Indigenous environmental knowledges and sustainable development in semi-arid Africa

Research methodology and methods

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1 Methodological considerations

A trusted and well-used method of collecting data and information has been that of formal questionnaire surveys based on carefully, and sometimes not so carefully, constructed random sampling frameworks. This provides a degree of control over the validity and representative nature of statements which can be made about particular populations. Although an efficient and frequently effective way of collecting large amounts of data, there can also be difficulties with this approach. Questionnaires can impose their own logic on the respondent, and therefore the results may be less representative than claimed, as less of the voice of the respondent is heard, drowned out by the structured approach of the questionnaire. In any case, questionnaire surveys, because of their imposed structures, are notoriously inefficient at teasing out deeper meanings held by members of communities, and at identifying the multiplicity of concerns within those communities (Frankfort-Nachmias and Nachmias 1996).

An alternative approach has been to develop qualitative methodologies. Whereas formal, structured sample surveys are seen to be objective, rigorous and (quasi-) scientific, and therefore produce what are seen to be scientifically legitimate results, qualitative methods are criticised for being the opposite. There remains a strong conviction among many that quantitative data are essential, and, indeed, a power accrues to these knowledges through the legitimisation afforded by formal science discourse (Agrawal 1995; Kalland 2000). However, there are difficulties. Whereas science fragments, compartmentalises, tests and reconstructs knowledge in a systematic, controlled and replicable manner, this approach is not always particularly helpful or enlightening when trying to understand the complexities inherent in real world socio-economic and cultural situations, where knowledge held by individuals or communities is not divided up into discrete and convenient chunks (Swift 1979; Ellen and Harris 2000). Indeed, this raises the very real danger that other local/indigenous/community knowledges become distorted by attempting to impose the structures of western scientific models on them (Sillitoe 1998). Local or indigenous knowledges, for example, are more behaviour-based and holistic than scientific knowledges, and can only be meaningfully interpreted in the social and economic contexts within which they have been developed (Kalland 2000; Sillitoe 1998; Turner 1993). The idea that local knowledges can be fragmented and de-contextualised is not helpful. As Kalland (2000:326) succinctly puts it: “as local

people are more concerned with qualitative data, it follows that it is difficult to incorporate their knowledge into the scientists' models".

This study will largely employ qualitative methods compatible with these lines of methodological argument. The emphasis will be on identifying and teasing out the holistic, contextualised and nuanced knowledges of people from within the communities. This is to be achieved by working with local people over extended periods of time, and encouraging an atmosphere of mutual trust in which 'conversations', rather than interviews, take place. Although a checklist of topics has been developed, based on previous fieldwork in the Eastern Desert by members of the research team, this list can be seen as provisional in the sense that some topics may in time disappear from it, and others become added, in the light of conversations. As far as possible, the agenda is informant-driven. This does not mean that quantitative or 'objective' data are to be ignored. Rather, they will be used, as appropriate, to support arguments, but not to generate the arguments themselves.

2 Choice of study groups

Three main study groups in particular geographic locations were initially selected, these being bedouin in downstream Wadi Allaqi; 'urban' Bedouin from around the city of Aswan; and Bedouin in the hill areas (*jebel*) of the Eastern Desert. These three groups were chosen because of the controlled differences which they brought to the study. The Bedouin of downstream Wadi Allaqi comprise groups who have relatively recently moved into that area to take advantage of the new resource opportunities, primarily guaranteed water and associated grazing associated with the High Dam Lake (Lake Nasser). Environmental knowledges have had to develop to take account of this new natural resource base. In addition, as the area is only about 200km south of Aswan, and an asphalt road has recently been constructed to serve the area, this generates questions as to how local knowledges are further mediated by outside experiences which are now relatively commonplace, at least for the men. This, of course, raises a central issue for this research as the extent to which local knowledges possess an identifiable gender dimension. The Bedouin in this area are overwhelmingly Ababda, mainly from three clans (Fashekab, Hamedab and Sadenab), although a Bishari man has married into one of the communities.

The 'urban' Bedouin represent a group which has chosen for various reasons to migrate out of the desert and live in an urban, or peri-urban, environment. The choice of this group was made partly to investigate the ways in which environmental knowledges developed in the desert become mediated by the urban experience and, indeed, may become lost, and partly to evaluate the place-specific nature of such knowledges and how they evolve. Of particular interest is the extent to which desert environmental knowledges have survived the urban transition and the generation gap between the older generation, who have known the desert, and the younger generation, who are essentially urban residents with little desert experience. This comparative element to the study is important as it may help to identify changes in attitudes towards (and knowledge about) natural resource management, where socio-economic development occurs along the trajectory of sedentarisation. Informants among the settled Bedouin are from both Ababda and Bishari.

The third group proposed is located in Eigat near the Egypt-Sudan border at some distance from downstream Wadi Allaqi and some considerable distance from the two towns of Aswan in the Nile Valley and Shalateen on the Red Sea Coast. This group, therefore, has the least regular contacts outside their area, and, in that sense, is potentially the group with the least amount of outside mediation of their environmental knowledges. Moreover, water is of much more critical concern for this group than the other two, as they are wholly dependent on winter rainfall for grazing and the replenishment of groundwater for wells. However, a major practical problem curtailed our proposed fieldwork programme in this area. Following the September 2001 attack on the World Trade Center in New York, the Egyptian military authorities withdrew travel permits for the southern half of the Eastern Desert as a precautionary security measure. It therefore became impossible to visit Eigat after October 2001. However, in February 2002 some relaxation of this situation was introduced, and permits are being selectively issued for one 4-day visit per calendar month. Consequently, members of the research team visited the area in mid-February 2002 and started data gathering. However, whereas the work in downstream Wadi Allaqi and among the 'urban' Bedouin has been based on repeat visits and has adopted a longitudinal approach, this was no longer possible upstream. The material collected in Eigat was not sufficiently rich and detailed to allow for meaningful comparison with that collected in the other two field sites.

As a consequence of this problem, but also due to concerns that the project needed the contrast of a distinct (yet comparable) physical environment to the Eastern Desert to highlight local knowledge differences, it was decided to conduct further fieldwork at an alternative third site. The area chosen is in and around the Siwa Oasis and Qattara depression of the north-western Desert of Egypt. This provides a contrasting natural environment to the Eastern Desert in that the local ecology is largely based around artesian groundwater, and thus natural resources are not subject to the same degree of temporal and spatial fluctuation as rainfall and lake levels which underpin the ecology of the south. Two study groups in this area are drawn from among the Berber Siwan population and from the Awlad Ali Bedouin, these being communities which use and manage resources in essentially different ways.

3 Study group household coding and case histories

For ethical reasons, research participants have not been named in this report and are instead allocated a code letter. This coding system is employed throughout the report and enables the reader to refer back for summary information. Codes have been allocated on the basis of participation in discussions. Since separate male and female discussions were always conducted, this has resulted in multiple codes for a single extended household (i.e. male and female participants). The following case histories provide household information holistically, with one or more codes allocated to each extended household. The gender of individual research participants and the relationship between them is given in the code box.

A	Male	
B	Female	Wife of ***A***
C	Female	Daughter in law of ***A***

A is the senior member of the Hamedab (Ababda) clan at Wadi Um Ashira at downstream Wadi Allaqi. Other Hamedab are found in the Nile Valley and the Eastern Desert, for example, at Abraq wells.

The *hissa* at Um Ashira comprises about six sub-households (those of **A**'s sons and nephews). The group has been in Um Ashira for about ten years, but moved to their current location about three years ago after the lower wadi was flooded. Owing to drought, the household has not shepherded livestock to their traditional upstream pastures for five years, and charcoal production and medicinal plant collection has now also ceased.

The principal income of the group is from livestock production (principally sheep, although some camels and goats are also managed). ***A*** makes extensive use of agricultural residues at Abu Sku and spends most of the year there with his sheep (the goats remain at Um Ashira with the women). ***A*** maintains a close personal relationship with the farmers at Abu Sku to gain access to the fodder there. This means that he usually needs to be at Abu Sku in person to arrange livestock access.

While many of the menfolk are away at Abu Sku or visiting markets in Aswan, the women hold responsibility for herding the goats locally at Um Ashira (each household has about 20). However, there is usually at least one adult male in the camp (often one of ***A's*** sons).

While the men travel frequently to Aswan, women are much more restricted and only go when necessary for visits to the doctor or for special occasions, such as weddings.

D	Male	
E	Female	Wife of ***D***
F	Female	Daughter of ***D***'s brother

D is the senior member of the Sadenab (Ababda) clan at Wadi Allaqi. Other Sadenab live in the Nile Valley. There are about eight households and about 40 people in this group.

The Sadenab originally lived around the Unqat wells in upstream Wadi Allaqi. They 'owned' these wells and other natural resources in the area, but moved downstream to Wadi Allaqi about 20 years ago (or about 10 years after the creation of Lake Nasser). The reason for this move was drought, the death of their camels, and the prospect of better access to Aswan. Due to the continuing drought, the Sadenab have not returned to their traditional upstream pastures for several years. Instead, Sadenab livestock are herded around the lake area. They are the only Bedouin group in Wadi Allaqi who do not have regular access to post-harvest residues from agriculture. The group have a small number of camels (three or four).

Some Sadenab men are employed with the Egyptian Environmental Affairs Agency (EEAA) and the Unit for Environmental Studies and Development (UESD) of South Valley University in Aswan, and bring in a small income. In addition to local sheep and goat herding, most Sadenab women cultivate small gardens on the lakeshore. The group also receives a small income for looking after the boats of unlicensed fishermen.

Women from the Sadenab visit Aswan very infrequently.

G	Male	
H	Female	Wife of ***G***

The ***G*** is eldest brother of his family, thus the senior member of the Fashekab clan at Wadi Allaqi.

The Fashekab were resident at Wadi Quleib until 2000, after which they moved permanently to Sayalla on the southern shore of the lake in Wadi Allaqi. Prior to this move, they had been seasonally visiting the area with livestock for about ten years (since agricultural production first began at Sayalla).

Sayalla is being developed into a small village with some basic infrastructure, and ***G*** is talking of wanting to build a house and settle permanently in the area. ***G*** has not sent his livestock upstream for several years because of drought so he sees no advantage in remaining mobile.

Agricultural residues are available at Sayalla for much of the year and the household has now established links with the farm owners. Since ***G*** now owns a pick-up truck, travel to Aswan is much easier than formerly and the household supplements its livestock income with the hire of the truck to deliver supplies.

Women of the household remain responsible for sheep and goat management around the lakeshore, while the men supervise grazing on agricultural lands and camel browsing. Although far from Aswan, the members of the household are able to visit Aswan with regularity because of the vehicle. The households of several kinsmen are located in the vicinity of ***G***'s household, as they are increasingly dependent on supplies delivered by his vehicle

I	Male	
J	Female	Wife of ***J***

I is brother of ***G***, the senior member of the Fashekab clan at Wadi Allaqi.

The Fashekab were resident at Wadi Quleib until 2000, after which they moved permanently to Sayalla on the southern shore of Wadi Allaqi. Prior to this move they had been seasonally visiting the area with livestock for about ten years (since agricultural production first began at Sayalla).

Although ***I*** and ***J*** live separately from ***G***, they remain in the same general area, as they share access to the same agricultural residues and depend upon ***G***'s vehicle for supplies. The principal income of the household is livestock, and about 130 sheep and goats, and three camels, were observed there. The household is heavily dependent upon the neighbouring farms for the supply of agricultural residues as fodder.

At present, household mobility is restricted to local movements along the lakeshore and herds have not been shepherded upstream for about three years.

K	Female	

K is a single woman of the Fashekab. She lives alone with her teenage son. She moved to the area of Sayalla from Wadi Quleib three years ago to take advantage of the residues on agricultural farms there.

They have a small herd of about 30 sheep, which is their sole source of income, although her son also contributes labour to ***G*** and ***I***'s households. They receive logistical and other support from the household of ***G***.

L	Male	
M	Female	Wife of ***L***

L is a member of the Ababda Sadenab clan, settled in the village of M'qata in the Nile Valley. His father first built their house and brought ***L*** to the village when he was a child.

In many cultural respects the household seems very much like its Egyptian neighbours; the women go unveiled in the company of men and never visit the desert areas outside the village. Unlike the desert Ababda, the women in the village do the milking of sheep. While the household has no camels, it does own a cow.

L describes himself as a "sheep capitalist". He buys sheep as a joint venture with other people's capital, then grazes and resells them, dividing profits fifty-fifty with his investors. While the household makes heavy use of village agricultural resources for fodder, ***L*** and his sons also seasonally drive the sheep down to the west bank of Lake Nasser for lakeshore grazing. The women never accompany them on these trips. Until the recent drought, ***L*** also sometimes took his herds back up to his kinsmen in Wadi Allaqi.

The household owns a small area of land and date palms in the village. The women of the household tend the cow and a few sheep for household use, while the men are responsible for the larger herds. All the household members assist in the seasonal date harvest (both their own and neighbours') which rewards them with a portion of the harvest and grazing rights around the village.

N	Male	
O	Female	Neighbour of ***N***

N was one of a group of Ababda and Bishari interviewed at Wadi Abu Sbeira in the Nile Valley. ***N*** is a Fashekab Ababda, as was one neighbour, while a second was a Hamdorab Bishari. This second neighbour was ***O***'s uncle. Because this uncle was frequently absent, he was only interviewed once, but his Ababda neighbours were always on hand.

N and his neighbour were both born in Abu Sbeira and grew up there. Both are employed as guards by a local company and thus know little about the wider environment. However, after marriage ***N*** decided to get involved in livestock and bought himself a herd. He now travels annually to the Western Desert with these as a sort of working holiday.

The Bishari and his niece ***O*** came to Abu Sbeira about ten years ago from upstream Wadi Allaqi. They still live in tents among the Ababda houses of the village. The Bishari's business brought him to Abu Sbeira; he works as a professional camel drover, meeting *dababik* (camel herds) at the Sudanese border and bringing them up the west shore of Lake Nasser to Abu Simbel where they are loaded onto trucks. He invests his salary in camels which he buys and sells himself at Daraw market.

None of the settled Bedouin at Abu Sbeira own land and while ***O***'s uncle has some sheep of his own they are looked after by relatives in the desert. The Ababda and Bishari women at Abu Sbeira are allowed to visit the agricultural areas around the village and take small herds of sheep and goats for foraging. Except for ***O***'s uncle, none of the respondents are regular visitors back to Wadi Allaqi.

P	Male	

P is a Hamdorab Bishari who lives in the Bishari district in Aswan. He was born there. Like his father before him, he works as a trader and agent for his Bishari kinsmen in the desert (upstream Allaqi and Elba). ***P*** receives and markets supplies of charcoal, livestock and other desert commodities from the interior. He supplies his kinsmen with information and provides representation and services for them in the Nile Valley. Among these services, ***P*** organises for livestock to be grazed on agricultural residues immediately before sale to put extra weight on. He also cares for sick relatives when they come to Aswan for medical treatment.

He maintains a network of contacts and associates throughout the Nile Valley, the Eastern Desert and even in Cairo. Because of his business, ***P*** often travels to Wadi Allaqi and the Eastern Desert.

P has livestock of his own, but these are kept in the desert with his Bishari kinsmen. ***P***'s eldest son does not want to follow the family trade. He cannot speak the Tu Bejawie language, and instead works on a cruise ship on the Nile.

Q	Male	
R	Female	mother of ***Q***

Q and his family are Ashaebat Bedouin of the Awlad Ali tribe. They live in the village of Baha el Din, the western-most settlement of the Siwa oasis. ***Q*** was born in Siwa, but his mother was brought to Siwa for marriage from a Libyan desert tribe.

The Ashaebat haved lived at Baha el Din for more than a hundred years, but only the generation of ***Q***'s father built houses alongside the native Siwans and settled there. ***Q*** helped his father to establish olive and date producing gardens. ***Q*** himself works during the summer months as a professional shepherd, hiring his services to Awlad Ali Bedouin from the north coast, and managing sheep in the desert west of Siwa. While ***Q*** is absent, his sons tend the gardens and his wife, mother and daughters manage the household livestock around the village.

While the Bedouin of Baha el Din have adopted some aspects of Siwan culture (such as language), the women have much greater freedom of movement than Siwan women.

S	Male	

S is a Berber Siwan living in the main settlement of Shali. He lives with his mother and sisters, and, as the only adult male in household, he is responsible for tending the family's gardens.

S also has older brothers who have left Siwa to work in Cairo and Alexandria and remit money to their family. The household's local income derives from the sale of olives and dates, but some other vegetables and crops are also grown for domestic consumption. ***S***'s mother and sisters manage about 15 sheep in a pen beneath their mud-brick house. While the family is not wealthy, neither are they poor by Siwan standards.

T	Male	
U	Female	Wife of ***T***

T is Sheikh of the Al Qara clan, one of the eleven Berber tribes of Siwa. Al Qara is a small oasis about 130 kilometres east of Siwa, at which live the 65 families of Al Qara. Until very recently, the population at Al Qara was severely restricted by the availability of water for drinking and irrigation, but this changed when a deep well was sunk.

T, like all Al Qara people, manages a garden cultivating olives and dates for market, and vegetables for domestic consumption, while ***U*** and his daughters are largely confined by Siwan tradition to the house where they care for a small number of goats. The women rarely visit the gardens.

The households of Qara differ from those elsewhere around Siwa because they are remotely located, and thus have closer ties to the passing Bedouin than to the other Siwan tribes.

V	Male	
W	Female	Wife of ***V***

V is the senior member of a group of Asheibat Awlad Ali Bedouin who settled at Ain Safi in the eastern part of Siwa in the mid 1980s.

The household has in the past ten years just begun cultivating, although land ownership is not yet widespread among the Bedouin at Ain Safi. At present, the household is still largely dependent upon other income sources. They manage their own livestock (sheep and camels), and the young men of the household provide shepherding services for Awlad Ali Bedouin from the north coast, taking their herds far into the desert during the summer months.

Unlike the Bedouin settled at Baha el Din, those at Ain Safi have not yet had the opportunity to integrate with their Siwan neighbours, and so have not taken on any of their cultural attributes or learned their language. Although related to the Asheibat Bedouin at Baha el Din, the household of ***V*** also maintains strong links to the tribes of the north coast.

W and the women at Ain Safi spend much of the day herding livestock locally around the settlement.

X	Female	

X is the wife of a senior member of the Asheibat Bedouin clan at Baha el Din in eastern Siwa. The household has always been based at Baha el Din, although during previous generations it was more seasonally mobile than at present. ***X*** remembers visiting several desert oases when she was younger.

The head of household has invested heavily in extending their cultivated gardens, and the livestock dependency of the household has diminished. In addition to date and olive cultivation, three adult sons of the household are employed and bring in a salary. A small number of domestic livestock is maintained by ***X*** and her daughters.

Unlike the neighbouring Siwan women, Bedouin women like ***X*** are free to wander the village, visit the gardens and even ride a donkey.

4 Discussion and critical evaluation of field methods

Drawing on the methodological position set out in Section 1 above, data collection was undertaken through the careful use of qualitative rather than quantitative field methods. In downstream Wadi Allaqi (including the area of Sayalla), six households were selected, differentiated by clan and by socio-economic status. A further three focus groups were selected from among Bedouin communities who have settled in and around Aswan. Five households were selected in Siwa. These selections were made to reflect various stages of sedentarisation and a range of different relationships to the natural resource base. In this way it was hoped to elicit information about the evolution of environmental knowledges and changing attitudes to natural resource management when households undergo the process of settlement and deeper engagement with the formal economy.

The research team divided into two for the visits, with the female researchers having discussions with women informants and the male researchers with Bedouin men. This division was necessary for cultural reasons. Non-family males are not permitted to enter the women's area in Bedouin settlements, nor are Bedouin women generally permitted to talk with non-family males. Even though women visitors can enter the male spaces in the settlements, conversations can be relatively inhibited compared to a wholly male occupation of that space. As far as possible, the two parts of the research team talked with men and women from the same family group, although this was not always possible. Over the period from September 2001 to July 2002, regular visits were made to each of these groups, with discussions focusing around the agreed checklist of key topics (Annex 1 of full report). The results of these discussions and other observations made were entered on the pro-forma data form (Annex 2 of full report), and were subsequently entered into the electronic database NVivo.

During each visit, discussions not only visited the issues on the checklist, but informants were encouraged to raise other points and questions. The emphasis was very much on trying to generate a conversational atmosphere. Ideally, all conversations would have been taped. This, however, was not possible as the informants were only too aware of what tape-recorders were and how they could be used. Indeed, some related to us experiences several years previously of the use of

tape-recorders by officials which resulted in some people's views being thrown back at them at a later date by the authorities. The tape-recording of conversations was not, therefore, an option. Writing notes during discussion similarly made the Bedouin feel uncomfortable. As an alternative, each conversation generally had a minimum of two, and a maximum of three, researchers present. Whilst one participated actively in the discussion at any one time, the other listened carefully to memorise as much of the conversation as possible. The researchers mixed up talking with listening as much as possible to make the conversation seem more natural and flowing. After the visit had ended, and the researchers had departed the settlement, information was immediately cascaded into notebooks and onto the field data forms (Annex 2 of full report). Whilst recognising the problems associated with this approach, it was necessary under the particular socio-cultural and political realities of the area. As a method drawing on the immediate memories of two or three researchers, it worked successfully and efficiently, and allowed researchers to challenge each other if it was thought that one of them had misinterpreted something said. The immediacy of this checking process, however, provides an efficiency that listening to tapes at some time afterwards cannot replicate, when the experience has become distanced in time from the body language, gestures and other non-oral elements of a conversation. These are still fresh in the mind and were used, where appropriate, to provide added depth and understanding to the results of the conversations. The unfortunate consequence of this is that the Bedouin voices cannot be heard directly in the written account of this study but must be mediated through the researchers' memories and words.

Observations were also made by the fieldworkers on each visit, enumerating adults and children in the settlement, as well as livestock. Discussions took place about recent visitors or events since the last visit made by the research team, and note taken of the condition of the animals, in particular indications of poor health such as diarrhoea. As relationships grew between the informants and the researchers, so the conversations became more relaxed and trusting. Cross-checking, or triangulation, suggests that the results of discussions have become increasingly secure. There are clear advantages in this sort of longitudinal work in the sense of obtaining information which is deeper and more nuanced, but at the expense of time and resource.

There were, however, some difficulties associated with the methods used, some conceptual, some practical. Of particular concern was the balance needed between researchers being too leading in discussions, and not being leading enough, resulting in too diffuse a set of information. Although direction was necessary, it was important that the voices of the informants were heard, that, as far as possible, they should lead and drive the conversations. This can be very time-consuming, but rewarding and wholly necessary in the context of this research. There is also the danger with this, however, that researchers may over-empathise with the informants, and may therefore not always distil the important message or information. Certainly as relationships grow during this type of longitudinal research, this can become an issue. On the other hand, the research benefits from this type of experiential situation are almost incalculable, and produce a depth of understanding and nuance that questionnaire surveys and one-off visits can never hope to emulate.

Related to this is the problem raised from working in a large team (four women and four men) and ensuring that the team always maintains its shared understanding of the key issues. This is further exacerbated by the team having to divide into two units to

undertake fieldwork, the women researchers working solely with women informants, and the men researchers likewise with male informants.

While separate male and female discussions are in nearly all cases a cultural necessity, this can lead to a further methodological concern for the comparative value of data thus gathered. Can all differences in the information gathered be attributed to the existence specific gender knowledges, or is it possible that discrepancies may result from differences in the way conversations are conducted? For example, men in conversation were rarely engaged in other activities simultaneously, while women were not always able to give their full attention to discussion with researchers when otherwise engaged with children or domestic work. Continuing dialogue between team members was therefore an important activity to reduce and control (or at least be aware of) such problems. In addition, the advantage of the focus group approach was that it facilitated a more 'natural' form of exchange than through a one-to-one interview. However, such discussions can become dominated by assertive individuals. While this may mean that all voices are not heard equally, this does, nevertheless, accurately represent the ways in which certain individuals and groups may dominate social realms more widely.

A final influence on the data collected in discussion with the Bedouin was the presence of a state security officer during some of the meetings with men at Wadi Allaqi. It was deemed necessary that foreigners in the desert be accompanied by security personnel. It may be that his presence inhibited discussion about the use of resources in sensitive areas (especially concerning the border with the Sudan), and more generally may have made the men more reluctant to talk openly. This constraint was not directly present in the context of women's discussions although the fact that the security officer arrived with the research team may have raised suspicion or concern among all of the Bedouin. On the other hand, the Bedouin are aware of the demands on travellers of the security services and so may not have seen this as a particularly unusual event.

5 Data analysis

The information and data collected, and recorded on the field data forms, was transferred into electronic form using QSR NUDIST NVivo, proprietary software produced by Qualitative Solutions and Research. NUDIST (an acronym for Non-numerical Unstructured Data Indexing, Searching and Theorising) is designed to handle qualitative data and to seek out consistent patterns, similarities and contrasts between different data sets. The principal application of the software allows for the easy and rapid sorting and comparison of data by different categories and sub-categories (for example, respondent name, gender, informant location or all of these). This also facilitates searches along pre-coded themes, or by using keywords (such as particular plant species or geographic locations). Essentially NUDIST provides an effective indexing system for data generated by the study.

Data were entered into the NUDIST software simultaneously as the field research continued. The rapidity and flexibility of the software in organising incoming 'layers' of data meant that themes requiring further attention, or important absences in the data-set, could be identified while fieldwork was still in progress. In this way, the

'real-time' management of data served to tailor ongoing research activity to optimum effect.

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