Department of Geography and
Environmental Science

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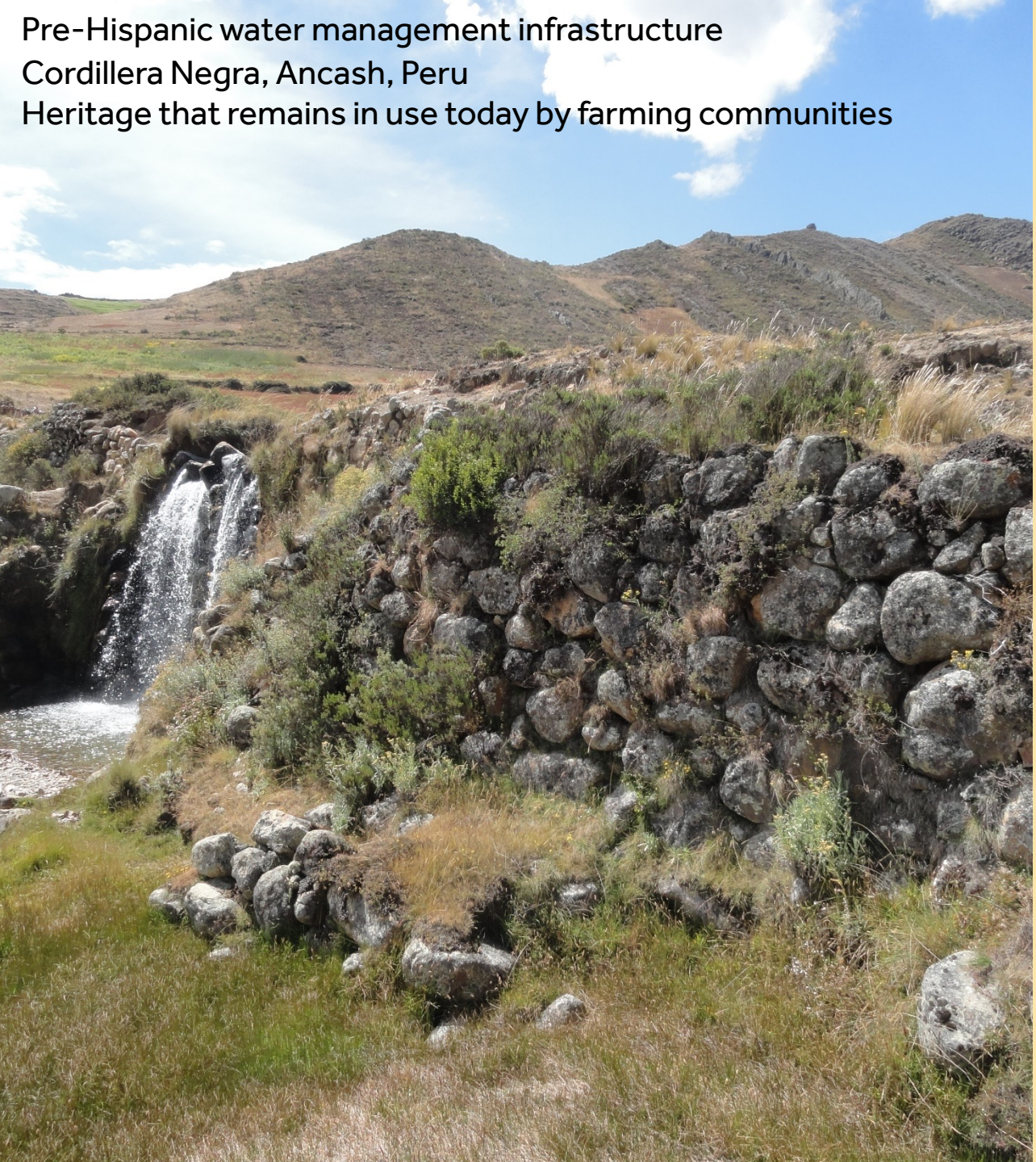
Cultural Heritage and Adaptation to Climate Change in the Peruvian Andes

Professor Nicholas Branch



Pre-Hispanic water management infrastructure
Cordillera Negra, Ancash, Peru
Heritage that remains in use today by farming communities

People, climate and heritage

- Climate change is being experienced through highly variable and less predictable weather, and associated impacts on the environment (e.g., reduced water availability), and especially agro-pastoral farming (e.g., poor potato or maize yield productivity)
- Less predictable weather patterns, according to our social science data, is causing widespread challenges due to variable rainfall patterns and increasing temperatures at higher elevations (among other issues)
- One aspect of our research is to use cultural heritage, coupled with environmental science and indigenous knowledge, as a means of initiating socio-economic development and benefits for rural farming communities


Wetland modified by pre-Hispanic water management infrastructure
Apurimac, Peru
Sampling for environmental science research

Our approach

- We draw upon cultural heritage data from across the Holocene and Anthropocene, including indigenous knowledge and experiences, and attempt to translate this understanding into the development of adaptation policies and practices for the future
- The sources are diverse: archaeological, ethnohistorical, ethnographical, together with environmental and social science, climatology/meteorology, and agronomy and rural development
- NGOs and local farming communities are key to co-production of projects, with the NGOs forming an important bridge between researchers and the communities, as well as government institutes

Cultural heritage and adaptation 1

- Wetlands and water management infrastructure
  - Wetlands (created [artificial] and modified [natural] by human agency) have been an important part of agro-pastoral farming for millennia
  - They store important information about our cultural heritage in the form of sub-fossil biological remains and sediments (‘proxies’), as well as climate and environmental history
  - They have been heavily utilised by communities since pre-Hispanic times supplying water for agriculture and grazing land for camelids, and continue to do so today [provisioning ecosystem services]
  - They have associated water management infrastructure (WMI), especially pre-Hispanic dams and canal systems, which have been important for water security, and continue to do so today
  - They are also significant for a range of regulating ecosystem services, including carbon sequestration and biodiversity

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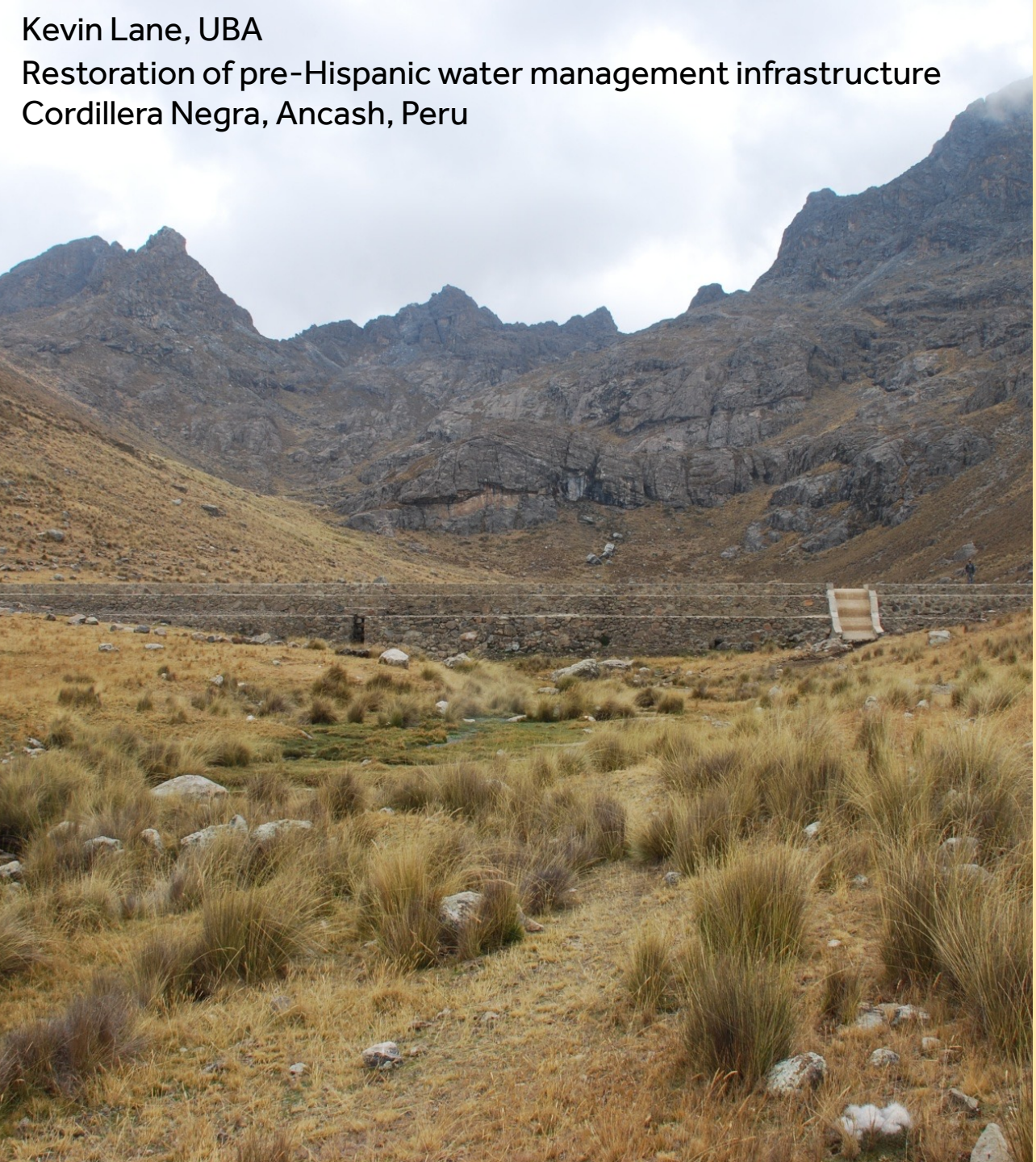
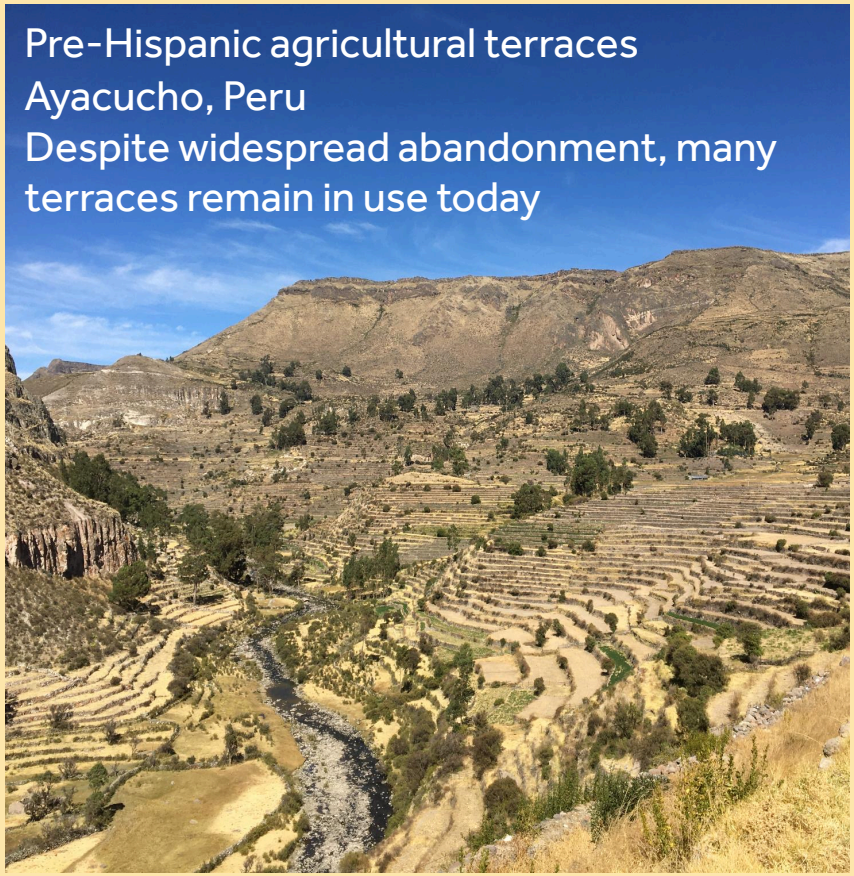

Kevin Lane, UBA
Restoration of pre-Hispanic water management infrastructure
Cordillera Negra, Ancash, Peru

Cultural heritage and adaptation 1

- Wetlands are threatened by increased evapotranspiration, and poor management and protection
- The consequences are serious for future water security and agricultural sustainability
- Adaptation measures that have been implemented include the restoration of pre-Hispanic WMI drawing upon cultural history and indigenous knowledge, coupled with the long-term monitoring of wetland health by communities to ensure their sustainable use
- We advocate for the transfer of knowledge gained from cultural heritage for the protection and management of wetlands, and their ongoing utilisation, and the restoration of pre-Hispanic WMI for the benefit of communities

Cultural heritage and adaptation 2



- Agricultural terrace systems (irrigated and non-irrigated)
- Experiences of climate change (past and present) vary geographically
  - Challenges due to unpredictable precipitation patterns, increased evapotranspiration, soil quality deterioration, and crop selection (among others)
  - Opportunities afforded by increased water availability (e.g. glacial meltwater) and higher temperatures at altitude (among others)

Pre-Hispanic agricultural terrace soil
Apurimac, Peru
Environmental science permits understanding of their function and development e.g., crop selection

Cultural heritage and adaptation 2

- Cultural heritage and environmental science permits understanding of their function and development under different past climatic regimes
- They signify sustainable, intensive and diversified farming
- We advocate for their rehabilitation through the transfer of knowledge gained from cultural heritage and indigenous knowledge, and the contribution they make to the enhancement of agrobiodiversity

Concluding comments

- We advocate for the use of knowledge gained from cultural heritage, as well as environmental science and indigenous knowledge, to very specific social and economic circumstances
- Adaptation measures, in our experience, require long-term local community and NGO collaboration, as well as ongoing monitoring
- The latter will permit us to remain agile; changing adaptation practices to fit circumstances, especially when the future dynamics of major weather systems (ENSO, SASM and ITCZ) remain uncertain


Local community and NGO workshop

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