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# Knowing Nature in Africa

## Introduction to the Special Issue

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At a time when ecological crises are increasingly severe and when information about them is being more widely and rapidly disseminated at the global scale, Africa would seem to be particularly impacted. This is evidenced by the surge in extreme hydro-climatic phenomena (e.g. drought, flooding, storms) and ecological disasters (major wildfires) over the past few years. On the African continent, people experience such climatic changes in varying degrees in their everyday lives. In this context, Africa is a territory that has contributed to a high level of knowledge production about issues related to nature and/or the environment,<sup>1</sup> although information about this knowledge circulates in an uneven manner on the local, regional and global scales. This knowledge is contained in a wide spectrum of objects, documents and tools: they range from maps and geographical information systems (GIS) to botanical collections and to the collection of naturalist knowledge and classification systems identified as “indigenous knowledge”; and from numerical results—sometimes presented on maps or other graphics—related to biodiversity and natural resources, to legislation concerning the environment and to leaflets and prospectuses of various formats. The formalisation and valorisation of knowledge and data about the environment goes along with the expansion of extractivist interventions and the exploitation of resources on the continent. It is also accompanied by the proliferation

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1. “Nature” and “environment” (as well as the French notion of *milieu* (Feuerhahn 2017)) are notions which are sometimes used as synonyms but do in fact hold different meanings and histories. The word *environnement* was actually introduced in France during the second half of the 20th century as a French equivalent to *milieu* (*ibid.*, 31). Its meaning was defined during the 1970s as “the whole of the physical, chemical and biological agents and social factors likely to have a direct or indirect effect, immediate or in due course, on living beings and human activities” (Charvolin 2003, 20). However, this understanding has been criticised for its naturalistic and determinist dimensions. This explains why certain researchers, such as Bruno Latour (1999) and Philippe Descola (2005), preferred to revert to the notion of “nature”. By setting aside any hint of either naturalism or culturalism, their aim was to challenge the “great divide” between Nature and Culture, that was specific to Western “naturalist” thought (Demeulenaere 2017). We shall use both terms here as a basis for dealing with nature / environment both as a historical, social and cultural construct, and as an ensemble of living organisms possessing tangible physical, biological and ecological properties (Stengers 2019, 34-35).

of projects aimed at the protection of ecosystems and biodiversity by certain institutions, initially colonial ones, then national or international, or more recently projects supported by health or food development programmes. Finally, it follows the growing urbanisation and expansion of tourism—considered in the spheres of planning or conservation as activities whose impact is at times damaging, and at others conducive to protection—as well as the development of technical innovations in environmental research and communication.

In this context, the present special issue places knowledge of the environment and nature in Africa at the centre of the debate: what is considered as deriving from knowledge or from ignorance about environmental issues? How, by whom and for whom is this knowledge produced? What purpose does it serve? In what manner and by what means does it circulate? Who is considered an expert? And how are epistemological hierarchies constructed and how do they conflict with each other in relation to the environment in Africa?

The originality of this special issue lies in its approach, as it looks at the ways in which the knowledge of the environment is contained in diverse tools and materials: soil core samples, minutes of environmentalist association meetings, legislation documents, international protocols, tourism prospectuses or information brochures for health campaigns are among examples that demonstrate how objects may become “places” of knowledge (Kaine 2002). Once collected, classified and (re)contextualised, these tools and materials become sources of analysis for social science research about the environment in Africa. These sources are interesting in that they act as building blocks and stabilising objects for regimes of knowledge—regimes of knowledge that might otherwise be unstable and scattered. Therefore, such sources are a venue to both trace the circulation and clashes of ideas and of different modes of knowledge, and to underscore the asymmetrical power relations that might be at play in specific instances.

The six articles and the interview in this dossier focus either on a single source or on a corpus of sources pertaining to nature in Africa, examining the actions, words and material context of “those in the know”: the experts and the scientists (Latour 1987, 32). On the basis of these research materials, the contributors analyse the construction and circulation of knowledge about the environment; they also explore the regimes of truth, of scientific validity and of ignorance that produce knowledge hierarchies. To that end, they scrutinize their sources as objects that embody economic interests, power dynamics and imaginaries of alterity that are specific to Africa today and in the past.

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In focusing here on the making of knowledge, we aim in this introduction to start with an insight on how this special issue came to being. This enables us to discuss the trans-nationalisation of knowledge about the environment in Africa, and to underscore inequalities affecting knowledge production. We then present four themes which are crosscutting within the six articles and the interview. Firstly,

we highlight how the processes through which the environment is conceptualised create spaces for specific interactions. Secondly, we show that this knowledge about the environment and the objects in which it is carried result from processes of objectivation, processes which also bear dimensions of affects, aesthetics, sensibilities and identities. We conclude by discussing the processes of knowledge production about nature in Africa within the social sciences.

## Transnationalisation and Inequalities in Knowledge Production about Environmental Issues in Africa

The call for contributions to this issue, launched at the end of 2019, met with considerable success: we received twenty-seven abstracts for articles. Most of them were submitted by young researchers of different nationalities, coming from various disciplines and working in diverse places. Many of these proposals were collective texts derived from interdisciplinary projects. They focused on a wide range of themes ranging from ecological disasters or ecotourism to the management of forestry resources, or the study of museum objects as vectors of knowledge about nature, or even the study of waste and water resource management. The wide response to this call confirms the central position of environmental issues in the humanities and social sciences in Africa. It also more crucially highlights the need for debate among researchers about the social and political dimensions of modes of knowledge production about nature in Africa.

The responses to the call for contributions are of course not representative of all the social sciences research on the environment in Africa, but they provide a basis for consolidating or adding nuance to certain findings and observations as well as for raising further questions.

It should first be underlined that most of these proposals were related to international projects focused on development or the management of emergencies and crises. Some of them also provided historical analysis of environmental management by colonial institutions. The significant position of international projects about African environments in defining research subjects in the social sciences must be seen in relation to changes of theoretical and methodological paradigms in the environmental sciences. The protocols for description and cataloguing practices by individual or by species have given way to mass counting (Charvolin 2004), gradually refocusing the analysis towards understanding more systemic phenomena. In terms of images, for example, there has been a shift from plates and etchings describing representative individuals of each species to models of population distributions or to predictive scenarios of their evolution (Gaudreau et al. 2015; Chansigaud 2007). Thus, from the 1970s on, international organisations such as the International Union for the Protection of Nature (now IUCN, the International Union for the Conservation of Nature), the United Nations Environment Programme (UNEP) or the World Wide Fund for Nature (WWF, ex-World Wildlife Fund) aimed to attain an increasingly global understanding of the environment and of species taking into account stocks

(population management and demographic studies) and the dynamics of migration. The transformation of these research methods and protocols is indicative of the shift from an approach that was protectionist of nature towards a more management-focused and global approach (Pinton 2014), requiring the construction of transnational and shared knowledge. However, these technical advances were not evenly distributed throughout the African continent; they gave rise to or reinforced the asymmetrical relations of power between the regimes of knowledge at play.

Thus, the focus on situations relating to the internationalisation of research and to nature management by the social sciences follows a broader internationalisation of scientific activities which, without being exclusive to the African continent, affects it vividly and tends to reinforce inequalities and intercontinental epistemological hierarchies. In turn, this focus also concerns the current economy of social sciences research, which to some extent follows the agenda of the international institutions for crisis management, the conservation of nature and sustainable development.

However, this observation raises the question of the limits of internationalisation: are there in Africa spaces of production and circulation of environmental knowledge which are not affected by the dynamics of internationalisation? The question may well be rhetorical and the answer clearly affirmative, but numerous research projects have yet to be undertaken to better understand the ways in which knowledge about nature in Africa by Africans themselves is produced and the places of its production, and without these being necessarily in conflict with exogenous practices and modes of knowledge.

Apart from the international dimension of the projects that many of the proposals received aimed to describe, and sometimes analyse, it is important to highlight an almost systematic emphasis within these research projects on “sustainable development” or the management of ecological emergencies and crises in Africa—or even their resolution. While this emphasis is of course related to the intensification and acceleration of environmental degradation, notably in Africa, it is also evidence of an earlier and still influential theoretical orientation in the perception of the relationships to nature within the humanities and social sciences on the African continent. This orientation is the fruit of a “developmentalist” tradition initially mapped out during the colonial period and which was reasserted in post-independence contexts through the framework of technical cooperation which formed the bulk of the then major development programmes funded by international agencies such as the *Agence Française de Développement* (AFD). It strongly drives knowledge production on local relations with nature towards the rapid provision of easily applicable “recommendations” and “solutions” (Jacob 2000). This drive for “applicability,” and today for “sustainability”<sup>2</sup> in social sciences research on nature also strongly permeates the training of students and young researchers in this field, notably on the African continent. One might then question, as many who have preceded us have done (Olivier de Sardan 2021), the limits of the knowledge acquired

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2. For example, “*La science de la durabilité à l’IRD*”: <https://www.ird.fr/sciencedeladurabilite>, consulted 19 May 2022 [archive].

about perceptions of nature and relations to it in Africa which are raised by this “developmentalist” and “sustainability-ist” orientation within the humanities and social sciences research, both in terms of the topics selected, the research methods adopted and the results obtained.

The responses to the call for contributions equally offer evidence on the small number of major research projects about the environment in Africa, in comparison to other regions of the world. They testify to the scarce scientific production of researchers in Africa on the whole in relation to this theme, or to say the least, on the basis of a bibliometric approach, as contested though it might be (Eckert et al. 2018). The reasons for this state of affairs are many, of a diverse nature, and vary according to regions, countries, cities and even institutions. They are related both to institutional aspects (robustness and structure of the scientific community, credibility of the scientific institutions), economic aspects (state policy for research funding, access to international funding), and historical aspects (international cooperation), as pointed out by Waast and Gaillard (2018). But this situation is also linked to the way scientific knowledge is constructed, validated and transmitted, and to the measurement tools deployed in its production. Furthermore, scientific production in Africa appears to be highly segmented, varying according to the discipline: while it is highly developed in certain African countries, such as South Africa, Egypt and the English-speaking countries in the Gulf of Guinea (Eckert et al. 2018; Losego 2008; Waast and Gaillard 2018), other countries are virtually absent from the statistics assessing global scientific production. In addition, the collection of data about the environment destined to supply national, regional or global data bases remains a difficult if not impossible task in many regions of Africa. It should be also noted that the cartography of the bibliometrics on the continent cannot be entirely superimposed on that of the national economies,<sup>3</sup> such as those of certain intensively monitored ecosystems in Africa (the deltas of Sine-Saloum and of the Nile, the inner delta of the River Niger, the basins of Lakes Chad and Fitri, the tropical forests of the Congo basin, among others), or that of international environmental projects.

## The Sources of Environmental Knowledge in Africa: Actors, Norms, and Power Relations

The lines of thought developed by the contributors focus above all on their choices of sources and their access according to the research topics, the development of protocols for the collection of data, the reification of so-called “local,” “indigenous” or “non-expert” knowledge, the instrumentalisation of environmental issues, the geopolitics and the democratisation of knowledge, and the conceptualisation of the “made in Africa” environment. The interview, on its side, focuses on drawing and

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3. One might also note that scientific production is not directly linked to the wealth of a country: the GDP per inhabitant fluctuates and the number of publications counted by country in Africa are not correlated, and it would seem that the scientific production represents a longstanding State policy more than anything else (Waast and Gaillard 2018, 73).

photography as research tools and on the different ways of diffusing the knowledge produced by the social sciences.

Dealing with various countries (Madagascar, Mozambique, Ethiopia, Kenya, Sudan, Guinea, Sierra Leone, Nigeria, Cameroun) at different periods and in various contexts, the articles and the interview tackle common themes which will be outlined here: the relational dimension of the study of the living world, the processes of the normativisation of knowledge about nature, and the balance and dynamics of power inherent in producing knowledge about the environment in Africa through the prism of the humanities and social sciences.

### Thinking Nature, Imagining the Living World: the Conceptualisation of the Environment as a Space for Interaction

Thinking the environment is not only a question of discourse, practices and artefacts, but also a matter of relationships. The different ways of conceptualising nature that emerge from the texts in the present special issue are embedded in the personal or institutional interactions that play out at very different scales.

Firstly, the interview conducted by Luisa Arango with the anthropologists Céline Lesourd and Émilie Guitard and the artists Nicolas Deleau, Delphine Chevalme and Élodie Chevalme shows that using artistic media, such as drawing or photography in the field to investigate relationships to nature in Africa cannot preclude taking into account the collaborative methods bringing together the arts and sciences within the academic sphere and how they are perceived. The choice of co-producing knowledge with artists or the recourse to “creative” methods of investigation in field surveys inevitably raises numerous questions in terms of career impact and in terms of the recognition of the legitimacy of these very specific forms of writing research by peers and by scientific institutions.

On another level, Manohisoa Rakotondrabe and Fabien Girard on one hand, and Emmanuelle Roth and Nelly Leblond on the other, emphasise the key role that African expert intermediaries play in projects related to the environment in Africa. The first two articles revisit the classical figure of the “development broker” described and analysed since the 1990s (Long and Long 1992; Lewis and Mosse 2006) and the pioneering work of Jean-Pierre Olivier de Sardan (1995). In contrast, the article by Nelly Leblond presents a less frequently studied perspective: that of the African academic working in a public sector research institution and contributing to the training of African students and to the transmission of models of knowledge and research about the environment.<sup>4</sup> Michel, the young veterinarian working for the PREDICT project in Guinea, Enoch, who is professor of soil science at the Catholic University of Mozambique, and the facilitator of *Natural Justice*, who is the provider for the Darwin project in Madagascar, each in their way show the increasingly

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4. For some discussion about this subject, see the article by Michèle Berthelot (2008) on the *Programme de Formation-Information pour l'Environnement* in Senegal, or that by Melissa Leach and James Fairhead (2002) on citizen science in Africa and the Caribbean.



complex, multi-sited and hierarchical institutional interactions within which their work is embedded. By analysing the relational and institutional spaces, the three texts equally highlight the arrangements between the actors involved and objects that might be referred to as “frontier-objects” or “intermediary-objects” (Vinck 2009; Star and Griesemer 1989). Biocultural protocols, information brochures or soil cores possess this “interpretive flexibility” which enables them to become heterogeneous translation supporting tools, devices for the integration of knowledge, and mediators between experts and non-experts (Trompette and Vinck 2009, 5).

The three authors thus show how the intermediary actors adapt, translate and readjust knowledge—but also environmental ignorance—within their contexts of action, whether to avoid conflicts that might directly involve them (Roth), to produce knowledge in line with their deep convictions about the importance of the role of local populations and environmental resources (Rakotondrabe and Girard), or to adapt European protocols for the collection of samples to the local context (Leblond). By showing the potential and the limitations of these frontier objects in these mediated interactions the authors confirm the importance of an analysis of the sources to highlight the relations that the actors involved maintain with each other, with these artefacts of knowledge and with their surrounding environments.

Still from a relational perspective and in relation to the treatment of the environment in Africa, the articles by Gaële Rouillé-Kielo and by Guillaume Blanc equally present two points in common, this time in a historical register. On the one hand, the archives that they use for the analysis reveal behind-the-scenes relationships in the programmes for the management and protection of nature in Kenya and in Ethiopia. Even if these programmes are not directly linked to environmental questions, they have an impact on ways to manage and conceptualise the environment: conflicts over the payment of wages, friction between international experts and local administrators at the dawn of independence, cooptation of international managers within a closed circle of acquaintances) (Blanc), or even disagreements that become personal between the farmers and the associations of residents’ living on the shore of Lake Naivasha in Kenya (Rouillé-Kielo), all shape the actions of institutions and people concerning nature.

On the other hand, the two authors use archives produced during the era of independence in Africa. In doing so, they interrogate institutional and personal relations in a context of colonial disintegration. Their articles trace the genealogy of the institutions which are examined and follow the continuities or the disruptions that inform different ways of thinking about and dealing with nature in Africa. Conservationists, preservationists, declinists or extractivists assert themselves, intermingle or engage in conflict to give a specific orientation to the management of African ecosystems.

In this way, the authors show that as regards the management of nature and the living world in Africa, decolonisation does not necessarily result in a drastic alteration of the pre-existing balances of power. In fact the new African administrators enacted

a reversal of hierarchies relative to administrative issues concerning the management of the national parks (Blanc). But the ways of perceiving and understanding nature in the African continent do not seem to have been called into question, while the legitimacy of knowledge about African environments, produced by international experts, does not seem to have been contested.

Some articles in the present issue also question the processes of reification that “local populations” or “communities” are subjected to. Various stakeholders in the study and the management of the environment (administrators, conservation agents, local associations but also sometimes researchers themselves) frequently (re)present these “local populations” or “communities” as monolithic blocs with practices and knowledge that are homogeneous and frozen in time. The research by Manohisoa Rakotondrabe and Fabien Girard makes it apparent that the knowledge and practices of different *fokontany* (municipalities in Madagascar) are presented in the Biocultural Protocol under the different labels such as “traditional,” “ancient,” “immemorial” and even “ancestral,” and that they are framed as still being rooted in systems of belief that are immutable and closed in on themselves. By failing to account for the economic and political conflicts within the *fokontany*, as well as the disagreements regarding the categorisation of diverse seeds, during the drafting of the Biocultural Protocol, this document bypasses the conflictual relationships specific to communities and individuals exhibiting dynamic and changing knowledge patterns.

For their part, Nelly Leblond (on the under-exploitation of land in the Northern Mozambique region), Guillaume Blanc (on the deforestation of the Simien mountains in Ethiopia) and Corten Pérez-Houis (on the pollution of soil and air in Khartoum) all demonstrate, with considerable finesse, how practices related to the environment—which are in these three case studies more imagined than real—are presented as either resolutely harmful, or absolutely beneficial in ecological terms. Yet despite being binary explanations, these ways of seeing neglect many cases of power struggles and relations of inequality in the ways in which environmental knowledge is being used by individuals, local communities, locally based scientists and international researchers. Simultaneously, they conceal the instrumentalisation of different kinds of knowledge for economic gain, in particular the appropriation of land (Leblond and Perez-Houis) and State control over an insurgent territory (Blanc).

One must say that the analysis of inter- and intra- epistemic communities by the social sciences is not always straightforward: face-to-face interactions between these communities are not so frequent and researchers do not always have access to the various stakeholders involved in such exchanges. So while it might be falsely considered that the stumbling blocks related to the reification of “communities” (either local, epistemic, or international) are a thing of the past in academic circles, in reality there remains a considerable amount of work to be done in order to deconstruct stereotypes and information. This work is important, in the face of international programmes for the management of biodiversity or public conservation policy that are based on a classical model of knowledge transfer from “scholarly knowledge”

(scientific, expert or academic) towards “non-expert knowledge” (practical or popular) (Steyart 2006). As illustrated in the articles by Roth, Perez-Houis, Blanc, Rakotondrabe and Girard, it is mainly within the framework of environmental or health regulations, intended to induce changes in local practices, that notions such as “native” or “indigenous” environmental knowledge emerge. While these notions may have played a role in highlighting the recognition and respect for diverse forms of knowledge (Baronnet and Melenotte 2020; Bellier 2013), they nonetheless still continue to contribute to reinforcing an “epistemological break” which generates a distinction, or even a hierarchy, between scientific knowledge and “other forms of knowledge,” without examining the material and historical roots that have forged such distinctions (Latour 1987). These categorisations have been the subject of widespread debate about the over simplifying instrumentalisation of vernacular typologies (Roué 2012; Roy et al. 2000). It is also necessary, in the interests of thorough field research in the social sciences, to continue to deconstruct the essentialist readings of how African societies relate to their environment. This is a relevant task, whether it is expressed in a critical mode, as was the case during the colonial period and is still the case in the contemporary era in many conservation or sustainable development projects imposed on a top-down basis; or whether it is expressed in a more romantic mode as the perfect solution to the crisis of relations with the living world which currently characterizes Western societies.<sup>5</sup>

### Identity, Materiality and Affect in the Normativisation of Knowledge about the Living World

Five of the six articles in the present issue are based on normative type texts which are used as principal sources of analysis (Blanc, Girard and Rakotondrabe, Perez-Houis, Rouillé-Kielo, Roth). The use of such types of sources reflect the normativisation of practices pertaining to the environment and resources, which has been under way since at least the 1960s in Africa. This process challenges the researchers to engage with an increasing demand for the codification of local knowledge, at a time when such a knowledge is acquiring new social and economic value (Moity-Maïzy 2011).

In this normative context certain documents serve as tools for planning and management of diverse products of the environment. These include: letters that recommend the eviction of populations from the Simien national parks (Ethiopia); the Biocultural Protocol intended to frame the negotiation of the use of seeds by the municipality of Analavory (Madagascar) with potential international prospectors; laws on the production of bricks in Khartoum; plans for the eradication of the water hyacinth at Lake Naivasha (Kenya); and the “bat book” defining good practices for interacting with bats in different countries in Africa and Asia within the framework of the spread of zoonotic diseases. Such documents point to the animal and plant

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5. See for example the day devoted to a new “animist humanism,” presented as “African,” as part of the festival *Agir pour le Vivant* held at Arles in 2021: *Dessiner un nouvel humanisme*, <https://www.agirpourlevivant.fr/mercredi25août>, consulted 31 January 2022 [archive].

species that need to be eradicated or protected in a given ecosystem, and more broadly to the ways of dealing with nature which are to be either promoted or discarded.

In these articles, the analysis of textual sources and their usage reveals a discrepancy between the practices and complex knowledge in the field and what the texts which are used as sources show: it is indeed difficult to get a clear vision of ever-shifting knowledge and practices, which are often transmitted orally and which have been very rarely codified in the past (Bannister 2009). However, the aim is not so much to focus on the discrepancy—already clearly identified in the literature (Mitchell 2002)—as it is to highlight its high potential in accounting for the dynamics at work in scientific communication and in the processes of codification of environmental knowledge in Africa. The expression of social distinctions, but also identities and alterity related to knowledge, the materiality of ecosystems and the contribution of affects and sensibilities are all factors that play a role in these processes. The interview carried out with Céline Lesourd, Nicolas Deleau, Émilie Guitard, Delphine and Élodie Chevalme do stress, in particular and from a critical perspective, the contrast between an alleged scientific objectivity and an admitted artistic subjectivity, as well as underscore the place attributed to feelings and affects in research and in the transmission of research results.

The articles by Nelly Leblond and by Emmanuelle Roth show how certain objects (soil cores, and information brochures respectively) actualise already prominent social distinctions between peasant farmers and the educated urban elite in Mozambique and in Sierra Leone. These two examples confirm that the commitment of actors to the conceptualisation of the environment contributes to the construction of identities and alterity, of possible oppositions and alliances (Callon 2006). Thus, in both cases, to adhere or to identify an individual to a given regime of knowledge, with all the associated social markers (such as driving a 4 x 4 vehicle or communicating in English) signifies attaching oneself or attaching someone to an epistemic community, however diffuse it might be. Thus, the authors engage a debate about the power relations between knowledge regimes emanating from different communities of knowledge, communities that are increasingly being called upon to collaborate in Africa and to play a role in the global discussions on the mitigation of the current ecological crisis (Jankowski 2013; Gowing et al. 2004; Viard-Crétat 2016).

Manohisoa Rakotondrabe and Fabien Girard analyse the different scripts that underpin a Biocultural Protocol developed in Madagascar. Chosen for its ease of access and on the basis of the technical development goals defined by the government of Madagascar, the municipality of Analavory, the leading actor in the project, is in reality poor in phytogenetic resources and will most likely not be in a position to take part in the inter-municipal programme for the exchange of seeds envisaged in the initial plan. Here, the material reality of the ecosystems is hindering the texts and the participative discourse used by the international agencies, while revealing the contradictions between the actors. In contrast, Nelly Leblond analyses a significantly different kind of material limitation. She describes the constraints encountered in

carrying out a soil analysis in Northern Mozambique in accordance to the norms agreed upon by international institutions. Old instruments and difficulties in transporting the samples coupled with the weakness of international cooperation, rivalry between private national institutions within scientific research and the suspicion of local farmers vis-à-vis the research carried out all attest to the crucial position of the political economy at the core of environmental research in Africa.

The articles in the present issue also shed light on the role of affect and sensibilities within processes of normativisation of knowledge about nature in Africa. Emmanuelle Roth explains how the public awareness outreach campaign she studied strongly focused on the distaste of the local populations for the consumption of an animal considered as repugnant: the bat, while ignoring a range of other forms of contact with the animal and its excretions which could potentially be equally dangerous. Corten Perez-Houis shows how olfactory disturbances, among other types of disagreeable phenomena, serve as an argument for invalidating the production of mud bricks in Khartoum in favour of cement bricks, without any studies that would convincingly demonstrate that the production of cement bricks would be any less polluting. Similarly, Gaële Rouillé-Kielo describes how the vague idea of what the “natural” environment of Lake Naivasha might resemble conflicts with, or even excludes, knowledge and practices linked, for example, to the production of flowers for export. Finally, Guillaume Blanc draws attention to recurrent emphasis on the picturesque dimensions of the site of Simien National Park in tourism brochures: the beauty, the magnificence and the unique character of the landscapes and the species are widely deployed as motivations and justifications to act directly on the ecosystems and encourage the eviction of the park inhabitants. The sources used by these four authors form part of a generalised normativisation, and are embedded in direct or indirect forms of aesthetic and sensory socialisations pertaining to visual perceptions (Blanc and Rouillé-Kielo), of the sense of smell (Perez-Houis) and of the taste/distaste (Roth). Yet we know that these processes are the fruit of forms of social engineering, often non-institutionalised (Law and Lynch 1988; Sicard 1998), contributing to the drafting of recommendations about the treatment of the environment which might actually simplify, invalidate or discredit certain forms of knowledge or practices.

In this respect, the interview based on collaboration between the anthropologists Céline Lesourd and Émilie Guitard, the artists Nicolas Deleau and the Chevalme sisters sheds light on a current trend that promotes collaborative work between the arts and the sciences. Such a collaborative work particularly makes it possible to capture and render the sensible and affective ways in which one may relate to nature. Delphine and Élodie Chevalme and Émilie Guitard, for example, highlight the capacity of drawing or photography to expose the role of the vegetal element in the “urban atmosphere,” which written ethnographic description cannot always fully capture and transmit to the reader. Similarly, Céline Lesourd and Nicolas Deleau have used their collaboration in Sudan to deconstruct, in the form of a comic book, clichés about the global circuits of the marketing of khat.

These semiological (perception) and phenomenological (experience) approaches, dealing with the aesthetic and sensory dimensions of certain sources and research procedures, equally inform us about the place of affects and of attachments that may be generated by environmental issues, in this case in Africa.

### Knowledge from the Humanities and the Social Sciences about the Environment in Africa

Some of the contributors have been faced with constraints about making public the sources they are using in their research. These include survey protocols (Leblond) or documents produced by national institutions (Perez-Houis) and international ones<sup>6</sup> (Roth, Rakotondrabe). In the first case, the procedure for soil coring was mainly associated, by farmers' collectives, with the processes of land seizures in Northern Mozambique, whereas in the second case, the reports of field surveys on the brick factories by agents of the High Council for the Environment in Sudan, since they were potentially confidential, risked compromising interlocutors in the field. Finally, in the case of documents produced by international institutions (even though these documents were accessible to the general public), their inclusion in a scientific paper potentially contesting their modes of production and usage risked spoiling the sometimes fragile relations constructed by the researchers with members and/or beneficiaries of these institutions in the field. While this question was not tackled as a central issue by any of the authors in their articles, they all pointed to possible or actual controversy, real or perceived, affecting their direct or indirect interlocutors in the course of their research. Controversies of this kind in social sciences research on expert knowledge have been documented and show for example how conflicts over professional identities may lead to the researcher's analysis being contested, or even made impossible to achieve (Mosse 2011, 19). The reasons for these controversies are of course many and specific to each investigation, each institution and to the kinds of relations that each researcher establishes in the field. One might here nonetheless outline a few guidelines for reflecting about this issue.

The four afore-mentioned studies are caught up in the "methodological dilemma," whereby researchers in the social sciences or humanities attempt to integrate other regimes of expertise within their own field (Boyer 2008). They thus illustrate how the social sciences on the environment in Africa claim in a certain way to assess or encompass other forms of knowledge (scientific, vernacular, institutional, etc.). In this sense, they are often seen as competing with them, criticising them or even invalidating them. However, less attention has been given to the role of researchers in the social sciences and the humanities as producers of knowledge on the environment in Africa, their role in the worlds of expert knowledge (scientific or from international institutions) that they spent time with, the relations they form with these worlds and the effects of proximity to and epistemological distance

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6. It is noteworthy that the question of the publication of sources presented no difficulties for the two historical studies (Blanc and Rouillé-Kielo).

from them. Proximity in the sense that the social sciences, like development actors, are primarily concerned with categorisation and the social order (Green 2011) and because they share with the sciences of the environment the same interest for scientific validation. Distance because the social sciences question the social categories and attempt to make their meaning explicit, while development actors aim to alter the social order (Green 2011).

This line of questioning confirms the political dimension of environmental knowledge in Africa and shows that the knowledge produced by the social sciences is also caught up in power dynamics. These studies do not position themselves outside the situations they present; rather they become an integrated stakeholder to engage in a “relation of epistemic jurisdiction” (Boyer 2008) with other experts who aim to produce knowledge about the environment in Africa. This is an invitation not only to contextualise references to nature both geographically and historically within our fields, but to equally reflect on individual pathways and situated knowledge, enabling us to question our epistemological positioning. For us as researchers, it is thus indispensable to consider, in our analyses, how we relate to the regimes of knowledge that are referenced and used by our interlocutors (whether farmers, members of the forces deployed in enforcing the environmental legislation, researchers and academics or agents of international projects related to the environment, and whether African or from other continents) and that are prevalent in the institutions we are studying (Stehr 2000).

Finally, it is important to raise the question, in the context of research in the humanities and social sciences, about the modes of criticism pertaining to knowledge production by the environmental sciences in and about Africa. At a time when the degradation of the ecosystems on the continent is palpable and when the environmental crises are increasingly visible, the catastrophist or even declinist discourse about the African continent is widely broadcast in conservationist spheres and through the international media. Yet this discourse, which presents dramatic images of the degradation of African ecosystems over the decades, is not always well-founded as actual ecological transformations of the environment show. For instance, the article by Guillaume Blanc testifies that the populations of *walia ibex* in the Simien National Park in Ethiopia have been continuously growing, despite the regular declarations about their decline; and the article by Gaële Rouillé-Kielo shows that the eutrophisation and drying up of Lake Naivasha in Kenya did not occur in the 2000s, as had been predicted in reports since the 1970s. Furthermore, this discourse may be instrumentalised to serve various economic and political interests. Major hydraulic works, involving the transfer of large volumes of water over vast distances to mitigate the risk of drought, are an example of the instrumentalisation of hydro-climatic risks for political and economic purposes (Blanchon and Maupin 2009; Magrin 2016). The difficulties in applying the Paris Agreements to fight climate change also raise the question about why mitigation measures pertaining to climate change have been abandoned in favour of injunctions that stress the need for populations to adapt and to modify their use of environmental resources as well as

their relations to them. In this context, researchers in the humanities and the social sciences are faced with the necessity of developing competencies in epistemological diplomacy (Latour 2012; de Vienne and Nahum-Claudiel 2020). It is their task to explore and depict the complexity of the social and political relations at play within the situations they are studying, in a constructive approach which might contribute to global discussions about the mitigation of the effects of the current ecological crisis, notably from the African continent.

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