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INTEGRATED UPSTREAM AND DOWNSTREAM THINKING TO MITIGATE THE WATER SECURITY CHALLENGES OF PERUVIAN GLACIER RETREAT

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ABSTRACT

The Santa River is the first basin, at a national scale in Peru, where international aid organizations have offered humanitarian aid, because of the frequency of disaster events, many related to climate change and glacial retreat. Over recent years, NGOs and international institutions have begun work on mitigation activities e.g. environmental management adaption, changing agricultural practices, etc. but to date their impact has been point-specific, reactive and isolated. Although, the Santa basin is the most studied catchment system in Peru in this regard, the increasing rate of scientific publications has not yet translated into the development and improvement of management and adaption policies. For example, Morera et al. (2013) found that the Santa catchment has the highest erosion and sediment transport rates along the Pacific coast – reflecting the susceptible geology and intense mining activity - but to date there has been no policy response. In the face of identified problems, key policy questions remain unanswered; e.g. does transitioning of land use affect water balance (i.e. from bofedal, páramo, jalca into grassland, agriculture, mining, etc) and how are these changes augmented/affected by glacier hydrological processes and retreat, subsurface water and groundwater dynamics. These critical scientific-technical gaps are made worse by the lack of tools or strategy to integrate scientific evidence of spatial and temporal dynamics of basin changing basin processes with ecosystem service provision in the water-foodenergy security nexus. Our strategy encompasses working with four key stakeholder groups; (1) National agencies and the management community; (2) water and hydropower industry; (3) NGOs and commercial practitioner companies; and (4) Peruvian and UK citizens and taxpayers; in order to fill the gaps above and bring real change in policy through a combination of stakeholder engagement, training and knowledge exchange activities. These are integrated with the research programme permitting research and impact to develop iteratively in parallel.

Keywords: glacier, stakeholder, soil erosion, mountain ecosystems





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Figure 1. Water-energy-food-livelihood interconnectivity, and pressures on the nexus, in the Rio Santa catchment. Stakeholders include: a) National agencies, b) Decentralized administrations, c) Management community, d) Tourism and recreations, e) Third sector, f) Water industry, g) Hydropower, h) National research institutions and i) International research organizations (see Pathways to Impact).