs and food security in agricultural sector. This work also helps to protect water systems that supply wells with drinking water.

© CWF member — Community Wetlands Forum group outing at Schohaboy Bog in County Tipperary.

CREBA - A RESOURCE CENTER FOR ENERGY REHABILITATION OF OLD BUILDINGS

INITIATOR Cerema, Sites et Cités Remarquables de France, Maisons Paysannes de France, Ecole d'architecture de Toulouse, Arts et métiers Paris Tech.

LOCATION France

SDGS

CLIMATE ACTIONS Adaptation
Mitigation

DESCRIPTION

Energy rehabilitation is now a necessity for many buildings in France and around the world. By providing resources aimed at promoting responsible forms of rehabilitation and facilitating the sustainable renovation of heritage and old buildings, the CREBA centre provides building professionals with resources (publications, tools, charter, etc.) enabling them to take into account not only energy improvement in their projects, but also the preservation of heritage and the durability of existing structures.

Clearly in line with the United Nations Sustainable Development Agenda's Goals 7 "Clean and affordable energy" and 11 "Sustainable cities and communities", the initiative makes a very concrete contribution to the sustainability of towns and villages.

CREBA's focus goes beyond providing tools and knowledge on the technical aspect of retrofitting (thermal insulation, heating systems, etc.), and extends to helping residents and occupants to consider other ways of thinking about how they use buildings. In this way, CREBA's work also contributes to reducing the energy consumption of these buildings, whose occupants are often living in energy poverty.

Although tensions between the demand for energy retrofitting and heritage conservation methodologies are still high today, CREBA aims to reconcile these two extremes and to show through education that a more balanced approach is possible.

© Maisons Paysannes de France — CREBA. Application of a corrective hemp-lime coating on a stone rubble wall.

CROATIAN CORAL CENTRE ZLARIN

INITIATOR
The City of Šibenik, Public Institution Nature of the Šibenik-Knin County, Argonaut association and Zlarin Tourist Board

LOCATION
Future Croatian Coral Centre will be located on Zlarin island in Šibenik Archipelago, Croatia

SDGS

CLIMATE ACTIONS
Ambition
Adaptation
Climate Justice&Just Transition

DESCRIPTION

The new Croatian Coral Centre planned for Zlarin Island in Croatia's Šibenik Archipelago will bring together interpretation and research on both the area's biodiversity and cultural history, with an ultimate goal of also supporting the goal of socio-economic revitalisation of the island.

The Centre will present local tangible and intangible heritage surrounding coral harvesting and processing while raising awareness and educating visitors about the endangered maritime ecosystem, climate change and human's impact on them. It aims to raise awareness about the destructive effect that the modern industrial lifestyle has on the maritime ecosystem and biodiversity, through permanent exhibition and by organising educational workshops throughout the Archipelago.

Local artists will be engaged with exhibition areas set in renovated protected cultural properties, thus further valorising local cultural heritage. The idea is to engage actors and promote the importance of sustainable lifestyle in the preservation of the environment and local cultural heritage together. Deep involvement of public, private and scientific actors will focus on social innovation and creating sustainable models of living heritage.

Using both an environmental and cultural frame, the Coral Centre will connect work to protect both life below water and life on land, while revitalising the communities of the Šibenik Archipelago.

© Velibor Krasić – The town of Zlarin.

MELTING SNOW AND RIVERS IN FLOOD

INITIATOR	INTO, The Cross Cultural Foundation of Uganda, the National Trust
LOCATION	9 water sites in the Rwenzori Mountains National Park, and Wang-Lei heritage site, Pakwach western Uganda, Fountains Abbey and Studley Royal Gardens, Yorkshire UK
SDGS	15 LIFE ON LAND; 17 PARTNERSHIPS FOR THE GOALS
CLIMATE ACTIONS	Ambition Adaptation Loss and Damage Climate Justice&Just Transition

DESCRIPTION

This innovative project aims to link water sites located in the Rwenzori Mountains National Park, and Wang-Lei heritage site, Pakwach of western Uganda, with Fountains Abbey and Studley Royal Gardens in Yorkshire UK, creating a unique North-South and South-North dialogue about community-led response to heritage sites at risk of severe flooding.

The project exchanges expertise from Uganda to the UK on an integrated approach, addresses how to reduce the impact of flooding through community engagement, advocacy and physical flood mitigation measures. With a focus on sustainable development, the project highlights the use of traditional knowledge of Uganda's ethnic groups to enhance reforestation of cleared land that is worsening flood impacts. It also highlights the importance of sustainably managed, biodiverse and stable mountain and river ecosystems as integral to the cultural identity of ethnic groups in Uganda.

The project uses a cultural rights lens to amplify the experiences of those on front line of climate change by highlighting how a changing climate and severe weather is erasing cultural sites and threatening the values and cultures of communities.

© Kisa Kasifa, the Cross-cultural Foundation of Uganda — Embugha (Rwagimba) Hot springs wideshot.

PENRHYN CASTLE SUSTAINABILITY

INITIATOR	The National Trust
LOCATION	Bangor, Gwynedd, Wales, United Kingdom
SDGS	
CLIMATE ACTIONS	Ambition Mitigation

DESCRIPTION

Penrhyn Castle in Wales is demonstrating 'cutting edge tech' renewable energy and historically significant heritage sites go hand-in-hand.

Implementation of a locally sourced biomass fuel heating system, on-site solar, energy efficiency in the form of LED and secondary glazing, and heat recovery from wastewater has supported the removal of seven oil heating boilers from the Castle. What's more, the energy transformation of this iconic site has turned it into a community energy development hub and pump primer for the local town.

The primary objective for the project was affordable and clean energy through the efficient use and renewable generation of energy on site but also promoting resilience communities through the use of resources and knowledge. This has not only lowered the carbon and resource needs of the castle but left a legacy and confidence in the local community to develop their own projects.

© Penrhyn Castle, North Wales, demonstrates that even the most culturally significant places have a role in finding solutions to tackle climate change

RESTORING ST HELENA'S INTERNATIONALLY IMPORTANT CLOUD FOREST FOR WATER SECURITY AND WILDLIFE

INITIATOR	St Helena National Trust
LOCATION	St Helena Island
SDGS	
CLIMATE ACTIONS	Ambition Mitigation

DESCRIPTION

Saint Helena, a volcanic tropical island located some 1,950 kilometres west of the coast of southwestern Africa in the South Atlantic Ocean, is home to an internationally important cloud forest. Now, the Peaks Management Plan aims to secure this unique habitat while contributing to the sustainable development by supporting business activities like tourism, forestry and farming that contribute to, and benefit from, the natural wealth of the National Park.

At the same time, the restoration of St Helena's Cloud forest will enhance its carbon sequestration, as well as increase sustainability of water sources for the island. The management plan of the Peaks project will raise awareness among community and a wider public to the ecological and cultural value of St Helena's cloud forest, and the need to preserve it.

The implementation of the management plan will provide appropriate infrastructure to enhance the visitor experience (improved access, new focal points, new interpretation and new safeguards for environmental impacts). Public engagement aspects of the project, education and upskilling via community planting events, schools' outreach, volunteering and training opportunities will embed the social and cultural legacy of protecting this natural heritage.

© Mike Jervois — Peaks National Park, St Helena

REVITALIZATION OF INDIGENOUS AQUACULTURE IN HAWAI'I

INITIATOR	Hui Mālama Loko I'a
LOCATION	Communities throughout the islands of Hawai'i
SDGS	14 LIFE BELOW WATER
CLIMATE ACTIONS	Adaptation

DESCRIPTION

Traditional Loko i'a (Hawaiian fishponds) once could be found across the islands of Hawai´i, representing advanced food systems that optimize the natural functioning of watersheds and estuaries. Today, their revitalization addresses food security challenges of this island community while increasing the perpetuation and adaptation of cultural practice in the face of a changing climate. In terms of sustainable development, Loko i´a are highly managed food systems with responsibilities historically tied to the communities of the adjacent coastline.

Fishpond restoration increases community cohesion and relationship-building, increasing the resilience of Hawai´i's communities by restoring the reciprocal relationship to land and ocean resources to achieve abundance. In the face of sea level rise, Loko i´a revitalization contributes to climate adaptation by ensuring the endurance of knowledge about these productive estuary systems and potentially allowing creation of new areas for fishpond construction.

Loko i´a production once provided abundant and sustainable protein to a population nearly as large as the million plus people in Hawai´i today, and the ability to adapt that management knowledge to a changing environment will be critical for increased self-sufficiency as well. But Loko i´a are just one piece of a complex social and political system that informed resource management throughout Hawai´i.

Practitioners today are committed to maintaining the holistic spiritual and relational foundations of fishpond management, an approach that they emphasise is key to the transfer and expansion of collective traditional knowledge and the perpetuation of culture and practice.

© Kim Moa; provided by KUA. Makāha (indigenous sluice gates) are focal points of fishpond management. Combined with contemporary technology, they continue to be places of observation and adaptation.

THE SLOW FOOD PRUD'HOMIE

INITIATOR Slow Food

LOCATION Sanary-sur-Mer and the La Seyne-sur-Mer-Saint Mandrier , France

SDGS

CLIMATE ACTIONS Adaptation
Mitigation
Climate Justice&Just Transition

DESCRIPTION

The Prud'homie community of fishermen on the French Mediterranean coast presents a compelling example of how traditional governance systems can be models of contemporary climate governance as well. This ancient system now helps support climate adaptation efforts while continuing to deliver sustainable biodiversity outcomes and contributing to the cultural identity and cohesion of the territory. It is also a flagship example of Slow Food's work to prevent the disappearance of local food cultures and traditions at risk of extinction.

The Prud'homie designate a group of fishers who come together to jointly manage the resources of the sea in a sustainable way, based on a community model that has evolved from medieval trade guilds that have been managing French marine resources for over ten centuries. Prud'homie play an essential control and conservation role in marine zones, preserving a historic cultural model and participating in everyday port life.

Their aims include preserving fish stocks and regulating fishing equipment, restricting total catch, regulating specialization and intensification, encouraging fishers to be versatile and to use low intensity fishing gear. The fishermen sell most of the 80 distinct species that they catch directly at the dock.

Through their activities and communal management system, they contribute to achieving the sustainable management and efficient use of natural resources and sustainably manage and protecting marine and coastal ecosystems. This deeply culturally engrained local governance system stands as a model for how local communities can cope with the challenges of the climate change and the biodiversity crises.

© Alexis Fossi — Fisherman of the prud'homie Slow Food Community in the southern France with the catch of the day.

WATER ENVIRONMENT IMPROVEMENT OF LUCHUAN CANAL

INITIATOR Water Resources Bureau of Taichung City Government, Taiwan International Institute for Water Education

LOCATION Taichung City

SDGS

CLIMATE ACTIONS Ambition
Adaptation
Climate Justice&Just Transition

DESCRIPTION

At the Luchuan Canal in Taichung, cultural heritage is being used to raise awareness of climate change and social impacts. The project aims to enhance city flood protection and better ensure local water sources while integrating ecosystem and biodiversity values into city canal planning. To do this, the project involved planting thousands of native trees along the renovated riverbank, on-site water treatment, and riverbank renovation. Support for vulnerable group support, young generation inclusion, and environmental education were also included.

The project used public-private and civil society partnerships plus the community's cultural heritage as a basis for developing consensus about how to adapt the site. Environmental education is also a feature. Beyond these aims, the project will reduce the number of illnesses from wastewater pollution, upgrade and retrofit infrastructure for rainwater recycling-reusing, and promote the social, economic and political inclusion of homeless group and foreign workers.

© Taichung City Government — Along Taiwan main railway, the water environment improvement ... hung Luchuan Canal served as the integral zipper of city history, ecological corridor, tourist pathway, and water ... he

BENNY FARM REDEVELOPMENT

INITIATOR	Selected organizations: Architect/planners: L'OEUF; Occupants: Benny Farm Residents; Housing agency: Canada Mortgage and Housing Corporation; Sustainability assessment: Holcim Foundation
LOCATION	Montreal, Quebec, Canada
SDGS	
CLIMATE ACTIONS	Mitigation

DESCRIPTION

Begun in the 1990s, the Benny Farm Redevelopment projects bills itself as the world's first government-subsidized, community-driven neighbourhood rehabilitation project that combines affordability, green building technology, and preservation, rehabilitation and new construction.

The project pushed boundaries, not only of sustainability but of built heritage conservation. Located in Montreal, Benny Farm was originally slated to be demolished and its site redeveloped. Advocates for reuse had to content with perceptions it had little heritage value. Ultimately, however, the legacy of its original social housing purpose and ties to the 'Amsterdam School' style of architecture and urban planning inspired by the "Garden City Movement" won out.

Thirty years after its beginnings, it now also has a legacy of early integrated social and environmental activism. The project embodies reuse in every sense, seeking to preserve the physical fabric but also the development's original social mission of affordability, social quality, green public spaces. The former was the subject of an environmentally sensitive renovation and construction (material reuse, waste minimization, energy efficiency, emissions reduction) and establishment of a non-profit, community-run utility company to manage the new district geothermal heating system.

The buildings themselves may not be a prototype for replication, but the values, intentions and stakeholder-led design process by which they were developed represent a new model for community-driven sustainability that can be applied universally. Given the vastness of the global stock of aging residential buildings and inequitable distribution of wealth, such a model, the project sponsors note, is an urgent necessity.

© Susan Ross — As a neighbourhood-scale and community-driven project to retrofit housing originally built for veterans of the Second World War, the broad social and environmental goals of the site's renewal included keeping the housing affordable. The rehabilitation work not only improved the comfort and energy performance of the housing, it reduced the need for new materials, by removing, sorting, cleaning, storing and reusing the bricks, radiators and wood flooring.

CALIFORNIA CULTURAL HERITAGE AND CLIMATE ACTION INTEGRATION ANALYSIS

INITIATOR State of California

LOCATION State of California

SDGS

CLIMATE ACTIONS
Ambition
Adaptation
Mitigation
Loss and Damage
Climate Justice&Just Transition

DESCRIPTION

SDG16 aims to promote strong institutions, but what does good governance look like at the intersection of climate change and culture? The State of California has undertaken a comprehensive effort to understand how culture intersects with the climate change-related work of its boards, departments, and agencies. The effort analysed both areas where culture or heritage was already playing a role and those where it could add new value, for example aiding in human behavioural change.

The ICOMOS 2019 report 'The Future of our Pasts: Engaging Cultural Heritage in Climate Action' was used as a framework for the analysis. In the process, awareness of the value of cultural heritage as a tool for both mitigation and adaptation was infused deep within areas of state government, from environmental protection to natural resources to agriculture. Traditional cultural knowledge as known by the more than 140 California Indian Tribes was also a focus. At the beginning, some state government partners were unsure how culture and heritage might connect to their own climate work, particularly when related to intangible heritage.

Through consistent meetings, information sharing, examples, and efforts, relevance to agency work and the State's larger climate action goals became more evident. As examples turned into successes, others were encouraged to find areas of incorporation for their own projects. While there is still a lot of work ahead, the wins in awareness, acceptance, and actual excitement over incorporating cultural heritage into climate action across government have increased.

© Simona Clausnitzer, Scripps Institute of Oceanography. California Climate Vulnerability Index Assessment workshop. Partners working to derive a collective 'value' definition for the assessment of China Camp State Park.

GRANTON GASWORKS RAILWAY STATION

INITIATOR	City of Edinburgh Council, ADP Architecture, Keir Group Scottish Government, Historic Environment Scotland
LOCATION	Former Granton Gasworks Railway Station, 10 Waterfront Broadway, Edinburgh, UK
SDGS	
CLIMATE ACTIONS	Adaptation Mitigation

DESCRIPTION

The planned refurbishment of Granton Gasworks Railway Station in Edinburgh will transform the long-standing vacant building into a modern, sustainable and adaptable space for businesses to thrive. Forming the centre-piece of a major public realm initiative at Waterfront Gateway, the existing, listed building is to be sensitively re-purposed with internal and external fabric improvements including new windows, improved insulation and improvements to access aimed at improving energy efficiency, performance and accessibility.

Level access will be formed from the new square and new lift, stair and accessible welfare facilities serve to offer up flexible spaces to a high specification which will attract and retain modern business and innovation occupiers. Sustainability and climate change are at the heart of the approach to the landscape design for project. The design incorporates principles of sustainable drainage and ecology and is sensitive to its historic context, forming an integral part of a project which will see the listed station building transformed to a new enterprise hub.

Considered a car-free development, the building is exceptionally well served by public transport and cycle network. The scheme required much multi-disciplined partnership to balance the demands of developing a modern, flexible multi-let business space and public realm while addressing sustainability and climate change and facilitating a public conversation about how best to preserve the special architectural character and historic interest of this listed building.

© Adp-architecture.com - Redeveloped railway station building, former railway platforms and public realm works with sustainable urban drainage incorporating rain and gardens and open amenity space

ISLE DE JEAN CHARLES RESETTLEMENT PLAN

INITIATOR	Louisiana Office of Community Development, Isle de Jean Charles Biloxi-Chitimacha-Choctaw Tribe of Louisiana, Terrebonne Parish, Foundation for Louisiana, Louisiana Land Trust, Concordia Architecture and Planning
LOCATION	Terrebonne Parish, Louisiana, USA
SDGS	
CLIMATE ACTIONS	Adaptation Mitigation

DESCRIPTION

The island of Isle de Jean Charles in the U.S. state of Louisiana is rapidly disappearing into the Gulf of Mexico due to coastal erosion and sea level rise. Residents of this region, predominantly of American Indian ancestry, represent an incredibly unique and diverse culture of people who have lived there for hundreds of years.

In 2016, the State of Louisiana was awarded $48.3 million dollars by the U.S. Government to work with residents to develop and implement a structured and voluntary retreat from the island into safer communities. This includes developing The New Isle, a planned community about 40 miles north of Isle de Jean Charles that will include more than 500 homes, walking trails, a community centre, commercial and retail space and other amenities.

The project aims to create a holistic approach to the Resettlement that will illustrate best practices and lessons learned for consideration by other diverse and culturally rich communities facing climate-driven relocation. Collaborations with current and past island residents on the design of the new community was meant to support the preservation and continuity of islanders' diverse cultural identities and traditions. The project also includes community gardens, storytelling activities, craft demonstrations, and historical exhibits.

The immensely difficult project, which raises complicated issues of adaptation and cultural continuity, is subject to competing levels of governance which has been a source of tension, for example between the State of Louisiana and tribal authorities over the administration of federal grant funds.

© Waggonner & Ball — Design professionals took part in listening sessions with the predominantly indigenous residents of Isle de Jean Charles to inform site planning and community spaces at the "new Isle.".

CITIZEN PARTICIPATION TO ACHIEVE SUSTAINABLE MOBILITY IN THE HISTORIC CENTRE OF QUITO

INITIATOR	Municipio de Quito, Instituto Metropolitano de Patrimonio; Comunidad
LOCATION	Centro Histórico de Quito, Patrimonio Mundial 1978
SDGS	
CLIMATE ACTIONS	Adaptation Mitigation

DESCRIPTION

Quito's historic center is exposed to various sources of environmental pollution, often exceeding recommended international indices. Therefore, the city aims to develop in a participatory manner a safe mobility system that connects public spaces in ways that prioritize pedestrian circulation and increase the quality of life of the inhabitants. It also emphasizes the need for comprehensive, connected solutions with broad, interdisciplinary working groups that take into account the community and its traditional knowledge of its city and territory, as well as its cultural and historical context.

This project is part of the 1st Strategic Axis of the Quito Historic Center Plan: "Formation of an intermodal network of mobility and sustainable public spaces, with programs for safe pedestrian mobility, intermodal transportation and environmental activation".

Its foundations were the recognition of the actors of the historic city as bearers of its history and identity, the integration of the community through participatory processes and the recognition of heritage for the construction of its identity and appropriation, emphasizing joint responsibility. Subsequently, within the parameters established by the SDGs and the New Urban Agenda, a sustainable planning instrument for urban development was proposed that included all stakeholders in the territory through integrative practices and the use of the Historic Urban Landscape as a tool.

© Belén Peréz, 2019 — Pedestrianization of García Moreno Street in the Historic Center of Quito. Promoting sustainable mobility for the reduction of carbon emissions, as part of the pilot plan of the Programa Calles Seguras (Safe Streets Program).

POWER, MANAGEMENT AND HERITAGE: RECYCLING OF THE TERRITORY IN THE HISTORIC CENTER OF MORELIA

INITIATOR	Coordinación General del Centro Histórico de Morelia
LOCATION	Zona de Monumentos. Morelia, Michoacán, México
SDGS	
CLIMATE ACTIONS	Mitigation

DESCRIPTION

The Historic Center of Morelia has become a space of convergence between climate ambition and built heritage. The main objective of the project is to reduce stress on the environment and to enhance the circular economy of the region by promoting the reuse of existing buildings, urban landscapes, and monuments for new purposes, without losing their heritage values. Contemporary practices have also been implemented to enhance this reuse capacity and promote its uptake.

In this way, the reuse of the heritage assets respects the exceptional universal values of the site and the elements of the historic landscape. Temporary artistic expressions are also carried out in spaces previously reserved for automobiles. An example of this is the execution of a performance for the printing of a collective graphic mural of the Clavijero Cultural Center on 40 meters of canvas. The work was performed by 30 artists on the vehicular street, interacting with the inhabitants during its elaboration.

©Morelia

PROTECTION AND CONTINUED FUNCTIONALITY OF HISTORICAL SLUICES AND GATES IN THE AMSTERDAM CANAL SYSTEM

INITIATOR	Waternet (Regional Water Authority Amstel, Gooi en Vecht), Amsterdam (department of Mobility and Public Space)
LOCATION	Amsterdam, since 1275 consisting of functional, water based cultural heritage; object of this case study: the dike protecting the historical city center and more precise: its sluices and gates in the canals crossing the dike
SDGS	
CLIMATE ACTIONS	Adaptation

DESCRIPTION

Since 1275, Amsterdam has boasted a system of dikes, sluices and gates protecting what is now the historical city centre. A changing climate including stronger rain and sea level rise now underscores the need to maintain the functionality of this water heritage in the growing city.

Sluices and gates were operated on a daily basis in protection of Amsterdam until 1872, when harbour development disconnected the city from the sea and its tidal action. After this development, these sluices and gates have been functional only in high water periods, totalling just a few instances in decades. Climate stress however threaten much more frequent periods of high water.

In response, the city is now upgrading the operational functionality of its historic system of gates and sluices. This functional water heritage is proving to be a critical asset in a delta city under pressure (population growth, use of public space, and climate change). Moreover, re-using this water heritage reflects the identity of people living in the delta and shows that we can learn from the past to deal with adaptation today.

© Waternet — Testing of the closing of Nieuw Entrepotdoksluis, November 2020.

A MUSIC PLATFORM IN THE TOWNSHIP OF CAPE TOWN - INNOVATING ECO-CONSTRUCTION FOR PEOPLE

INITIATOR
Building for Climate Architectes, Université Technique du Cap, Ville du Cap, Lycée de Steenberg Township, Fondation d'entreprise Alstom pour l'environnement

LOCATION
Afrique du Sud, Le Cap, Steenberg Township

SDGS

CLIMATE ACTIONS
Ambition
Climate Justice&Just Transition

DESCRIPTION

The creation of a music platform in Cape Town township is a great example of how cultural activity and knowledge generation can contribute to raising awareness and empowering communities in climate resilience and environmental responsibility by providing them with the infrastructure for artistic expression and cultural sharing.

This participatory project, initiated in the township of Steenberg in the Cape Town region - an area affected by the aftermath of Apartheid where people too often lack access to basic public services, including cultural services - has not only provided the community with a real space for creating and practising music, but has also generated awareness among the population, and particularly among young people, of the ecological impact of human activities - and thus their direct impact - on the environment.

With the support of local NGOs and private foundations through a multi-stakeholder partnership, the creation and maintenance of the music platform has made it possible to respond to the triple challenge of education, the fight against inequalities, and ecological responsibility, while guaranteeing support for the project and the generation of knowledge within the local communities thanks to a bottom-up approach centred on know-how, learning and the revaluation of the human-nature relationship.

© Building For Climate, architects, Paris, France & Steenberg High School, Steenberg Township, Cape Town, SA

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Supported by

The European Union

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of United Cities and Local Governments (UCLG) and does not necessarily reflect the views of the European Union

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This document has been financed by the Swedish International Development Cooperation Agency, Sida. Sida does not necessarily share the views expressed in this material. Responsibility for its content rests entirely with the author.

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