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Indigenous Knowledge: Towards Learning Materials and Methodologies that Respond to Social Processes of Marginalisation and Appropriation in Eastern Southern Africa

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Abstract This study sheds light on how a rich legacy of intergenerational, contextual knowing (indigenous environmental knowledge) was successively overlooked and marginalised, or was appropriated and re-orientated in developing scientific institutions, in eastern southern Africa. The Nguni case evidence reviewed, uncovers a somewhat blind appropriation[1] and reorientation of environmental knowledge in the colonial administration and within emerging scientific institutions. It examines how processes such as this served to marginalise indigenous "ways of knowing," and consequently, "African knowledge systems" in the region. Evidence of colonial oppression is nothing new, but a closer look at some of the institutional processes involved is used to inform the design of the "IK & Today," materials being developed with educators and communities by researchers working on The National Research Foundation (NRF) programme of the Rhodes University Environmental Educatiuon Unit.

Introduction

This study follows a recent review of developing educational methods and methodologies as these relate to indigenous knowledge and the school curriculum (O'Donoghue & Neluvhalani, 2002). It examines further evidence of how early Nguni socio-ecological "know how," mobilised and mediated in intergenerational community contexts, was overlooked, appropriated and reshaped in the widening colonial landscape of eastern southern Africa.

The paper probes diary records to review how, within early everyday Nguni interactions, to "know how" was implicitly to "know why." There was seldom an explicit need to ask "why"about things that happened in approved and sustaining ways within the patterns of everyday communal life. The primacy of the question "why" as rational explanation, increased with the vantage point of "curious outsider" narrating and explaining the novel practices of others. Processes such as this are central to administrators and now also to educators, who need to reason towards explanations that can be used in the rational exercise of various forms of mediating control.

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The paper traces processes of knowledge appropriation and reorientation that accompanied the colonial marginalisation of the Nguni. In doing so it uncovers how specialist institutions have come to hold and to deliver knowledge from outside of everyday life. The study notes, for example, how social institutions have come to designate communities as target-groups for educational messages communicated through campaigns that set out to change the behaviour of individuals and communities.

The legacy of Apartheid, and assumptions implicit in the social politics of specialist knowledge creation and mediation, can make it extremely challenging for marginalised indigenous peoples to make meaning of, and to steer, daily life choices. Many communities are, for example, often suspicious of, or are torn between "what they are told" by authorities and "what they hold to be true" in daily life. Current more participatory approaches to education and development that claim to take community perspectives into account, are still little more than smoke screens for the imposition of expert ways of knowing and seeing things. Educational processes such as this often involve a facilitative holding back of expert ideas, in the confidence that participants must eventually grasp what are already known to be the facts of the matter.

With greater insight on some of the processes of marginalised "indigenous knowers" and their "capital of environmental knowing," this review attempts to shed light on possible ways of fostering better school-based meaning-making interactions. This is done in the hope of noting how learners might be able to use what they know, along with fragments of a rich indigenous knowing that might have been lost to them, to make more sense of what they see / experience in the world today.

Nguni Ways of Mobilising Knowledge In and About the World

The Nguni cattle peoples of eastern southern Africa had diverse ways of sustaining daily life in their home environments. Their ways of seeing and doing things developed as the landscape was shaped by their use of hoe, axe, fire and patterns of hunting and driving out wildlife to sustain themselves, their pastures and their cattle. The environment and sustaining ways of knowing what, when and how things were to be done, developed and changed over generations of social interaction in the region. The Nguni cultural capital had thus come to "mobilise"[4] the world in sustaining ways of knowing within which people came to know what to do when confronted by the opportunities and risks of daily life.

The nagana cattle disease was, for example, a continuous cyclical threat that was held at bay by patterns of hunting and driving to clear the land of wildlife. Day to day and seasonal practices created and secured cattle pastures by clearing the land of large game, the host animals of the nagana parasite that was transmitted by the tsetse fly. Prior to colonial intrusion it appears that the Nguni had successively cleared their land of the nagana cattle disease. Developing patterns of the hunting and driving out of wildlife thus came to sustain communal harmonies although these were from time to time disrupted by isolated outbreaks of the nagana. The disease seems to have occurred within the approximately ten year cycles of tsetse fly population increases that were regulated by climate and a parasitic wasp.

Early Know-How

Evidence that the Nguni had so mobilised the world to develop a capital of sustaining ways of knowing what to do are to be found in common-sense practices that were taken for granted in the patterns of everyday life. Bishop Colenso, an early colonial missionary describes traveling through Zululand, encountering buffalo and noting how

the message went out to mobilise the community to hunt for meat and to drive out the threat to cattle and pasture. He wrote in his diary:

> Saturday, Oct. 8th. – We started by break of day, before breakfast, and went on for the um Hlatusi. A buffalo was seen this morning, and the natives were hurrying from the neighbouring kraals to hunt it. The windings by which we descended to the um Hlatuzi seemed interminable. ... Our guide had brought us to a wrong place. ... There was no sign of a path for some time, and it was rather awkward, wandering about with two wagons in the bush which we knew abounded with buffaloes, of which, indeed, the traces were visible enough as we went. However, at last the track was hit upon, and we climbed slowly up the steep height ... (Edgecombe, 1982, pp. 132-33)

His record suggests that he had little or no sense of the socio-ecological wisdom in and cultural significance of these practices. Magema Fuse, a young student travelling with Colenso wrote in his diary of the same journey:

> We trekked, we crossed the Umhlatuze, where there ... were many buffaloes. Jojo and John collected dry dung, and grass which is eaten by the buffaloes; they lighted a fire, there was smoke there, they made it smoke upon the oxen. (Edgecombe, 1982, p. 169)

Magema reports how the students had the confidence of knowing what to do. In effect, they created a smoke screen between their cattle and the buffaloes / tsetse fly. Today scientists tell us that tsetse, a blood-sucking fly that transmits sleeping sickness (nagana), hunts mainly by sight, landing on the shaded underside of its prey. They also say that in a similar way in which ticks drop off grass and hide in cracks in the ground as an adaptation to survive bush fires, so tsetse would either cling to the fleeing buffalo or fly off to the protection of moist forests in the river valleys where they live and breed.

Seeing the students preparing the fire, the Bishop appears to have asked what they were doing, seemingly puzzled that, on a hot day, they were making a fire. Magema reported this in his diary:

> Sobantu (Bishop Colenso) enquired and said, "What is this? What are you doing it for?" They said, "Why this now, people do it so that, when cattle arrive at the place of others (wildlife), they may not come to take their sickness". (Edgecombe, 1982, p. 169)

The Bishop's diary account makes no mention of the strange activities of his students, suggesting that he had little or no insights into an underlying wisdom, perhaps thinking it was some sort of superstition. It is also of note that, in knowing what was to be done, there was no demand and no evidence of a language capital for explaining why in an explicit analytical way. Applying ways of knowing "what was to be done" had worked over generations with no need to explain why, so the means of doing so did not exist. Knowing why was thus embedded in the common-sense practice and what was to be done was simply explained to the Bishop, a trusted outsider.

Widening Misunderstandings

As societies began to mix and to merge on a more global scale, the Nguni environments of southern Africa were first visited and then successively colonised by outsiders. During this turbulent period, patterns of imperial conquest had the outsiders come to dominate and to regulate the indigenous people. With this power and call to regulate others came patterns of somewhat blind marginalisation and an associated appropriation of knowledge and power to administrative and scientific institutions. The developing story is characterised by patterns of misunderstanding and misrepresentations through which much of the capital of Nguni cultural wisdom was overlooked, suppressed, appropriated and overshadowed as new ways of knowing came to be held in developing administrative and scientific institutions of social control.

Simply put, colonial administrators sought to maintain a controlling hold over the people as they developed confidence in their ways of seeing things. This affirmed the utopian ideal that indigenous people lived side-by-side and in harmony with wildlife. The indigenous people, on the other hand, sought to maintain their own sustaining harmonies that involved hunting and driving out wildlife so as to protect their pastures and cattle, a sustaining process that had over time minimised the nagana cattle disease to the margins of the abundant grasslands of Zululand.

With traditional patterns of hunting and driving being suppressed by the colonial administration, the nagana cattle disease re-established itself in the region. Uncertain and worried about the developing problem, the colonial administration asked the people what they knew about the nagana and what could be done. The administration documented what the people said as follows:

> The natives attribute the increase of the nagana to the increase of large game under the protection afforded by the government. They state that nagana has now made its appearance in localities where it has hitherto been unknown to them; that in the time of the Zulu kings where new tracts of country had to be occupied, where there was large game, it was found that cattle moved to these localities died of nagana and large hunting parties were therefore organised to destroy the large game and or drive it to uninhabited localities, and the disease disappeared with the game, but made its appearance again on the return of the game. That, eventually no attempt was made to occupy new localities without clearing as much as possible of the big game. (Pringle, 1982, p. 111)

Here the voice of the indigenous people is heard through the eyes and in the words of an outsider, in an attempt to clarify how the people explained the problem. Simply put, in translating the indigenous explanations of the "what and how" of matters to answer the administrator's need to know why to explain the problem, many misunderstandings were constructed. This cultural transformation made indigenous ways of knowing appear somewhat stilted, simplistic and vague. None of this mattered much, however, because what had been said by the Nguni about the need to hunt and to drive out wildlife was interpreted as a blood lust for hunting and a hunger for meat, something that the colonial administration was trying to keep under control.

To resolve the nagana problem, the colonial administration turned to science. Science then turned to the microscope, a relatively new technology for making the invisible visible. The microscope provided Surgeon General David Bruce with a new vantage point for mobilising the world of microscopic life, the hitherto invisible that had been outside human experience. Within a year of enquiry, observations and experimentation Bruce concluded that:

> Trypanosome was the cause of nagana, wild animals provided the reservoir for this parasite and tsetse flies transmitted the parasite from infected to healthy animals. (Pringle, 1982, p. 112)

The new knowledge was inscribed in explanatory scientific terms somewhat abstracted from the everyday. Scientific processes of hypothesis formulation, observation, experiment and prediction had come to mobilise the world in ways that explained why. These superseded earlier ways of making meaning in the world, mobilising a powerful capital of knowing about and why, to inform what was to be done.

What is often overlooked here is how knowing about the nagana was appropriated by scientists and institutions that came to inform and to guide the colonial administration. In this way, outsiders came to know more and better than those confronted by the problem. Indigenous communities were excluded from direct access to the new knowledge, were excluded from knowledge creation processes and thus had

to get on with what they knew or look to outsiders to be informed about the problems that confronted them.

The Indigenous Foundations of Ecology

The next fifty years had scientists and specialist institutions beginning to dispense much of the capital of environmental knowledge necessary for sustaining ways of knowing. The earlier landscape of the Nguni cattle people surrounded by wildlife was inverted to island nature reserves surrounded by people on a rapidly degrading rural landscape. These green islands became sites of scientific engagement and a progressive mobilising of the world of ecological ideas that was to become the symbolic capital for developing notions of conservation and environmental education.

Latour (1999, p. 100) describes processes such as this as:

> ... a matter of moving toward the world, making it mobile, bringing it to the site of controversy, keeping it engaged and making it available to arguments.

He suggests that:

> If we want to understand why these people begin to speak more authoritatively and with more assurance, we have to follow this mobilisation of the world, thanks to which things now present themselves in a form that renders them immediately useful in the arguments that scientists have with colleagues. (Latour, 1999, p. 101)

In this study I give attention to the interaction between Nguni ways of knowing wildlife and processes of interaction between game guard (Magqubu Ntombela) and game ranger (Ian Player) in the development of the Umfolozi Game Reserve.

Magqubu Ntombela, an early game guard in the Umfolozi Game Reserve, described how the government removed his father from Ongeni at the height of the last nagana outbreak in 1945. Player reports Magqubu stating that:

> ...They said that when the nagana was over we would go back, but it was not allowed. (Player, 1997, p. 84)

The important story here is not how the nagana led to the forced removal of people from wild areas to create some game parks, but how the account of mobilising patterns of interactions provide a window on processes of appropriation and the transformation of indigenous knowledge. Player describes:

> While I carried my notebook and pen, looking and writing down and in so doing detaching myself, he absorbed it all because this was his world and every living thing was a neighbour. (Player, 1997, p. 90)

Like Player, many early game rangers (Steel, 1968, for example) describe how indigenous game guards and experience in the wilds were their teachers, allowing them to develop the capital of knowledge necessary to manage the nature reserves under their protection. In interactions such as this, knowledge of nature and its conservation was progressively constructed amongst game guards, game rangers and ecologists. Game rangers held an early ascendancy in the knowledge stakes with an intimate knowledge of the interdependence amongst wild things being derived from interactions in wild areas in the company of game guards.

The developing capital of knowing from wild areas was thus appropriated from Nguni naturalists. It was then reframed as developing ecological knowledge as succeeding generations of natural scientists "cut their teeth" in the company of indigenous African game guards and learned the new ecological sciences in universities. Here one has the interplay of Nguni cultural capital and local knowledge of the interconnected ways of

the wild and game ranger scientist as interpretative mobiliser of ecological "patterns that connect".

As these processes developed this century on a globalising scale so one has a more and more reality congruent capital of ideas being differentiated in the habitats and ecosystems of the world. Simply put, the ecological sciences have been constructed around the notion of interdependence, "the patterns that connect". Fortunately for us today, early naturalists were able to learn with and from indigenous African naturalists with intimate knowledge of patterns of interaction amongst plants and animals in their surroundings. Player reflects on how Magqubu detailed these patterns of interdependence with him.

> "Woza, look here", Magqubu said, beckoning me to an mpafa tree. He described how small antelope like the grey duiker and steenbok eat the leaves on the lower branches. Slightly higher the impala eat the leaves; nyala antelope browsed at the next level, but like the impala they too fed on the tender branch shoots. Next came the kudu. Magqubu put his hands up behind his head to show how the great kudu bull with its lyre-shaped horns came slowly to the tree, nibbled on leaves, and when the branches were bare put its head into the tree, twisted its huge neck, and broke the higher branches. Some fell to the eating height of the small grey duiker and the steenbok. He brushed dry grass aside, and pointed to the faint V imprint of a duiker's hoof.
>
> "The kudu works here for the other animals, the duiker and the steenbok. But the warthog and the ngulube [wild pig], they cannot reach up high, so they feed on fallen leaves."
>
> He pointed to a big branch which the kudu had broken and which now lay stripped bare on the ground.
>
> "The eland, it eats the branches and the leaves and again some fall onto the earth to help the other animals," he said. "Right at the top of the tree the giraffe eats the leaves, branches and the thorns."
>
> He made a sweeping movement with his head, opened his mouth and showing how the giraffe with its long neck could eat any part of the tree, slide its big lips or curl its tongue, and strip leaves, thorns and the softer parts of the branch. "Indulamithi", Magqubu said. This is the Zulu word for the giraffe, "he who is taller than the trees." (Player, 1997, p. 88)

Unfortunately, the developing depths of ecological knowledge, constructed from early interactions, were soon both distanced from, and denied to, the very people who had been the source of the earliest sense of the webs of interdependence amongst wild things in southern Africa. The link between Nguni indigenous knowledge of the wilds is still to be found in the common-sense underpinnings of ecological thought, namely form and function: "What things are like and how they work". In a similar way the fragments of Nguni knowledge are to be found in the other founding proposition of ecology, distribution and abundance: "Where things are and how much and how many of them there are".

The contextual answers to all of these questions were first to be found in the accumulated wisdom of the ways of the wild amongst local indigenous people. Player, in utopian mood, describes his interactions with Magqubu as:

> Walking behind him I was absorbing knowledge through a process of osmosis, example, and imitation. (Player, 1997, p. 76)

Work together in the wilds and amidst differing ways of seeing things appears to have been mutually enriching in the case of Ntombela and Player. Early interactions such as this were, however, soon superseded by a developing industry of scientific knowledge creation.

Scientific Co-option and an Inversion in Focus

Scientific ways of mobilising the world were developed using detached methods for ensuring the greatest possible certainty of ideas. Research methods make a point of not acknowledging what people think or claim to know, the culture of scientific enquiry requiring that this be reformulated as an hypothesis to be tested in ingenious ways where researchers count, measure and build theory to explain how the world works. In the modern era the ecological sciences have been constructed and reconstructed in this way at study sites all over the world. Theory building has progressed through "form and function" to explain "distribution and abundance", and then on to the construction of descriptions of life sustaining "systems and processes". More recently, as remote sensing technologies have developed, much of this accumulated capital has been used in the new field of landscape ecology that has enabled us to look at recent processes of landscape change and biodiversity loss.

Ecology and the nature conservation scientists superseded the game ranger and game guard into the 1970s with the advent of nature conservation science. Of note here is how the focus of knowledge creation shifted from sustaining human communities (Nguni communal conservation) to sustaining nature at risk so as to reduce human impact on natural resources (scientific nature conservation). This change is most noticeable in the developing science of ecology.

In contrast to earlier processes of mobilising ways of knowing the world to sustain people, the vantage point of the new science became the understanding and sustaining of wild nature against the threat of people degrading natural resources on a widening scale. The concern here was still with people, but the way of mediating this was indirectly through nature and its life support systems, an inversion in perspective against that of existing Nguni cosmologies.

The shift to a scientific cultural capital with nature as subject, a place previously held by people in community, has shaped an environmental common sense that we now take for granted. It is of note, however, that there have been profound changes, namely:

- a shift in focus – from community in context to natural systems;
- a change in the fabric of meaning - explaining why against knowing how; and
- what counts as meaning making – people in everyday contexts to outside expert in specialist institutions.

Developing social processes have thus changed the ways that we have come to know and to explain things. In the emerging story much of the indigenous capital of wisdom has been overlooked, marginalised and appropriated into scientific institutions. The fragmentation, marginalisation and transformation of indigenous ways of knowing must be taken into account in any curriculum methodology wishing to foster a critical engagement with indigenous knowledge in the present day.

Synthesis

Interesting patterns of appropriation and reorientation of environmental knowledge have developed in southern Africa. The developing processes came to marginalise indigenous peoples, to exclude them from developing knowledge institutions, a process that was compounded by the Apartheid system of separate development and Bantu Education. The story of marginalising reorientation might be summarised as follows:

- in early Nguni ways of knowing, there appears to have been a "know-how" within which the "why" of matters was implicit in the what, when and how to be done;

- indigenous knowledge was often seen as simplistic and vague to outsiders as they struggled to re-interpret contextual know-how statements into rational explanations of why;
- a scientific mobilising of the world developed in ways that made the why of matters more explicitly satisfying to the colonial administration. Indigenous peoples had little part in, and no access to, this reoriented perspective and any new knowing flowing from and associated with it;
- the colonial administration became empowered with the certainty that it knew more and better than indigenous communities; and
- environmental perspectives were inverted to put nature first, with people seen as a threat.

100 years of colonial intrusion involved not only conquest by force of arms but profound and radical disruptions of ways of knowing. To compound this, the indigenous were effectively marginalised from access to a developing symbolic capital for living in the modern world. To add insult to injury they were also subjected to a succession of education interventions intended to regulate their behaviour.

The globalising environmental sciences and associated scientific institutions did not single out African ways of knowing for particularly harsh and marginalising treatment. Similar processes, or knowledge reorientation, had earlier been enacted in other cultural settings but not on the scale and magnitude that was here exacerbated by colonial oppression and the continuing shackles of Apartheid.

An Inter-Epistemological Re-Appropriation in the Challenges of the Present Day

Science and scientists have, until recently, been relatively blind to how processes of scientific meaning making have dominated and marginalised other ways of knowing. Recently, increasingly reflexive scientific processes have noted that many of the problems in the modern world are also an outcome of the blind and dominating application of science. Scientists have also been notoriously poor at grasping this in such a way that they clean up some of the environmental mess that has disrupted and degraded biodiversity and the life support systems and processes of the planet.

Beck (1993) points to how scientists and the sciences may have, at times, been more wrong and damaging than right and useful in our modern "risk society". When confronted by evidence of how science and scientists have caused many of the current environmental problems, a developing disenchantment could have us "shoot the messenger" (scientists) with scant regard for how the message (scientific knowledge) may be right or useful.

In uncovering these challenges Beck illustrates how, for example, the local knowledge of farmers proved to be closer to the facts of the matter, despite scientists having initially dismissed their perspectives as fallacious. Beck does not go to the extreme of rejecting either farmer knowledge in context, or that of the sciences, but points to the need for more cooperative work in context. Here people and their ways of knowing are acknowledged by science for a wisdom that may embody the most practical ways of knowing and doing things in a given situation. An applied and contextual reorientation of much of what is today seen as the scientific facts of the matter would appear to be one of the meaning-making challenges for the next decade in our risk society.

Odora (2000, p. 101) notes how African "environmental knowledges", as contextual ways of knowing in Africa, have been rendered inaccessible and irrelevant (marginalised and appropriated) within the scientific character of western scientific and education

systems. She notes that there is a need to pay careful attention to the "insurrection of subjugated knowledges", (re-appropriation of the suppressed, marginalised and appropriated) including knowledge "buried under the yoke of formal systematisation" (the appropriated/ transformed). Commenting critically on the systematising of knowledge in schooling, she notes a trend in which environmental knowledge in/of Africa is becoming limited to environmental problems being seen in ecological, physical and technical ways, notably soil loss, the disappearance of forests, the extinction of species, the expansion of deserts and the pollution of rivers, (all detached narratives of a developing conservation science perspective). Her notion of the "insurrection of knowledges" is useful for examining the social politics of knowledge creation and the prospect of a re-appropriation of environmental knowing, in local contexts and for the steering of everyday social life.

Towards a Curriculum Perspective

The important point for environmental education processes is a realisation that much of the early indigenous knowledge in, and of, the region is at the root of what has become part of scientific environmental knowledge today. Also, as we have seen earlier in the case of the nagana, much of the common-sense wisdom of old has remained unseen on the margins and awaits re-discovery. Many early ways of knowing have also been overturned and clarified. These realisations suggest that there may be useful fragments of earlier indigenous knowing embedded in the sciences just as there are fragments of earlier ways still held in indigenous communities. Much of this knowledge is now mythical memories and abstract ideas, both disembedded forms awaiting re-appropriation into sustaining ways of knowing in the world today. The developing stories suggest that the re-appropriation of an indigenous capital for sustaining ways of knowing may require a parallel mobilising of:

- a sense of sustaining ways of old still held within an indigenous cultural fabric in many community contexts; and
- ways of knowing that are now embedded in and have been transformed within the cultural fabric of the sciences.

The critical juxtaposing of ways of old, outside ideas and the challenges in the present day is nothing new. Nguni societies, not unlike other groups all over the world, did this implicitly in the past and still do today. There are, for example, high levels of regional variation in ways of doing things, notably the construction of grain storage baskets and pits. Also, use and adaptation of these and other technologies, notable in the fairly recent introduction of maize to the region, is evidence of interaction with outside ideas and change to new ways of knowing and doing things.

The accumulating evidence points to a need for education processes that bring indigenous and scientific ways of knowing into engaging tension amongst learners in our schools. This would appear to necessitate:

- the mobilising of fragments of early sustaining wisdom;
- an interpretative engagement to reveal the depth of wisdom in these processes; and
- engagement in the present challenges in ways that mobilise all ways of knowing that are likely to inform sustaining life-style choices and better patterns of environmental management.

An open process such as this might enable the mobilising of a capital of indigenous knowledge into school curriculum contexts and in school-in-community interactions (Figure 1), each stimulating and supporting the other in classroom contexts of teaching and learning.

Recent work with teachers (Masuku, 1999) has shown how learning materials brought in from the outside served to enhance the search for, and interpretative re-appropriation of, indigenous knowledge in a local community context. These meaning-making interactions appear to have been enabled and enhanced by scientific insights and bilingual interpretative interactions that explored diverse cultural perspectives in an environment of mutual trust and respect.

Working with Learning Support Materials Into and In Context

For enabling methodological perspectives we are beginning to examine ways of mobilising, acknowledging and supporting processes of contextual meaning-making in the school curriculum. "IK & Today" is a simple design incorporating the following ideas:

- "IK" as told in Mother Tongue (Zulu);
- "Interpretative text" that probes implicit and underlying wisdoms; and
- "Today", a text that challenges learners to begin to use this capital by using what they know to make sense of what they see and do in the world around them.

The developing educational perspective is to:

- work "into context" with examples and at the same time "in context" to bring forth local nuances and what might be unique to a given context; and
- use both mother tongue centred on contextual authenticity and English as interpretative text. This can create a multi-cultural curriculum context within which cultural significance and sustaining insights might come to coexist in ways that promote identity and mutual respect.

Perhaps the use and development of learning support such as this might begin to bring forth a new African endogenous knowing, successively re-growing in meaningful ways that are relevant for the resolution of many environmental problems in and of the everyday.

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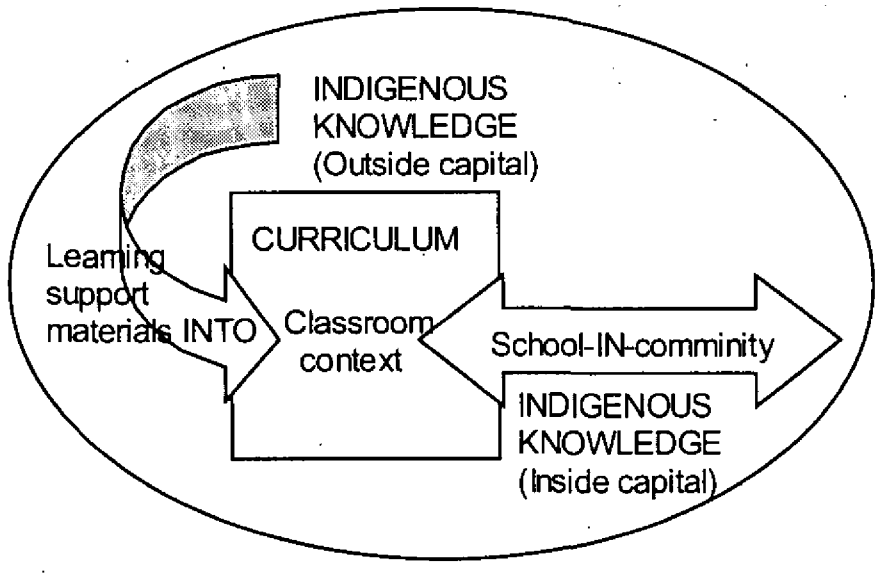

FIGURE 1: IK into and in school-in-community contexts

comments. The purpose of the exercise has been to inform the design of resource materials and to clarify a conceptual capital for making more of indigenous knowing in environmental learning activities in the school curriculum. I am grateful to Zanele Xaba (co-ordinator), Sanele Cele, Bridget Ringdahl and Nathi Ndlovu, the Share-Net team who contributed to the redevelopment of the "IK Series" into the pilot versions of the "IK-Today" learning support materials for continuing research with educators.

Keywords: indigenous environmental knowledge, development of environmental education materials

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Endnotes

1. A useful term used by Antony Giddens (1991) for grappling with ownership (property) and control (power) over knowledge in changing patterns of social and institutional balances of power.
2. This term was derived from the work on the sociology of science by Bruno Latour, 1999. It is used quite widely and loosely in this text for interactions that become meaning-laden in social contexts and are then used in the steering of social interactions that serve to shape and sustain communities.