Journal des anthropologues

Association française des anthropologues

132-133 | 2013

Anthropologie et eau(x)

Literacy, translation, practices

Groundwater location under stress in South Kordofan (Republic of Sudan)

Aptitude, traduction, pratiques : la localisation de l'eau de nappe sous stress dans le Sud Kordofan (République du Soudan)

Enrico Ille

Electronic version

URL: <http://journals.openedition.org/jda/4963>

DOI: 10.4000/jda.4963

ISSN: 2114-2203

Publisher

Association française des anthropologues

Printed version

Date of publication: 8 July 2013

Number of pages: 219-242

ISBN: 979-10-90923-05-8

ISSN: 1156-0428

Electronic reference

Enrico Ille, « Literacy, translation, practices », *Journal des anthropologues* [Online], 132-133 | 2013, Online since 08 July 2015, connection on 01 May 2019. URL : <http://journals.openedition.org/jda/4963> ; DOI : 10.4000/jda.4963

LITERACY, TRANSLATION, PRACTICES

Groundwater location under stress in South Kordofan (Republic of Sudan)

Enrico ILLE*

In this article, I analyze processes and practical dilemmas which result from efforts to locate and retrieve water from the ground under conditions of scarcity. More specifically, my case study describes attempts at groundwater location in a mountainous area of South Kordofan (Republic of Sudan). The inhabitants of this area experience regularly water scarcity during dry seasons. Several factors have intensified this scarcity recently, among them protracted civil wars (1987-2002, 2011-?) and steady decrease of rainfall. The observations presented here describe developments during an interim period between the previous and the present civil war.

The study follows hydrogeologists, whose main task is to identify drilling spots for wells and water yards in rural areas. While the task seems to relate merely hydrogeologists' technical knowledge to specific environmental sites, their work is actually embedded in a heterogeneous normative setting: On the one hand, their ability to move to the sites and to use time and material for their assessments is significantly framed by political priorities for

* Institute of Anthropology and Philosophy – University of Halle
Reichardtstraße 11 - 06114 Halle (Saale) - Germany
Courriel: enrico.ille@ethnologie.uni-halle.de

regions, budgets and staff organization. This leads to an economy of knowledge, which deals with limited resources to find water.

Furthermore, the hydrogeologists' decisions about specific drilling spots are influenced by the struggles over access to water negotiated inside the resident social groups. The residents' intimacy with their environment provides topographical guidance, which is often included in considerations by the « experts ». But the hydrogeologists are also often confronted with conflicting claims about the right place, which contain criteria not part of their analytical training. These criteria extend the question where water is to the question who and what water is for. As a result, academic epistemological techniques have to be translated in negotiations of the « way to the water »¹.

Through the case study, this article argues that the representatives of so-called modern science are as much « local » as anybody else. This claim has been well-established in frame of science and technology studies during the last decades. Susan Leigh Star, for instance, argued in 1985 that « scientists in the field often characterize the management of local uncertainty as "not really science" (and with pejoratives including "mere administrative work", "dirty politics", "beancounting", "mere logistics" or even "sociology") », while « the management of local uncertainty [...] is not incidental, but central to research organization » (Leigh Star, 1985: 393). In the wake of this consideration, I engage with debates concerning the role of scientists in society (Latour, 1987), and works on a theory of translation (Czarniawska & Sevón, 2005).

By extension, my analysis works with a conceptual triangle, whose corners are the terms literacy, translation, and practices. After a short introduction of the underlying rationale, I will present the case of an – ultimately failing – attempt of water professionals in South Kordofan to establish a new source of water for the village Abol. I describe the case based on dialogues between village

¹ Durand (2003) has a similar focus on the overlapping and interaction of forms of knowledge classified as scientific and non-scientific.

residents, water professionals and myself². Being unfamiliar with both environments, I consider also the processes of translation between the actors involved in these dialogues.

Literacy, translation, practices

In 2005, the coordinator of the Network of Water Anthropology (NETWA) project of UNESCO's International Hydrological Programme published a short brochure, where she described the purpose of the network as providing an interface between « anthropologists » and « water professionals » (Brelet, 2005: 2). She identified anthropology of water as a way to bring « culture » into discussions about water resources and water consumption. Among the aspects calling for integration through such a network was coordination of « traditional » and « modern science » technologies towards locally « appropriate » technologies: « The use of indigenous technologies implies studying them in their own context, but also upgrading them whenever possible » (Brelet, *ibid.*: 11). Such appropriateness includes also an integration of « local culture » and ecological awareness into decision-making processes (Brelet, *ibid.*: 13). This sharing of knowledge and environmental prudence between « local users » and « water professionals », so the gist of the argument goes, can be mediated by anthropological methods and applied studies.

However, a reference to such technologies remains peripheral in technical documents of UNESCO's International Hydrological Programme. Although these publications mention the importance of good ideas from wherever they come – water professionals or community members – the reliance on new technologies based on

² This case study is based on three week-long fieldwork periods in Abol in May 2009, February 2010 and March 2010, and a number of interviews in Kadugli in January 2010. It was part of my PhD research in frame of the project « Market institutions in the relation of nomadic and sedentary people in the Nuba Mountains / South Kordofan, Sudan » (2008-2012, head: Prof. Richard Rottenburg, Institute of Social Anthropology, University of Halle, Germany), funded by the German Research Foundation.

geoscientific methods prevails: UNESCO's journal *A World of Science* reports proudly the achievements of groundwater mapping in emergency situations in Darfur (Sudan) and during the 2011 drought in the Horn of Africa, possible through a combination of remote-sensing and so-called ground truth data, « provided by a ground penetrating radar and other information drawn from geological, hydrogeological, geographical, hydrological and climate data and, when dealing with deep aquifers, seismological data » (UNESCO, 2012b). So, where is a negotiation of « appropriate technologies » to be found, effectively? Where is it expected to have an impact, and where not?

Instead of an incorporation of other technologies of groundwater location, these and similar documents operate with metaphors, such as « local communities » or « stakeholders », in order to denote the non-scientific other. Many analyses are also very specific about the existence and thematic content of water-related political and social processes, but they often do not provide analytical concepts for the specific processes themselves. « Stakeholders » or « local communities » remain so on the abstract level of a metaphor.

However, recent years have witnessed an increasing mainstreaming of considerations of complex inter-relations in issues of water allocation, especially under conditions of scarcity (e.g. Pereira *et al.*, 2002; UNESCO, 2012a), also by designated mouthpieces of hydrogeological organizations (e.g. Robins *et al.*, 2006; Adelana & MacDonald, 2008). In order to contribute to this debate, the following text employs a triangle of concepts, starting with a concept of literacy which points to individual differences in knowledge and skills.

The term « literacy » has been redefined in frame of attempts at increasing the presence of ecological, i.e. holistic thinking in the circuits of educational systems (e.g. as ecological literacy in Orr, 1992; Capra, 1995). This concerned both the understanding of human actions in their relation to an ecological world system and the integration of different kinds of knowledge, specifically social and natural sciences, partially also knowledge declared

non-scientific in academic settings. In this form, the term carries strong normative elements inasmuch « literacy » means an ability to read signs rightly, in this case the signs of nature-society relations. It is the reconsideration of this meaning in Hares *et alii* 2006 I will discuss briefly here.

The authors redefined « environmental literacy » « as people's perceptions of their physical environment » (*ibid.*: 129), comprising all elements that influence and shape such perceptions. In contrast to pedagogical terminology, « literacy » can be seen here as an analytical tool. This includes thus not only social and academic conventions of describing and understanding physical environment, but also the individual differences, which inevitably occur even between individuals otherwise perceived as one group, e.g. village communities or hydrogeologists. This introduces also the question « whose way of reading and manipulating nature becomes dominant and to what extent does power modify these activities » (*ibid.*: 130). In the view of the authors, such power relations could be questioned by research on environmental literacy and maybe influenced in direction of more equity. This connects also to the avoidance of a presumption « that scientific knowledge is superior, more accurate » (*ibid.*: 131).

Subsequently I will concentrate here on the question, how differences in literacy and their conditions are played out in a situation of scarcity. To this end, I use the term « translation », which « is particularly well adapted to the study of the role played by science and technology in structuring power relationships » (Callon, 1986: 197). Callon's and similar studies of emerging controversies on nature and society are crucial reference points, but I employ Rottenburg's conceptual variation, which acknowledges the emerging possibilities of cooperation beside the creation of control through unification.

In this sense, translation is understood here as the process by which the compatibility of social action – including human speech acts – is heightened: « Translation brings together things that are separate; it establishes a relation and mediates between multiple

elements and makes them compatible and comparable » (Rottenburg, 2009: XXXI).

In the present study, « translation » serves thus as an analytical concept to approach practices, which emerge amidst overlapping and partly conflicting perspectives on and interests in underground water. Thereby the analysis follows different readings of situations, which are supposed to support sense-making as a basis for defining appropriate social action.

The problem of how to capture these complex situational workings of incorporated knowledge and skills (Bourdieu's *habitus*), heterogeneity of perspectives and interests, and structural conditions has been addressed through different practice theories (Schatzki *et al.*, 2001). The so-called practice turn in social theory revolves around an understanding of practices as « arrays of activity » which cannot be reduced either to social structure or to individual actions, but are « embodied » and « mediated by artifacts, hybrids, and natural objects » (Schatzki, 2001: 2).

This understanding adds to the triangle an observational site: While literacy describes the knowledge and skills brought into a social interaction – including interacting with water « hiding » somewhere in the ground – and translation describes attempts to reduce incompatibility between different perspectives and interests, practices are the resulting individual social behaviour, which integrates both *habitus* and situational translation. In this sense, I will question the recurring metaphor « local communities »³.

Groundwater location under stress

The federal state of South Kordofan, including the region of the Nuba Mountains, was one of the most war-affected areas during the Second Civil War in Sudan (1983-2005). It continues to be a border region, where both former war parties and, after the

³ As such, I follow thereby a recommendation of Orlove and Caton (2010), who saw a fruitful contribution in the integration of anthropology of water with science and technology studies, political ecology and material culture studies (Orlove & Caton, *ibid.*: 411).

secession of South Sudan on 9th of July 2011, two national states watch each other furtively and suspiciously in a continuous state of tension. Unresolved issues underlying the war in South Kordofan erupted again into full-scale violence in June 2011 (Rottenburg *et al.*, 2011).

Even before the war, South Kordofan and other regions not part of the central areas around the capital Khartoum had suffered from lack of equal distribution of political power, resources and investment. Instead of bringing a time of stability, the years after a Comprehensive Peace Agreement (2005) nurtured old and new conflicts. Political action of the former war parties was directed towards the demarcation of spheres of influence, less towards issues of « neutral » public administration. This also prevented the establishment of administrative arrangements able to deal with scarce resources, such as drinking water.

Although South Kordofan has a long history of wide-ranging water-related studies, there are only a few hydrogeological studies, which provide information on groundwater. Much of South Kordofan belongs to the Umm Ruwaba Basement, which means there is basically no need for deep boreholes and wells don't have to be dug more than 30 metres deep in the region. A UNEP report of 2007 described the Umm Ruwaba formation as « reportedly an excellent source of near-surface groundwater » (UNEP, 2007: 243). Nevertheless, the availability of data about specific locations is limited, which still causes fundamental problems for the establishment of new water sources in specific settlements.

The availability of water has been one of the central administrative and political issues, in terms both of accessibility and distribution in South Kordofan. During British colonial rule (1898-1956), the region had been one of the focal areas for governmental wells and reservoirs (Lebon, 1956: 83, 84). A recent Strategic Map for South Kordofan quotes a 25 Year Strategy (2003-2027), which still notes rural water provision as an issue of « top priority » (HSC, 2008: 83).

The prioritized objectives and planned steps of the 25 Year Strategy concern water supply to rural and war-affected areas,

stressing several times that « priority should be given to war displaced population in their original villages or in the new resettlement areas » (HSC, *ibid.*: 85). The respective institutional changes involve larger roles for NGOs and the private sector, while the State Water Corporation is to change from being a « service implementer to service controller » (HSC, *ibid.*: 86). This is mentioned in connection with privatization, decentralization and increased responsibilities taken on by communities for their own water management and supply maintenance.

A cooperation between the United Nations Children's Fund (UNICEF) and the regional governments was formed to deal with water issues within the framework of a Water, Environment and Sanitation Programme (WES). WES was based on a 50/50 finance arrangement between the government and UNICEF, but the delay of payments by the government in South Kordofan led frequently to delays or even the cessation of most activities. Furthermore, the co-financed programme WES was mainly active in the state capital Kadugli and had few administrative access points beyond a fragile form of « administration in missions » by officials in, more or less frequent, motion. Only a few of these efforts created effective institutional links between public administration and rural areas. In the following, a failing effort will be discussed in more detail.

Water of places and places of water

In Abol, a village with about 400 inhabitants, the availability of water became an urgent issue during every dry season. In the months before the rainy season was due to come, any possible source of water would be utilized by residents to cover their needs until the relieving rains arrived in May or June, and continued until October. During this time many shallow dry riverbeds and watercourses would be filled for some months by the downpours and the water running from the mountains. So concerns over water diminished temporarily with the heavy rains. During the rainy season, the net of watercourses running through the village carried water to such an extent that trees in riverbeds that were dry for much of the year sometimes had dead branches and leaves caught in their own branches up to 2 metres from the ground, testifying to the

huge volume of water that had flown over them during the rains. Cultivated terraces on the hillsides were flooded, and when the water level subsided, leaving the soil still moist, but not wet, some small vegetable gardens in the riverbeds flourished with onions, tomatoes, and sweet potatoes, and mango trees blossomed.

I got to know Abol's waters in three ways: through guided tours, through tracks and spots recorded in my GPS device, and through talks with my hosts. Each way increased my literacy in Abol's environment in a different way.

During my stay, I embarked on several tours around the village and the mountains that form the hinterland of today's main settlement area, accompanied by guides from the village. My guides were four men who had lived in this hinterland all through the 15 years the war had affected the village. In their accounts, water appeared as an element in places of memory: plenty in the caves and springs of the mountains that protected from bomb shells and governmental soldiers; seasonally scarce in the houses they had left during the war and they recently started to rebuilt near the new down-hill road to the district capital.

The mountain tops, springs, watercourses, and confluences they pointed out were all named and blended water sources and war memories into a landscape: there the mountain of Ndeɽalan, where the rebel army had had their camp, demanding wood, livestock, and water from the civilians; there Giɽiir, a water-carrying cave system, which had been the major source of water throughout the war and was still used as an everyday source of water; there the spring Nɽi, where water was hoped to flow until December.

I recorded the places and waterways I had learned about in a GPS device and redrew them later as a map. Instead of the places of memory I had encountered during the tours, I had now a two-dimensional, fixed picture, which communicates little experience, but « tames » the narratives' complexity⁴:

⁴ A Garmin eTrex Legend HCx was used; the geographical coordinates were converted into the MinDec form (degrees as integer, minutes as real number) and redrawn in CorelDraw 12.

Figure 1. Lower Abol, main sources of water
(Source: own fieldwork)

In the descriptions of my host, Yussif, the down-hill sources of water turned into projects. He had spent his childhood in the mountains, then moved down, migrated to the capital Khartoum, and considered now coming back to Abol again. Although still weighing the options for himself and his family, he has been engaging in the issues of his birth-place since the cessation of violent hostilities in 2002, when some started to risk building their houses down-hill once more. At the same time, some of those who had lived in Khartoum during the war re-contacted their families. They found the same problem of lack of water that had prompted people – even before the war – to move in direction of the district capital Heiban or even to Khartoum.

Yussif remembered that he came back to Abol in 2002 to find only seven families left there. He suggested to them that they should move to a place with more water, but they refused and told him their plan to build a well, without tools if necessary. Yussif collected money from migrants in the towns and abroad, and brought tools from Khartoum. They tried for two years to build a stable structure, but with each rainy season the walls of the well caved in. Then they contacted the organization Norwegian Church Aid, which began to support the project. A 13 metre deep shaft was dug, at which point a mason built the well. However, a large stone prevented them digging any deeper, and all efforts to break it failed, leaving the well's water rather shallow.

In 2007, a further improvement occurred, when a water pump financed by WES was installed by a Khartoum-based company. But the pump also encountered a crisis: In 2009, it began to bring up dirty, smelly water. Yussif had diagnosed that it needed new pipes, and when an attempt to collect money in Abol for the repairs failed, he sent Elias, a former employee of the National Water Corporation (NWC) in Khartoum who had since returned to Abol, with Yussif's own money to buy pipes from NCA and install them. After the repairs, however, the water quality remained questionable, and a privately initiated test in one of NWC's labs showed the water to be non-potable according to national standards⁵.

Another initiative was begun in 2009, as a joint programme of WES and the International Fund of Agricultural Development (IFAD) to provide a water yard with electric pump to the community. IFAD had commissioned WES to prepare and implement this project, and in line with their regulations a quarter of the costs were collected from the community. An engineer and a drilling team arrived in Abol, but the drilling failed to reach water and the attempt was cancelled. No further delegation arrived; requests to the organizations and the government in Kadugli were

⁵ The implications of this situation were discussed in more detail in Ille (2012).

fruitless, and the money collected from the community was not paid back. The situation of lack of water continued.

Encounters

Especially the failure of the 2009 project seemed puzzling: costs were covered, a clear objective was defined, and the implementation was supposed to be a straightforward routine process. In order to understand what had happened, I focused on how village residents and governmental experts perceived mutual encounters.

In South Kordofan's capital Kadugli, I met Salam Kodi, the head of the water and sanitation department of the organization Norwegian Church Aid (NCA), who had been trained in engineering geology. I asked him about his approach to such encounters; he answered with a description of the organization's standard process. According to this standard, he initiates contact with the « target community » by presenting himself to the « village head ». Ideally, all previous studies are known, as well as political and other tensions, which could cause conflicts over drill hole positioning and subsequent water distribution. To this end, he sits first with the village head and plans the next steps; either just based on the head's information or with an assembly, in best case the village committee (VC). This committee will be supervisor of the new water source.

In order to communicate his ideas to me, he started to make notes and drawings on a piece of paper, which became our medium of translation – from Arabic to English and back; from stories to numbers; from landscapes to graphs (see fig. 2).

Based on the hot spots of the so-called community mapping, he does a survey. He creates a topographic map to identify the structural elements of the landscape, such as main watercourses (the hatched part on the paper). To discover aquifers, electromagnetic measurements are made diagonally to the watercourses with a SAS 1000 device that indicates water content and permeability of the underground structure⁶. Only the most effective points nearest to the

⁶ The Terrameter SAS 1000 is a product of the Sweden-based company ABEM.

population are recommended, while the final decision ideally lies in the hand of the community.

Figure 2. Note of the head of the water and sanitation department of NCA in Kadugli (Source: own fieldwork).

Similar ideal processes have been described in several handbooks and manuals, which stress the « stakeholder approach » and « consensus-based procedures » (e.g. MIWR-GoNU *et al.*, 2009: 7). But already Salam's talk showed several cracks that appear in real encounters: impromptu assessment, often termed common sense, instead of intensive surveys, and difficult negotiations mark the everyday life of hydrogeologists in « the field »⁷. He recounted how he learned in a village, where supporters of the former war parties struggled for spheres of influence, that a quarrel over a borehole for a pump started, after he had drilled it. His « mediation » was to drill a second one and, in his words, they should get along with it. In his understanding, he could not work with agreement of all leaders, because the problem appeared after the fact. Understanding and using existing leadership structures has also importance for maintenance, as he argued with another example, where a pump « survived » several years, because it was placed in front of a village leader's house, who controlled how the handle was used.

The existence of a functioning committee was also seen as a precondition, as it was the institution that can always address the nearest governmental representative according to spheres of influence. This provides a channel, through which the organization as original provider of the service can legitimately communicate. He asserted, however, that large organizations, such as IFAD and WES, but also different ministries, often create their own organs in villages, causing overlapping interfaces that cause confusion.

Indeed, the encounters that were unfolded in different narratives about Abol's water yard were confusing. A central figure of most narratives was the village representative to the former rebel movement, 'Az al-Dīn. He had come in 1989 from the district capital Heiban to Abol and settled on a hill near today's market, surrounded by rebel soldiers on the ridges. His house was in a strategic position on this hill, and a major part of his activities

⁷ See Durand (2001) for an anthropological perspective on hydrogeological « fields ».

aimed at establishing the central buildings and constructions of post-war Abol near the new road, the new school, and his house.

He recounted that the water yard project was only initiated after he had spoken personally with high-ranking politicians in Kadugli. IFAD had promised to construct a water yard in the village, and the organization had demanded 15 000 SDG (at that time about 5 000 €) as a community contribution. But the collection in Abol amounted to only 1 000 SDG, so migrants in Khartoum contributed 9 000 SDG, and the remaining gap was filled by a donation of the then deputy governor of South Kordofan, who was from a nearby village.

After 15 000 SDG had been handed over to IFAD, they waited for the water yard to come. When finally an engineer arrived, he went with the former National Water Corporation (NCW) employee Elias in a wide circle around the village. The engineer had said that there was good water further uphill, near ^cAz al-Dīn's house, and marked a particular spot. When the drilling team arrived, it had actually started to drill a borehole for a water pump in another village, but left after a quarrel with the population there about the location. So they came to Abol with seven pipes and drilled, but had to stop due to solid rocks after only two pipes had been put in the ground. They then left.

At this point IFAD convened a meeting in Abol, where the following options to proceed were discussed, since the water yard option had to be regarded as having failed: 1) a water reservoir was considered impossible, because of Abol's topography; 2) the construction of dams would require much more time; 3) so the best option would be to give back the money the community had contributed. This last option was refused, because the assembly demanded an immediate solution. Nothing else happened.

Another story was told by Elias, the former NWC employee just mentioned. After they had failed to smash the rock at the bottom of the well, he, Yussif, and some other men of the village had considered other options, long before the meeting with IFAD. They disregarded a reservoir, because the soil around Abol that could be dug was mostly over sand, meaning that it would take a lot

of effort to reach the rock layer. Therefore they had preferred the idea of installing more water pumps.

In Elias' narrative, the IFAD delegations went exclusively with the village representative, ^cAz al-Dīn, and the drilling was both undertaken at the wrong spot and in a manner that was technically wrong. He himself had taken out, examined and cleaned the 11 pipes of the existing water pump, each of 3 metres length, and saw about 2 metres of water below; further down, he was sure, one would find easily accessible groundwater. Furthermore, the drilling team people used 3-inch pipes, which are for water pumps, not the 4-inch pipes used for water yards. The blame, he felt, should therefore lie somewhere between ^cAz al-Dīn and the organization.

In the narratives of others, a further source of blame appeared: the village representative had insisted that the water yard be near his own house at the market, which angered many people. This anger was all the greater since some recounted that IFAD's engineer had spoken about the presence of an « underground lake », which would have admitted easily three or four water pumps.

I went on to consult employees of the organizations. In IFAD's headquarter in Kadugli, the executive director told a new story: on the initiative of IFAD, WES had committed in the rainy season 2008/2009 to a survey and implementation of the water yard, according to IFAD stipulation, with a 25% share of the costs to be provided by the community (15 000 SDG) and the rest from IFAD (45 000 SDG). Both prospective locations suggested to WES by the « people of Abol » were found to be dry, and the proposal to drill further away was refused, therefore WES should have paid back the money to Abol's community.

By this time, however, IFAD had proposed a deep survey near the village, and WES had to wait out the rainy season in order to start afterwards. But then a village in eastern South Kordofan experienced a drought, and the governor ordered all organizations to focus their attention there. At this point another WES delegation was supposed to go to Abol; they never did.

Finally, I went to WES at the Ministry of Water Resources (MoWR) in Kadugli. The story offered by the geological engineer

who had led the preliminary survey in Abol was short: In 2008, a delegation from the MoWR went to Abol, in order to survey the water resources. The result was a study of ten possible spots for drilling, all of which turned out to have only small amounts of water. The report ended with the recommendation to build two dams in the main riverbed, upstream of the existing pump that WES had already constructed. The report also noted that 15 000 SDG would be needed for further study and implementation of the dams. What happened then is that the study disappeared in the vice-governor's office under the heap of other things to be done.

The second part of the story starts at the beginning of 2009 with IFAD, which commissioned a study for a water yard; this was conducted by the engineer Sulimān Aḥmad, with whom I also spoke. He, like all the geologists in WES, works on commission, which in this case was the contract with IFAD. He searched in the general area chosen by the village representative ^cAz al-Dīn. He searched according to geological features and with the help of a Terrameter SAS 1000; two spots were chosen for drilling. The amount of water found was insufficient, however, and therefore other solutions such as dams were offered to « the village », but were refused. In any case, WES took, in accordance with its regulations, 30% of the overall costs of failed projects, which in this case amounted to about 18 000 SDG. Since no further study was commissioned, the whole issue ran dry at this point.

Two years later, Abol's people were again surrounded by war, returning once more to relying on the water in the mountain caves, and any new period of construction will start in a situation very much like that existing when I last visited the village.

Discussion

In my attempts to understand why the 2009 water yard project had failed, I was confronted with very different stories of what had happened. Instead of meeting either competing individual interests, *or* traditional ideas vs. modern science, *or* rural communities vs. the government, I found many elements entangled. Instead of a clear-cut « local community », there were several literacies and

situational translations under both structural and individual conditions.

For many village residents, the water yard represented a new relationship both to the water in the ground and to non-residents. The former was expected to be reached in a new, more comfortable way, the latter were about to act not in frame of violent conflicts, but as providers. Both marked emerging trust in living down-hill, away from the caves with permanent water and protective walls.

However, although this reading of the situation was more or less shared, the specific location of houses related individuals differently to prospective locations of the water yard. ^cAz al-Dīn, in the reading of his co-residents, saw the new source of water connected to the definition of a new village centre around a market, close to a road to the district capital and near his own house. The failed drilling marked this reading a misled prioritization of allegedly private interests. His power to represent had thus an ambiguous quality: his voice brought the project to the village, his voice made it fail.

For the governmental water professionals, opportunities to learn to read the natural and social environment were limited in several ways. The chances to observe directly were almost cut down to one-time visits, due to an underfinanced administrative system and political struggles for resources still following the antagonistic logic of war. Therefore they had to cope not only with the tasks they had been trained for, but with a scarce economy that defined in which way they can attempt to acquire the knowledge necessary for their jobs.

As a consequence, those individual professionals reaching the village relied on delegation: general orientation was delegated to hydrogeological « common sense », definition of acceptable distance to the settlement was delegated to « the community », understanding the texture of the ground was delegated to a device.

The resulting misreading had serious consequences not for the implementing organization, but for the village residents: the former received a compensation for its costs, but the latter were not compensated for their betrayed trust, both in prospects of comfort

and in the existence of providers. The lack of trust in a post-war situation had already limited the readiness to invest financially into the project, compensated by migrants in Khartoum; the readiness to accept delays seemed to have vanished, too, when representatives of the organizations suggested starting anew.

But the focus of the narratives had been to merely identify fault. The roles supposed to be played in the interactions were challenged; ‘Az al-Dīn’s role as « voice of the village », but also the water professionals’ role as experts. Far from accepting the latter as unquestioned representatives of science and technology, Elias had significant, technical doubts about how they did their job. This doubt was also directed at a situational solution, when a political conflict concerning a water pump in another village was exchanged for a technical conflict concerning a water yard in Abol.

However, I propose to go further beyond the « fault lines » drawn by the narratives by looking at processes of translation. According to the concept defined in the beginning, translation is the attempt to create compatibility of social action, an attempt which may fail. Looking at translation means thus to look at what needs to come together for something else to come about.

The aim of the attempt at hand was to create better access to underground water. What was needed to come together was somebody making an appropriate guess, where underground water existed in accessible form, somebody taking the decision, where exactly such an access was to be located, and something creating a link between the underground water and the surface.

So the standard process NCA’s water expert described was based on the presumption that hydrogeological analysis – supported by local knowledge – will facilitate appropriate guesses. It continued with the presumption that « communities », represented by a leader or a committee, can choose an appropriate place following these guesses. This was based on the presumption that an accommodating agreement among « stakeholders » or « community members » can be reached. The drilling was then only the appliance of seasoned technology.

After all, a failed and costly bore-hole experiment was what resulted from these efforts. This failure resulted from the attempt to channel a process full of uncertainties into a simplified technical fix. Rather than looking for flexible, fluid solutions with many adaptable options of translation, the taken approach ignored several organizational innovations such as for manual drilling, which have been well-explored and would fit much better to the weak administrative structures in effect here⁸. Rather than triggering debates on the epistemological basis of groundwater location, the process was thick with politics (Bijker, 2007) and negotiations of appropriate social action. Rather than failing to bridge cultural differences, the translation went ill over fragmentary communication – four encounters in three years – and presumed legitimacy of representation where conflicting perspectives prevailed.

Conclusion

There are certainly many structural reasons for the presented failure to establish a new source of water, which show obvious necessities for reform and changes of priorities. But rather than pondering over structural changes, negligence of which already brought back violent struggle to the region, the focus was here to unravel the complexity of the « local ». Instead of defining « local communities » as a matter of size or specific cultural setup, the analysis of complex encounters of heterogeneous actors seems to gain from concepts grasping the situational interaction of actors.

According to the conceptual triangle proposed here, such an interaction creates and is created through processes of translation, and leads subsequently to maybe coordinated, but still individual practices. Acquaintance with these different, co-existing practices and their embeddedness allows then following how such encounters

⁸ A UNEP study noted some years ago again the low standard of water management in Sudan (UNEP, 2007: 241) and an unadjusted investment in large-scale projects defying efforts at increasing equity, broad participation and accountability (UNEP, *ibid.*: 248).

take place and, if a normative position is desired, formulating how they should take place. Alternative observational perspectives, such as those provided by anthropological research, might support such acquaintance in a climate favourable for open-ended negotiation.

BIBLIOGRAPHY

ADELANA S. M. A., MACDONALD A. M., 2008. « Groundwater Research Issues in Africa », in ADELANA S. *et alii* (dir.), *Applied Groundwater Studies in Africa*. Boca Raton, CRC Press: 1-7.

BIJKER W. E., 2007. « Dikes and Dams, Thick with Politics », *Isis*, 98(1): 109-123.

BRELET C., 2005. *Global Network of Water Anthropology for Local Action, IHP/2006/NETWA/1*. Paris, International Hydrological Programme-NETWA, Division of Water Sciences, UNESCO.

CALLON M., 1986. « Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St.Brieuc Bay », in LAWRENCE D. L. & LOW S. M. (dir.), *Power, Action and Belief. A New Sociology of Knowledge?* London, Routledge & Kegan: 196-233.

CAPRA F., 1995. *The Web of Life*. New York, Harper Collins.

CZARNIAWSKA B., SEVÓN G., 2005. « Translation is a Vehicle, Imitation is a Motor, and Fashion Sits at the Wheel », in CZARNIAWSKA *et alii* (dir.), *Global Ideas. How Ideas, Objects and Practices Travel in the Global Economy*. Malmö, Liber: 7-14.

DURAND J.-Y., 2001. « Entre sédiments, strates, et failles : "le terrain", une métaphore minée ? », *Ethnologie Française*, 31(1) : 127-141.

DURAND J.-Y., 2003. « Hydrogeology and Water-Dowsing: Countercurrents and Confluences », paper presented at the 3rd conference of the International Water History Association, Alexandria.

HARES M., ESKONHEIMO A., MYLLYNTAUS T. & LUUKKANEN O., 2006. « Environmental Literacy in Interpreting

Endangered Sustainability. Case Studies from Thailand and the Sudan », *Geoforum*, 37: 128-144.

HSC, 2008. *Southern Kordofan Investment Map*. Volume 2: *Natural Resources*, Part 1: *Climate & Water Resources*. Khartoum, Horticultural Services Cooperative.

ILLE E., 2012. « The Classification of Drinking Water Between Public Administration and Rural Communities in South Kordofan, Sudan. Travelling Models and Technologies », *Sociologus*, 62(1): 73-93.

LATOUR B., 1987. *Science in Action: how to Follow Scientists and Engineers through Society*. Cambridge, Harvard University Press.

LEBON J. H. G., 1956. « Rural Water Supplies and the Development of Economy in the Central Sudan », *Geografiska Annaler*, 38(1): 78-101.

LEIGH STAR S., 1985. « Scientific Work and Uncertainty », *Social Studies of Science*, 15(3): 391-427.

MIWR-GoNU, MWRI-GoSS & WASH-UNICEF, 2009. *Technical Guidelines for the Construction and Management of Borehole Hand Pumps. A Manual for Field Staff and Practitioners*. Khartoum & Juba, Ministry of Irrigation and Water Ressources-Government of National Unity, Ministry of Water Resources and Irrigation-Government of South Sudan & Water and Environmental Sanitation Section-UNICEF Sudan.

ORLOVE B., CATON S. C., 2010. « Water Sustainability: Anthropological Approaches and Prospects », *Annual Review of Anthropolopgy*, 39: 401-415.

ORR D. W., 1992. *Ecological Literacy: Education and the Transition to a Postmodern World*. New York, SUNY Press.

PEREIRA L. S., CORDERY I. & IACOVIDES I., 2002. *Coping with Water Scarcity*. (IHP-VI, Technical Documents in Hydrology, n° 58). Paris, International Hydrological Programme, UNESCO.

ROBINS N. S., DAVIES J., FARR J. L. & CALOW R. C., 2006. « The Changing Role of Hydrogeology in Semi-Arid Southern and Eastern Africa », *Hydrogeology Journal*, 14(8): 1483-1492.

ROTTENBURG R., 2009. *Far-Fetched Facts. A Parable of Development Aid*. Cambridge/London, The MIT Press.

- ROTTENBURG R., KOMEY G. K. & ILLE E., 2011. *The Genesis of Recurring Wars in Sudan. Rethinking the Violent Conflicts in the Nuba Mountains / South Kordofan*. Halle, University of Halle.
- SCHATZKI T. R., 2001. « Introduction. Practice Theory », in SCHATZKI *et alii* (dir.), *The Practice Turn in Contemporary Theory*. London/New York, Routledge: 1-14.
- SCHATZKI T. R., KNORR CETINA K. & SAVIGNY E. V. (dir.), 2001. *The Practice Turn in Contemporary Theory*. London/New York, Routledge.
- UNEP, 2007. *Sudan: Post-Conflict Environmental Assessment*. Nairobi, United Nations Environment Programme.
- UNESCO, 2012a. *Managing Water under Uncertainty and Risk. The United Nations World Water Development Report 4*. Paris, United Nations Educational, Scientific and Cultural Organization.
- UNESCO, 2012b. « UNESCO Combating Drought in Horn of Africa », *A World of Science*, 10(1): 10.

Summary

This article presents a case study about groundwater detection in a mountainous area of South Kordofan in Sudan. The inhabitants of these areas regularly experience water scarcity during dry seasons. Several factors have intensified this scarcity recently, among them protracted civil wars (1987-2002, 2011-?) and a steady decrease of rainfall. The study follows an attempt to establish a new source of water in the village of Abol. While the task seems merely to relate governmental hydrogeologists' technical knowledge to specific environmental sites, their work is actually part of on-going negotiations of appropriate social action.

In order to conceptualize the observed processes, the article reflects on the concept of environmental literacy and its ability to point to multiple individual perspectives on physical and social environments. The argument also employs the terms « translation » as an analytical concept to grasp attempts to create compatibility of social action and « practices » as individual social behaviour, which integrates both habitus and situational translation. The article concludes that careful scrutiny of these ways of accessing water allows for the identification of the ambiguities necessarily occurring during translation. In a situation favourable to open-ended

negotiations, this may provide new perspectives on how to address these ambiguities.

Key-words: post-war scarcity of resources, access to water, environmental literacy, translation, Sudan.

Résumé

Aptitude, traduction, pratiques : la localisation de l'eau de nappe sous stress dans le Sud Kordofan (République du Soudan)

Cet article présente une étude de cas sur la découverte d'eau souterraine dans une région montagneuse au Sud Kordofan (Soudan). Les habitants de ces zones subissent régulièrement des pénuries d'eau pendant la saison sèche. Plusieurs facteurs, dont les guerres civiles prolongées (1987-2002, 2011-?) et la diminution des pluies, ont récemment aggravé cette pénurie. L'étude suit une tentative visant à exploiter une nouvelle source d'eau dans le village d'Abol. Si cette tâche ne semble impliquer qu'une connaissance technique des sites par les hydrogéologues officiels, leur travail s'inscrit en réalité dans une négociation constante pour définir de l'action sociale adéquate.

Pour conceptualiser les processus observés, l'article part d'une réflexion sur la notion d'*environmental literacy* et sa capacité de focaliser sur des perspectives individuelles multiples concernant les environnements physiques et sociaux. Le terme de « traduction » est également utilisé comme concept analytique pour saisir les tentatives de créer une compatibilité de l'action sociale et celui de « pratiques » en tant que comportement social individuel qui intègre à la fois l'habitus et la traduction en situation. En conclusion, un examen soucieux de ces modes d'accès à l'eau permet d'identifier les ambiguïtés inévitables dans la traduction. Dans une situation où des négociations s'engagent pour atteindre un objectif donné, cette démarche peut fournir de nouveaux moyens d'interpréter ces ambiguïtés.

Mots-clefs: pénurie d'après-guerre, accès à l'eau, *environmental literacy*, traduction, Soudan.

* * *