Accounting for the Multiple in 'One Health' – A pragmatic approach to engage with context based local knowledge and disciplinary perspectives

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Highlights

- One Health approach encourages to break down disciplinary barriers but also to open up towards the actors of society, with the idea of co-producing original knowledge in matters of health.
- With a set of case studies and experiences from different locales the paper attempts to provide a framework for a colearning and management plan.
- Knowledge networking is crucial to bring out all the available knowledge, to make it visible and shareable with each other while retaining its own logic and epistemology.
- There is no one size fit all approach to One Health, it should be co-planned based on contextual realities

Abstract

One Health has primarily focused on infectious diseases, without adequately considering the nuances of the environment or biocultural diversity. Its focus has predominantly been on the scientific perspective without taking into account the locally generated Indigenous knowledge or local concerns and consequences of measures adopted in terms of biosecurity and bio-monitoring and their acceptance by the communities concerned. With the recent global policy developments including the One Health High Level Expert Panel (OHHLEP) and the pandemic it appears to have become more broader in scope and more inclusive, yet it continues to face multiple implementation challenges.

Drawing on a set of case studies from different regions this paper seeks to explore the multiple in One Health. It explores how we can better integrate the practical experience of local communities into the One Health approach and how anthropology as a learning approach can contribute to this. By citing specific case studies, the article argues for reckoning the co-created, even shared knowledge of different life forms, within an ecosystem and their dynamic nature. It argues that knowledge networking is crucial to bring out all the available knowledge, and to make it visible and shareable with each other while retaining their own logic and epistemology. Finally, the article points out that there is no one size fits all approach to One Health; it should be co-planned based on contextual realities.

Keywords: One Health, local knowledge, epistemologies, transdisciplinarity, knowledge coproduction

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1. Introduction

The integrated approach and unifying character across sectors and disciplines have been consistent features in the One Health framing. With the conception of the One Health Joint Plan of Action (FAO, UNEP, WHO, and WOAH, 2022) and its national level implementation guidelines, local knowledge and community level practitioners have acquired a fair space within its policy-practice interface. Despite advances, significant challenges persist in designing methodological approaches capable of engaging with context-specific knowledge and plural evidence bases (OHHLEP, 2022). Yet difficulties remain in terms of developing pragmatic, methodological approaches and models in dealing with the local context based knowledge and the multiple, pluralistic evidence base. A persistent challenge for One Health, therefore, is to bring to the fore the tensions between its universalizing framework and the imperative to remain attentive to situated, multiple forms of knowledge and practice (Law, 2015).

Among the various forms of knowledge, we, as anthropologists involved in several health related projects for years, are thinking in particular of knowledge held or mobilized daily by local populations, who, let us remember, are located on the front line of animal reservoirs. By showcasing illustrations of local knowledge exemplified by ethnoveterinary cases from diverse contexts the article highlights potential perspectives and pathways of engaging with local Indigenous knowledge and practitioners (Mumford et al., 2023; Pollowitz et al., 2024). It particularly responds to the fifth OHHLEP underlining principle which includes 'transdisciplinary and multisectoral collaboration, which includes all relevant disciplines, both modern and traditional forms of knowledge and a broad representative array of perspectives' (OHHLEP, 2022).

Our guiding question is how could we better account for biocultural diversity and more crucially how could it be concretely integrated? Before formulating proposals that go in this direction, it seems necessary to start by examining what the local knowledge is and in particular what it is made up of, highlighting its dynamic essence and showing that some of it is co-constructed with other forms of knowledge, including extra-human knowledge. If the knowledge of local communities is shaped by the relationships they maintain with other actors in the field, it is also the result of constant interactions with other creatures (animals, plants) present in their environment.

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Keeping this in mind, we will then argue that engaging in a One Health approach should result in a pooling of all available knowledge and different modes of understanding illness and health, without *a priori* establishing a hierarchy between different regimes of knowledge, whether expert, scientific or lay. This includes relocating One Health and addresses its multiple as well as rethinking the way to co-create and produce knowledge.

2. Knowledge co-constructed within the biocultural space

Firstly, it is critical to remember that local knowledge is not reduced to simple economic rationality, but includes a whole set of social, cultural, ecological, and religious elements (Berkes, 2000). Multiple forms of rationality preside locally in terms of relationships with the environment or animals; hence influence disease control and transmission. Understanding how local knowledge shapes epidemiological context is a crucial element to be taken into consideration within One Health. As shown with the various Ebola episodes in Africa, putting aside local knowledge and practices in favour of biosecurity measures does not allow to contain disease transmissions and stem the epidemic. In this case, only a focus on the local representation of the diseases and the understanding of local practices have notably shed light on the epidemiological impact of local funeral practices for the spread of the virus (Manguvo et al., 2015; Iduwu et al., 2020).

Concerning local knowledge, as reminded and acknowledged by anthropologist Alicia Davis and geographer Jo Sharp, the rich Maasai ethnography they produce teaches us that regarding what we could call a pastoral epistemology, there is no such alterity and demarcation between human, animal, or the natural environment. In fact, for the Maasai, animals do not only constitute their main livelihood, their folklore, stories, and songs have also been shaped by and integrated in their relationships with their livestock and the environment (Davis and Sharp, 2020). This way, in Tanzania, the historical Maasai farming system was based on the practical experience of the local population, rooted in and part of culture, which reflects a specific relationship with the environment. In this system, research foreground the way in which disease is seen as part of the environment, and preventive and curative measures were put in place at local level (Waller, 2012). For example, ticks were controlled by burning grasses, while certain diseases such as East Coast fever or rinderpest were deliberately allowed to circulate in order to maintain high levels of immunity in animals and reduce the risk of epizootics emerging and spreading (Waller and Homewood, 1997). Nevertheless the colonial policy and more recently the advent of Modern state in the contemporary period

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gave little consideration to the various Maasai communities and their knowledge but rather marginalized them (Waller, 2012).

Secondly, due to the importance of the surrounding environment and the specific relationships with its different elements, it seems necessary to take a step aside to consider questions of conservation and management of biodiversity through equitable local partnerships. Within them, the knowledge of local communities has been recognized for several decades by multilateral bodies, in particular for their capacity to sustainably manage resources and conserve biodiversity. For instance, Article 8J of the Convention on Biological Diversity (CBD) places particular emphasis on the preservation of local knowledge associated with bioresources and sharing benefits gained through bio-prospecting of such knowledge. This states that "the knowledge, innovations and practices of Indigenous and local communities that embody traditional lifestyles relevant to the conservation and sustainable use of biological diversity must be respected, preserved and maintained." (CBD, 1992). As an extension, the Nagoya Protocol governs access to genetic resources (animal, human and plant genomes) since its entry into force in 2014. It puts the emphasis on the need to involve local communities in research so that they have access to scientific knowledge, participate in its construction and share the benefits.

Biodiversity plays a vital and integral role in shaping diverse knowledge and practices, particularly within rural and local communities around the globe (Sobrevila, 2008). Likewise, the erosion of biodiversity actually leads to a loss of knowledge about it and can therefore have consequences for local communities. We can even go beyond the acknowledgement of the crucial link between biodiversity and cultural diversity by assuming that certain local knowledge is partly constitutive of elements of the environment and is co-produced in interaction with them. This is what emerges from an investigation conducted by the first author on the daily relationships between humans and elephants in Laos, highlighting the fact that mahouts and elephants share knowledge about medicinal plants (Lainé, 2017). As part of a research project on the local perception of tuberculosis in elephants, the mahout informants insisted on the fact that village elephants have a rich knowledge of the forest, expressed in their search for specific specimens and plant parts during an illness episode. The mahouts are aware that if they provide the plants necessary for a healthy diet, the elephants can supplement that diet. And when they move particularly in the forest to work with wood or when they are left free in the evening, the elephants express an instinctive sense to pick appropriate remedies from diverse vegetation that they encounter. In Laotian villages, unlike

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elephant management in tourist or conservation centres, mahouts and elephant owners do not claim to control all aspects of the animals' feeding and care. According to them, the forest is the equivalent of a pharmacy (*hank ka ya*) where the elephants can choose a selection of medicines for themselves. And when a village elephant appears sick, the mahout voluntarily leaves the animal alone in the forest for a few days so that it can regain health (Lainé, 2020). Such intuitive practices of animals are further affirmed by a recent report of self-treatment of a facial wound with a biologically active plant by an orang-utan in Sumatra (Laumer et al., 2024).

This example illustrates that animals possess knowledge of their environment and can actively engage with it under certain circumstances. For a long time, however, such non-human knowledge was marginalized by modern science, often dismissed as anecdotal or insignificant. In contrast, local communities have long relied on animals' knowledge in their everyday resource management. For instance, livestock farmers in the Hungarian steppe carefully observe and incorporate their animals' food preferences to enhance animal health and maintain the diversity of grazing areas (Molnár et al., 2016). Today, Molnár and his team work collaboratively with Hungarian herders, co-producing knowledge that bridges scientific and local expertise (Molnár et al., 2020). Examples like this, among others, have convinced many scientists, ecologists, and animal behaviour specialists that the animals they study do indeed hold knowledge of their environments.

In terms of animal health, the development of research in zoopharmacognosy, a recent branch of ethology, explores self-medication behaviour in certain animals. These animals demonstrate the ability to seek, find, and select natural medicinal molecules or psychotropic drugs in specific circumstances (Huffman, 2014). Every day, new cases are being discovered among species such as great apes, horses, elephants, and even ants (Csata et al., 2024).

For many local communities, aspects of the natural world—like animals, plants, rivers, or landscapes—are not just resources but also carry and convey cultural meanings, values, and practices from one generation or group to another. This has been highlighted by several anthropological works. Among these, let us reflect on the research conducted by Florence Brunois-Pasina, who, working over a long term in Papua New Guinea, showed how the Kasua community has borrowed certain of their behaviours – expressive, sexual, technical, ceremonial, even ritualistic – from animals with which they co-evolve (Brunois, 2005). The result is the learning of an interspecific way of life between the Kasua community and not a

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specific animal species, but with the diverse life forms of the forest - animals, plants or even spirits. The Kasua readily admit to having borrowed many of their techniques, gestures and performances from these entities (Brunois-Pasina, 2020). In another project Florence Brunois-Pasina studied the pharmacopoeia of the Batooro in Uganda and their shared knowledge with chimpanzees regarding medicinal plants. Her research revealed that the Batooro observe chimpanzees using specific plants for self-healing and have incorporated these practices into their own traditional medicine. Of the 155 plant species identified, 47 are consumed by chimpanzees, with 18 recognized as medicinal by both primatologists and locals, treating similar ailments. For example, plants like *Rubia cordifolia* and *Ficus exasperata*, used by Batooro for abdominal issues, are similarly consumed by chimpanzees. The Batooro view chimpanzees as partners in forest knowledge. However, their exclusion from forests due to recent conservation measures threatens this shared understanding, tying its preservation to chimpanzee survival (Krief and Brunois, 2017).

These different in-depth ethnographical research findings demonstrate that contrary to the way in which animals, and more generally biodiversity, are presented to us and are considered by scientists, in local communities, animals are not perceived as a threat nor necessarily considered as a source of disease. If we consider health more precisely, we also realize that for a number of communities including the Tai-Lue in Laos or the Batoroo in Uganda, health is not considered from a single, anthropocentric, point of view. It is rather thought of as a set of relationships and interactions that must be maintained to ensure the sustainability of a socio-ecological balance. This holistic vision is illustrative for local communities as there exists so many interactions with diverse elements in a shared environment. For example, a study carried out on the ethnoveterinary knowledge of the Ilkisonko Maasai of Kenya showed that the Maasai rely not only on clinical signs but also on disease vectors; the effects of seasons and climatic variations; and the set of species affected by a particular disease in terms of veterinary diagnostics related to their livestock (Ole-Miaron, 2016).

Taken together, the various examples highlighted so far reaffirm the fundamentally context-specific and situated nature of knowledge, whether knowledge of local communities, non human species, or scientific, while also reminding us that such forms of knowledge are not fixed or bounded but continually co-produced through interactions across environments, practices, and epistemologies.

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3. Anthropology to access and account for local knowledge

We have seen that one of the components of local knowledge relies on its interactionist and sometimes interspecific character constructed in relation to the environment. Another aspect is that this local knowledge cannot be considered as a finished, accomplished element, but rather as the outcome of a dynamic process in constant recomposition. Let's remember that for a large number of communities around the globe, local knowledge is not a written one. It is transmitted according to several learning methods in a more or less formal framework within a specific group. Thus, any local knowledge is constantly reproduced or even reinvented in an iterative process of praxis and adaptative to environmental changes (Berkes et al. 2000). This is precisely what anthropologist Marie-Claude Mahias documented on the know-how of local communities from the Indian subcontinent. She says that the local knowledge in fact can only be understood during concrete action (Mahias, 2011). Each instance of implementing local knowledge involves people, objects, and materials. Regarding the relationship between herders and animals, it is important to take into consideration that human actions are applied to living beings, which themselves have the capacity to act on the environment and, reciprocally, to influence humans. We have seen this with the earlier examples on animal knowledge.

In addition, local knowledge covers dynamic but also political aspects: such knowledge is situated at the heart of social and, ultimately, power relations as shown on issues related to biodiversity conservation (Roué, 2003). Within a group it reveals the status and position of each by showing who the knowledge holders are, who has access to it and how people acquire knowledge. That way, local knowledge reflects on the social organization of relationships within a group. To the extent that they are part of the local socio-political game, it is equally important to consider their cohabitation with other present knowledge regimes. This means that locally each community not only takes into account their practices and representations linked to animals and the environment, but also to consider the relationships that they maintain with all stakeholders (veterinarians, members of NGOs, etc.). For example, local herders make various choices in animal care and health based on available resources. They may prepare plant-based remedies, consult local healers or veterinarians, or let animals self-medicate using natural resources. The set of practices employed reflects the specific logic for a specific local knowledge system which may blend local and scientific based care perspectives. The study of these practices in their context sheds light on the gap that may

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reside between the discourse based on the logic of knowledge and the rationality of practices and avoids essentializing local knowledge (Massé, 1997).

To understand the dynamics that takes place every time knowledge is mobilized, ethnography as an approach of anthropology is ultimately well positioned. Through its approach (long-term field survey, bottom-up approach) and its collection methods (participant and repeated observation of practices, attention to details, collection in vernacular language, interviews or even life stories), this discipline makes it possible not only to account for the diversity and complexity of relationships with the environment, but also to grasp the dynamics of the different knowledge involved in each situation. Regarding local knowledge, anthropology is not only interested in what people know, but also in how they learn and transmit this knowledge. While documenting the representations that individuals have it also pays attention to the practices that result from them and the meaning that individuals give to them. By fully immersing in communities, field surveys allow a researcher to open up reflections on the constitution, evolution, and the arrangement of diverse knowledge regimes.

It is then not so surprising if today, there is an appetite for research in the Humanities and Social Sciences (HSS), and in particular anthropology, which is increasingly being invited to take part in research projects based on the One Health approach (Whittaker et al. 2020; Woldehanna and Zimicki, 2015). Until now, when HSS researchers were mobilized to take part in multidisciplinary health-related projects, they were often confined to a role of mediators between scientists and local communities. Their intimate knowledge of context and local communities were mobilized to strengthen links between communities and public authorities, or to better adaptation measures and their acceptance to the local context, taking cultural aspects into account (Venables et al., 2017). In the field, because they build long-term relationships of trust with communities and have a good knowledge of the local language, anthropologists are mobilized to restore the knowledge of local populations about and with their environment. It should be remembered that the study of community knowledge is, so to speak, the core of the discipline's work, which is based on lengthy field surveys immersed in the communities. With regard to the specific approach of anthropologists, we can even say, following a recent article by Tim Ingold, that anthropologists do not study peoples or communities per se, but work *with* them and engage in a dialogue about their ways of being and doing, their perceptions and representations, in a quest for meaning specific to the discipline (Ingold, 2024).

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Finally, by highlighting the diversity of relationships with the world and the environment and their interdependence, anthropological research shows that local knowledge contains ways of understanding human or animal diseases, including the state of health of ecosystems. We can assume that by documenting and restoring this knowledge in its context and in action, it can be considered as a real resource for thinking about the status and emergence of diseases. Interestingly, the 2022–2026 One Health Joint Plan of Action report and the One Health definition provides by OHHLEP both calls for the integration of anthropological and participatory research to better understand key risky behaviours, assess the acceptance and feasibility of risk mitigation strategies, and identify suitable alternatives—emphasizing the importance of gender-sensitive approaches and the inclusion of Indigenous Peoples' knowledge (FAO, UNEP, WHO, and WOAH, 2022; OHHLEP, 2022). However the challenge remains how it can be implemented with diverse contextual considerations when the mitigation measures always tend to take a fire fighting strategy (WHO 2022).

We have just seen what local knowledge is made of and have shown how with its methodological tools and its approach, anthropology is able to restore it. The final section will allow us to reflect on how to integrate the practical experience of populations daily engaged with animals and their environment to better mobilize them in a One Health approach, in support of experiences and original research approaches in progress.

4. Putting knowledge into networks

Mobilizing local knowledge is not something new in itself. In terms of conservation or resource management, there are numerous attempts at hybridization or interweaving of local knowledge with scientific knowledge. However, this way of integrating local knowledge into scientific research often leads to a form of rationalization and partly to an erasure of knowledge from communities (Ludwig & Poliseli, 2018; Root-Bernstein et al., 2023). As we have seen, the latter in fact lose part or all of their essence when they are translated, transformed or used outside their cultural and social context of production. Thus, rather than seeking to hybridize scientific knowledge and local knowledge in an operation that would freeze the latter, in order to protect from any risk of instrumentalization, we would rather advocate considering local knowledge holders as research partners.

In short, it would be a question of networking knowledge since there are as many epistemologies, as there are disciplines, and world views and finally, as regards the One Health approach, there are multiple ways of thinking about illnesses and health. Such networking perspective overtakes what anthropologist Manuela Carneiro da Cunha (2012)

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suggested more than 10 years ago about the conservation of biodiversity. Pointing out the weight of the asymmetry of knowledge and the risks of transformation, instrumentalization or even of dissolution of local knowledge when it is mobilized by scientists, she suggest to “setting up networks that make them partners and interlocutors in their own right' (da Cunha, 2012).

The interest in networking knowledge is to bring out all the available knowledge, to make it visible and shareable with each stakeholder engaged in a specific situation, while each retaining their own logic and epistemology. Keeping the concern to preserve their own integrity, the objective is precisely not to merge them with each other, but rather to obtain a multiple, enlarged vision of a situation of which all the members are the co-owners. Each of the knowledge systems that form part of a network is then considered to be complementary to the others, taking into account their points of convergence and/or divergence. It moves towards a mutual understanding of a given situation. This review of points of view and perspectives based on all available knowledge does not consider *a priori* any system of knowledge as superior to the others, but each as valid. At the same time, this networking facilitates dialogue. It promotes the emergence of new forms of knowledge construction based on collaboration between different knowledge holders, and continually invites them to learn from each other and co-learn their respective knowledge.

Within each network, dialogue can thus be understood as a process of mutual learning, bringing together communities and stakeholders with multiple points of view. Such dialogue can also offer possibilities for legitimizing certain forms of knowledge, requalifying local communities and their voice in the decision making process. We know in fact that knowledge is shaped and transformed at the time of decision-making and, in the scientific field, it is stabilized at the time of producing results (Crespin and Henry, 2015).

In this way, local communities are no longer reduced to simple providers of information or data for scientists, as we can sometimes see in the context of participatory research or citizen science. If such an approach is greatly useful because it allows acquiring a large body of knowledge, paradoxically, this way of mobilizing citizens goes against the proposals to work in an inclusive and intersectoral manner as suggested by One Health. Often the role of lay knowledge stops there and is no longer consulted when the results are produced and disseminated. On the contrary, a networking of perspectives and knowledge fully integrates communities and their knowledge into the process of research and knowledge production.

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As we can see, putting knowledge into networks aims to establish a unique image of a given situation or context, jointly constructed by all the actors involved on the basis of their complementarity. This image can then serve as a starting point for an in-depth analysis of the situation by addressing common challenges.

Conducted in Thailand, the BufFarm project is a successful example of knowledge networking. The project explores buffalo farming among the Lua community in Nan province, emphasizing their extensive livestock practices aligned with the agricultural calendar. Lua farmers rotate buffaloes between village rice fields post-harvest and community forests during monsoon rice planting. The project adopts a One Health perspective, integrating anthropology, ecology, and molecular biology to study buffalo care, environmental impacts, and microbial dynamics. Anthropology led the project by conducting ethnographic research into Lua buffalo-rearing practices, ethno-veterinary techniques, and interpretations of disease transmission. Collaborative ethnography engaged breeders as co-knowledge contributors, revealing their pluralistic approach to animal health, blending local and biomedical practices (Lainé et al., 2023). The BufFarm project advanced knowledge perspectives beyond ethics and equity, reinforcing the importance of recognizing local knowledge, its dynamic character, and its role in addressing contemporary challenges for the local community.

Researchers from different disciplines participated in immersive fieldwork, facilitating interdisciplinary collaboration and aligning scientific hypotheses with local practices. This approach fostered shared investigations rather than isolated disciplinary questions, bridging local and scientific knowledge. The project highlights the value of integrating Indigenous expertise to enhance the understanding of livestock systems and ecological health.

Conclusion: The need to relocate One Health and to address its Multiple

The COVID-19 pandemic has brutally reminded us that in our globalized epidemiological environment (Morand, 2016) addressing the risks linked to human, animal and environmental health is a necessity. It brought to the forefront the One Health approach which integrates these three components into a single approach. If we want the One Health approach to be concretely implemented, it is first a question of reflecting on health knowledge and opening it up to other forms of knowledge (be it human or even non-human animal forms of knowledge). In fact, responding today to the inclusive and multisectoral aim, which

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constitutes one of the pillars of the official definition of One Health, involves thinking about the decolonization of health knowledge (Lainé and Morand, 2020). Such reflection requires moving away from ethnocentrism in favour of modern science in order to include other forms of knowledge, in particular those possessed by local communities. Of course it is not a question of idealizing local knowledge, but of recognizing its value and integrating it sensitively, while acknowledging its context-dependence as well as the situated, overlapping nature of the multiple bodies of knowledge involved.

For this, the mobilization of anthropology takes on its full meaning. Ethnographic surveys make it possible to highlight local particularities and appropriate solutions. These solutions are built on a case-by-case basis, taking into account all the perspectives of a given context, adapting them and working *with* the local communities.

While there is undoubtedly no single way to engage in a One Health approach, the inclusion and consideration of different knowledge regimes throughout the research process must be a prerequisite. This is not only to put One Health into practice but also to guarantee the fair, ethical, and dynamic process of decision-making and knowledge production within the community. This will be perceived by the communities not as something imposed on them but as a process in which they will have participated at all levels.

Generally as a researcher, whatever the discipline we belong to, engaging in a One Health approach invites us to question our own scientific practice, to (re)think about how to produce knowledge. One Health thus emerges as an opportunity to reconfigure science by engaging more deeply with local communities and their knowledge, fostering greater equity in both societal relations and knowledge production.

Data availability statement

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Author contribution

NL: Conceptualization, visualization, writing – original draft, and writing – review and editing; UP: writing – original draft and writing – review and editing

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