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Article abstract

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COMMENTAIRE CRITIQUE / CRITICAL COMMENTARY (ÉVALUÉ PAR LES PAIRS / PEER-REVIEWED)

A Critical Approach to the UNESCO Principle "Scientific Knowledge and Integrity in Decision Making" in the Face of Climate Change: Contribution of Andean Indigenous Knowledge

Sakiko Yamaguchi[a], Junior Adolfo Villantoy Huaman[b], Celia Yanira Flores[b], Julián Berrocal Flores[c], Doris Castillo Gamboa[b]

Résumé
L'article 7 de la Déclaration des principes éthiques de l'UNESCO, intitulé « Connaissances scientifiques et intégrité dans la prise de décision », peut négliger les systèmes de connaissances locaux et traditionnels des communautés autochtones. Pour remédier à l'injustice épistémique à l'égard des connaissances autochtones en matière d'adaptation au changement climatique, il est important de s'engager avec les communautés autochtones en tant que membres égaux de la société et d'apprendre de leur compréhension relationnelle et holistique de la nature.

Mots-clés
UNESCO, éthique, changement climatique, Andes, injustice épistémique, savoirs traditionnels autochtones, science

Abstract
"Scientific knowledge and integrity in decision-making" as presented in the UNESCO Declaration of Ethical Principles Article 7 may neglect existing local and traditional knowledge systems of Indigenous communities. To address epistemic injustice towards the Indigenous knowledge in climate change adaptation, it is important to engage with Indigenous communities as equal members of society and learn from their relational and holistic understanding of nature.

Keywords
UNESCO, ethics, climate change, Andes, epistemic injustice, traditional indigenous knowledge, science

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INTRODUCTION

The urgency of taking action on the negative impacts of climate change on health is recognized globally. At the 28th UN Climate Change Conference (COP28) in December 2023, the COP 28 Declaration on Climate and Health was launched, aimed at advancing climate-resilient development, strengthening health systems, and building resilient communities for the benefit of present and future generations (1). Reported impacts of climate change on human health include the adverse effects of global warming on the cardiopulmonary system and the gastrointestinal tract, an increase in waterborne diseases and infectious diseases such as typhus, cholera, malaria, dengue, and West Nile virus infection, as well as malnutrition due to the impact on food production and access to safe water (2-4). Although climate change affects all regions of the world, its negative effects exacerbate global health inequalities and iniquities: Low- and middle-income countries (LMICs), as well as the most vulnerable groups whose capacity to adapt is the weakest, are more susceptible to diseases and physical injuries and mortality during natural disasters, such as floods and cyclones, brought on by climate change (3,4). Climate change also interacts with gender inequalities, resulting in more negative health impacts on women, such as malnutrition and the incidence of infectious diseases (5).

Such multifaceted vulnerabilities and their unequal distribution give rise to ethical issues of fairness and responsibility (3,6). As climate change is a global phenomenon with intergenerational effects, its spatial and temporal dispersion of cause and effect indicates that multiple actors, such as governments, the private sector, and society, have a moral responsibility to mitigate the impact of climate change concerning human health (6,7). However, global tensions are present with the question of dispersed responsibility as well as fair sharing and equitable distribution of the benefits and burdens of climate change, adaptation, and mitigation policies and responsibilities to address them (8). Particularly, challenges remain around questions of intergenerational justice (that is, what is owed to future generations) and value conflicts between the human and non-human world (8). In this context, key gaps on ethics, climate change, and human health are identified: a lack of understanding of the importance of ethics in policy-responses to climate change, a shortage of ethical commentary on a range of key topics in the environmental health literature, a lack of literature from LMICs, and limited discussion of inter-disciplinary ethics in relation to climate change (8). In particular, specific action guiding the production and dissemination of ethical resources that provide practical pathways and policy options for researchers and practitioners are warranted (8).

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RECONSIDERING THE UNESCO PRINCIPLE "SCIENTIFIC KNOWLEDGE AND INTEGRITY IN DECISION-MAKING"

Within this context, the development of extended ethical frameworks in health and climate change could help guide the actions of practitioners. One such example is the *Declaration of Ethical Principles in relation to Climate Change* adopted by the member states of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2017. The six shortlisted principles, 1) Prevention of harm, 2) Precautionary approach, 3) Equity and justice, 4) Sustainable development, 5) Solidarity, and 6) Scientific knowledge and integrity in decision-making, were globally agreed upon based on the initial ten principles of adaptation and mitigation in climate change proposed in 2015 by UNESCO and COMEST (World Commission on the Ethics of Scientific Knowledge and Technology).

Among these principles, Article 7 "Scientific knowledge and integrity in decision-making" pays specific attention to the modes of knowledge required to make a sound decision in response to a range of climate change challenges. It aims to enhance the social processes through which science disseminates its findings for the benefit of all and informs decision-making and policies for the implementation of relevant long-term strategies (9). The principle indicates that scientists play an important role in filling the knowledge gap in climate change, actively following strategies, and communicating with policymakers as well as the public (9). In parallel, the Declaration also draws attention to traditional Indigenous knowledge, stating "Decisions should be based on, and guided by, the best available knowledge from the natural and social sciences, including interdisciplinary and transdisciplinary science, and by taking into account, as appropriate, local, traditional and indigenous knowledge" (Article 7) (9).

As suggested by the Declaration's principle, a strong emphasis is placed on scientific knowledge as evidence to inform decision-making in environmental management policy and practices. However, there is a risk of creating a dichotomy between academic ecological knowledge and traditional Indigenous knowledge, thus further marginalizing the latter (10,11). Despite efforts to integrate local traditional knowledge, as long as academically trained scientists have the power to decide when to incorporate local knowledge into research and adaptation planning, unequal power relations will remain (11,12).

Ethnoscience, the study of the knowledge system and practices held by different cultures, emerged in the mid-twentieth century, reflecting Western scientists' approaches to non-Western/Indigenous knowledge rooted in colonial history of expansion of European states (13,14). In the seventeenth century, information of Indigenous people's practices regarding plants and animals collected by European naturalists during their colonial excursions were initially considered as "primitive" or "savage" (13,14). As anthropologists discovered people's deep knowledge and holistic view of their environment and their application to planning and management of natural resources, the significance of "Indigenous" and "local" knowledge in other disciplines of science was recognized (15,16). However, conceptualization of Indigenous knowledge in ethnoscience which developed in the context of extraction and coloniality of Western countries is critiqued for perpetuating a colonial logic and marginalizing traditional knowledge in policy and practice (11,13).

In the context of climate change policies, recognizing the existing knowledge hierarchy that underrepresents Indigenous knowledge, commentators have described many climate adaptation policies as being epistemically unjust towards Indigenous people (12). Fricker's (17) notion of epistemic injustice explains two underlying forms: 1) *testimonial* injustice occurs when the credibility of the knowledge holder is denied due to prejudice of the receiver of knowledge against an aspect of social identity such as race/ethnicity, gender, and disability, and 2) *hermeneutical* injustice happens at the systemic level where certain people are marginalized when they are excluded from shaping shared social meaning of human experiences due to a lack of epistemic resources to convey their knowledge with existing language. For instance, hermeneutical gaps occur when Indigenous cultural and spiritual claims do not map onto available categories within the Westen legal system (18).

Both forms of epistemic injustice are seen in the Peruvian Andean context where several climate adaptation policies and strategies continue to ignore the interests and knowledge of Indigenous peoples (12,17).

ANDEAN COSMOVISION AND WOMEN'S TRADITIONAL KNOWLEDGE

In the face of climate change, there is a call for an epistemic rupture to gain new knowledge by recognizing different cosmovision and ancestral wisdom (19). Andean Indigenous activists and researchers argue that it is critical to understand a specific sociopolitical structure and processes where climate adaptation policies and strategies are implemented: they note in particular that asymmetric power and multiple vulnerabilities based on race, ethnicity, class, and gender shape the multilayered vulnerabilities of Indigenous populations, particularly women, to climate change and its impact (20,21).

In the Andean cosmovision, people's health and well-being are closely linked with *Allim kawsay* (good life) built on reciprocity through the *Uywanaku* (caring coexistence) and *Parlanakuy* (spaces of conversation). As Andean community people commonly say, *"Kawsaypachapiqa lliwmi kawsan"* (In the world of the living, everyone has life) (22). Their cosmovision indicates that the *Pacha* (mother earth) or the World is a place where not only human beings but also everything in nature, such as rocks, hills, plants, rivers, forests, mountains, and animals, are considered as living organisms. The *Pacha* and all that is necessary for the flow of life (*Kawsay*), including *Runas* (Human beings), fauna and flora, and *Wamanis* or *Apus* (Deities), are tied and complementary to each other. The Andean perception of a harmonic interrelation with people, nature, and animals extends care and respect for the environment (19,23,24). In this Andean epistemology, Quechua ways of knowing (*Yachay*)

are associated with the collective capacity to nurture, which is an attribute of all living organisms in the *Pacha* (mother earth) (24).

In Andean society, where the family is at the core of production, women bear the major share of responsibility for ensuring the survival, welfare, and health of their families. They support agricultural work and animal herding while sustaining families by preparing food, caring for animals and children, maintaining food, and securing the health of family members (22). In the family and community space where *machismo* has shaped patriarchal gender relations, Andean women, particularly in rural areas, face numerous barriers that prevent them from actualizing their rights to education, health, equal treatment, and a life free from violence (25). Beyond the family space, women often take on subsidiary roles, whereas men occupy leadership positions in community decision-making (26). While educated young women are starting to be more involved in community meetings and less educated older women are respected as knowledge holders who transmit valuable experiential knowledge, most women are still restricted from controlling the land, as they are represented either by their husbands or fathers in the community council (26-28).

Despite this persistent gender inequality, Andean women's experiential knowledge and ability to make decisions in everyday life to prioritize local communities and networks of care could be leveraged not only for transformative adaptation but also for fulfilling individual and community well-being (23,27,28). In the *Pacha* where human beings and nature are inseparable, women have continued to contribute to sustainable farming practices that manage native crops, including choosing appropriate planting dates and practicing festivities to give thanks to nature and to strengthen a collective support system in the community (29). In addition to their role in sustaining food security through cultural practices, Andean women have acquired knowledge and technical skills in the selection and conservation of seeds for crops such as potatoes and maize (27,29). They often determine which plant resources to conserve and use, which seeds to select, which crop varieties to grow, and which food products to keep for home consumption and which to sell at the local market (27,29).

Moreover, women play an important role in transmitting their knowledge as biodiversity keepers to younger generations, which is critical for the survival of the family and the retention of culture (27,29). Rural women are also involved in the care of herd animals such as alpacas, sheep, and llamas, which are important income sources. They accumulate experiential pastoralist knowledge and practice, bringing animals to pasture, monitoring signs of distress and illnesses, as well as reproduction, and treating animals when they are sick (22,30). Women inform community decisions to shift their herds between pastures, guided by their expertise on seasonal patterns of rain and temperature as well as daily observations of animals' health and behaviour (22,30). As such, with this Quechua view of the world, women have nurtured knowledge of care, which fosters and maintains bonds of reciprocity and mutual care and protection in their daily living, called *"uywanakuy, nanachinakuy"* (caring and being cared) (24).

EPISTEMIC INJUSTICE TOWARDS ANDEAN INDIGENOUS KNOWLEDGE

Andean women's knowledge could potentially contribute to climate change adaptation strategies. However, many Andean women are reported feeling fear and insecurity because of how their partners treat them in the environment created by cultural values and practices of *machismo*. Such feelings make women anxious about speaking in public or expressing their ideas to unfamiliar people, and some even hold back from experimenting or learning something new as they doubt their capability (26). As such, women's voices oftentimes have less influence, and they have limited access and control over resources.

Furthermore, historically, in Peru, both Indigenous and peasant cosmologies were considered "primitive" and neglected as a barrier to modernity (21). Today, government officials see Indigenous farming practices as inefficient and outdated (21). Due to testimonial injustice, the dominant discourse on development that promotes capacity building and technical assistance fails to recognize Andean smallholder farmers' agricultural knowledge that has been used for adaptation. In addition, not recognizing the value of Indigenous knowledge can be due to hermeneutical injustice where epistemic and ontological differences make it hard to communicate their knowledge in a manner that can be understood within the dominant climate adaptation discourse (12). The Quechua language plays a key role in articulating and transmitting Indigenous knowledge based on the Quechua cosmovision, which stresses the reciprocal relations and interactive practices between humans and nature: unique wisdom about plants, animals, and water systems are transmitted through oral histories while living on *Pachamama* (Mother Earth) (19,24). However, Quechua's holistic understanding of nature is often hindered by the dominant Western paradigm of nature that sees the environment as existing independently from human beings as well as stigma associated with speaking Quechua in public spaces (19,24,31).

As reported by UNESCO's World Network of biosphere reserves, engaging with Indigenous knowledge and epistemologies has been a challenge that requires a fundamental shift in how to conceive and conduct science (32). Despite the growing emphasis on collaborative approaches aiming for knowledge "co-production" to address this challenge, limitations of integrating different knowledge systems exist due to substantial differences of Indigenous epistemologies and values from conventional science (11,32). Not simply seeking common grounds but acknowledging these differences can create room for different actions and answers to complex socio-ecological challenges at a local level, paving the way for negotiation of practice and policy through self-determination of local communities (11). Moreover, it is critical for science communities to acknowledge the persistent epistemic injustice and discrimination in current global science-policy landscape where there is still present a historical continuity of ethnoscience driven by assimilation, extraction, and coloniality (13).

CONCLUSION

Since the Andean Quechuas acquire and share knowledge based on interacting with the environment through mutually supportive relationships, simply applying the principle “scientific knowledge and integrity in decision-making” as presented in the UNESCO Declaration of Ethical Principles may neglect context-specific vulnerability as well as existing local and traditional knowledge systems. While scientific evidence and advancement are critical for climate adaptation policies, it is imperative to recognize how the current climate language and discourse are skewed toward Western scientific approaches in order to facilitate meaningful integration of Indigenous knowledge and practices (12). As smallholder farmers in the Andes have been historically socioeconomically disadvantaged in Peru and still suffer from persistent impoverishment and marginalization, addressing the socioeconomic inequalities underlying the prejudices is required. We thus call for the scientific community to disrupt their existing epistemic paradigm by engaging with Indigenous communities as equal members of society and to learn from their relational and holistic knowledge of nature (10,12).

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