Chapter V
Transformative Science: From Muthi to Chemical Compound

> I am not interested in the spirit, I am only interested in the molecule.
> Dr. Matsabisa, IKS Lead Program

Introduction: "We Go beyond What They Know"

The PhD student and pharmacologist-in-the-making James Mukinda, who, as a visiting researcher, occasionally conducted pre-clinical trials using the IKS Lead Program Laboratory's Liquid Chromatography-Mass Spectrometry (LC-MS) facilities, summarized in brief what this chapter is concerned with:

> Traditional medicine understands from experience, but they [traditional healers] don't know why things work the way they work. That is what we do. We go beyond what they know. Many chemical compounds do not dissolve in water. Many healers, particularly in remote, rural villages, only use water as a dissolvent for plants. But often they need alcohol for splitting up the chemical compound's properties. So, what we do here in the lab is to go beyond their knowledge. Only healers in urban areas have access to other dissolvents. Every compound has a different need as a dissolvent. Until now, we are in the phase of speculation in terms of traditional medicine. This is why I do not believe in traditional medicine. People believe that medicinal plants are safe. They have hope in these plants. So what you now need is deep science to prove the safety. (Excerpt from interview, IKS Laboratory, January 2010)

This chapter continues with the trajectory of medicinal plants and associated (indigenous) knowledge from their place of origin into a biochemical laboratory, and is concerned with the moment in which indigenous knowledge and medicinal plants meet scientific knowledge and practices. In the chapter, I dive into what James Mukinda defines above as "deep science" and "the phase of speculation," with the first attempting to 'overcome' the latter. In this trajectory from *outside* to *inside* the laboratory, medicinal plants and associated knowledge change their meaning, con-

tent and value. This chapter therefore sheds light on how laboratory practices and knowledge(s) transform plants and indigenous knowledge by means of scientific, technical, symbolic and political practices (Knorr-Cetina 2001) into objects of bio-value (Waldby 2002) for the pharmacological and economic market. In the tradition of Science and Technology Studies, which in the 1980s engaged in "studying science practice, what scientists actually do" (Pickering 1992: 2) and witnessing "science in action" (Latour 1987) see also Garforth 2012), I investigate the practices, materials and knowledge that scientists use in the scientific process of medicinal plant analysis, which involves networks of non-human actors – i.e. plant material, gravity columns, dissolvents and HPLC (High Performance Liquid Chromatography, or High Pressure Liquid Chromatography) techniques – as well as human actors – i.e. scientists, healers and the government.

Despite Watson-Verran and Turnbull's claim that "[t]here is no term in general usage that adequately captures the amalgam of places, bodies, voices, skills, practices, technical devices, theories, social strategies, and collective work" (1995: 117) that come together in scientific practices, the term 'assemblage' (Deleuze & Guattari 1997) might be suitable to bring all human and non-human actors together under one umbrella term and give space to the IKS Laboratory as "an agent of scientific development" (Knorr-Cetina 2001: 144). But how exactly is this assemblage constituted? The assemblage unleashes perceptions, expectations and hopes that actors maintain about the translation and transformation of indigenous knowledge and medicinal plants into new chemical compounds and therapeutic uses for these compounds. Knowledge, plants and the transformation process are therefore not seen at as neutral and objective, but are loaded with challenges and ambivalent opinions. So which "tribes of scientists" (Latour & Woolgar1986: 17) and other actors are involved in these processes, and what do they really think about the integration of traditional knowledge into science?

Given the fusion of two knowledge systems and divergent materials and the ambivalent opinions and values that come together in the IKS Laboratory, I argue in this chapter that scientific knowledge in this context ought to be seen as a local knowledge system with specific values (cf. Watson-Verran & Turnbull 1995). In this chapter, I will look at the values that are produced and changed in the laboratory and under what conditions. This is particularly interesting because among the highlighted goals on the agenda of the IKS Lead Program are the promotion and support of indigenous knowledge systems, thus it is interesting to question how far indigenous knowledge systems are in fact promoted and supported, and by whom. In addition, in the chapter I will also look at other assignments of the IKS Lead Program, namely the educational aspect and the job creation and poverty alleviation assignments. How do these assignments contribute to knowledge production, as well as to the putative goal of the IKS Lead Program to promote and support indigenous knowledge systems?

The Indigenous Knowledge Health System Lead Program

The Indigenous Knowledge (Health) System (IKS) Lead Program is a sub-unit of the Medical Research Council (MRC), one of the leading South African governmental medical research institutions. It is located in the northern suburbs of Cape Town, next to Tygerberg Hospital, the largest hospital in the Western Cape and the second largest in South Africa. The IKS Lead Program was established in 2000, at which point it was fully incorporated in the MRC. As a governmental institution, the existence of the IKS Lead Program followed the political decisions and directions of the South African government[1]. Especially with the promulgation of the IKS Policy in 2004, this led to a number of new institutions dealing with indigenous knowledge systems, among them the IKS Lead Program Laboratory, erected in 2004/5.

To fulfill the mandate of the South African government, as proposed by the IKS Policy (2004), the IKS Lead Program flagged four priorities: 1) research, discovery and development, with a special focus on developing drugs for malaria, tuberculosis, diabetes, cancer and HIV/AIDS; 2) knowledge development and knowledge management, involving the training of students, communities and traditional health practitioners; 3) the utilization of IKS Lead Program scientific research results, and the development of strategic business plans and cooperation with companies to commercialize the research products; and 4) the application of the social impacts of the IKS Lead Program's findings in public-private community partnership projects to establish sustainable community business enterprises for wealth creation, technical skills development for job creation and poverty alleviation[2].These priorities reflect the activities of the IKS Lead Program, reaching from the biochemical and pharmacological analysis of medicinal plants to the promotion and support of indigenous knowledge systems, from community projects, local development and poverty alleviation programs to giving policy advice to the government. In its scientific mandate, the IKS Lead Program Laboratory follows general drug development guidelines, which comprise: basic research, including collection, extraction, screening for bioactivity and the identification of active compounds; development, which includes identifying bio-validity, analysis and standardization; the validation of efficacy and safety, which includes clinical trials; and upgrading and pharmaceutical development, with the latter including manufacturing and the patenting process. The main focus of the laboratory, however, is on basic research

1 In 2012, the MRC South Africa discussed whether some research units should be closed down due to the lack of funds (see: www.iol.co.za/news/south-africa/western-cape/mrc-vital-research-units-could-close-1.1393300#.Uayp5JxGBCo). The IKS unit was subject to a larger restructuring process of the MRC in 2014.

2 www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=26715&P_ForPrint=1 (last accessed February 20, 2015).

and drug lead development. Clinical trials, upgrading and pharmaceutical development are mainly outsourced to other academic institutes or (biotechnology) companies.

The actual biochemical analysis of medicinal plants ensues at the IKS Laboratory. About 20 kilometers from the MRC headquarters, the IKS Laboratory lies in the heart of the Drift sands Nature Reserve. Drift sands is a protected area under the management of Cape Nature, a public institution with the statutory responsibility for biodiversity conservation in the Western Cape[3]. The objective of the Drift sands Nature Reserve is "to transform a nature reserve in the centre of one of the poorest and most densely populated areas of the Western Cape into a safe, multipurpose urban reserve and a treasured community resource"[4]. The MRC Delft Centre, a huge industrial compound containing MRC facilities, with the IKS Laboratory being just one of them, is part of an urban development scheme that aims to integrate business into poverty stricken areas.

In the following section, I will describe my arrival at the MRC Delft Centre and the IKS Laboratory and recount some of my impressions when I entered the laboratory for the first time, and how these impressions manifested and/or changed over the year.

An Ethnographer at the Laboratory

To reach the IKS Laboratory from the MRC headquarters, I took the R300 freeway that cuts through the Cape Flats and separates the more affluent northern suburbs from the poverty stricken township area. From R300, the turnoff at Hindle Road leads through some squatter shack settlements on the one side and green sandy hills on the other to the entrance gate of the MRC Delft Centre. According to the sign at the entrance gate, a number of other companies and institutions, such as waste management and laboratory animal stables, also reside on the hidden compound. From outside the center, secured with huge barbed wire fences and a security guard at the entrance, I was reminded of the compound's military past, as well as of the generally strict security obligations I often had encountered in South Africa.

Inside the gated compound, a tranquil and almost harmoniously arranged settlement of laboratory and office buildings created a strange atmosphere of busy occupation and total isolation. Every time I would enter the compound in the coming year, I would be struck by this ambivalent feeling of nothing happening at all, combined with the knowledge that here was located a highly innovative business and science hub. When I arrived at the laboratory to start the research in February

3 www.capenature.co.za/eco-tourism.htm?sm[p1][category]=718 (last accessed February 20, 2015).
4 www.openafrica.org/participant/Driftsands-Nature-Reserve (last accessed February 20, 2015).

2009, I left the lively atmosphere of the densely populated Cape Flats behind and managed my way through the entrance gate, equipped with an invitation from Dr. Matsabisa, Director of the IKS Lead Program. Prior to my arrival, the IKS Lead Program had, together with the Institute of Social and Cultural Anthropology at the Freie Universität Berlin, signed a Memorandum of Understanding (MOU), which proposed a focus on conducting research at the IKS Lead Program Laboratory. I entered the isolated industrial area with its laboratories, horse stables, medical waste management factory and a building housing velvet monkeys. Velvet monkeys are invaluable for scientific research and pre-clinical trials, and, as I learned later, they also served as 'scientific currency' in negotiations between the IKS Lead Program and Guangzhou Traditional Medicine Hospital.

I turned right, traversed an alley of blue gum trees, turned right again, passed a small café and stood in front of the medium-sized brick one-storey building with a green tin roof. Opposite the building, behind a wooden fence, was a tiny but neatly arranged garden, with small patches of differently labeled medicinal plants with name tags in isiXhosa, isiZulu, seSotho, English, Afrikaans and Latin, and a crafted wooden table and chairs under a thatched roof. Above it all towered the mast of a high-power floodlight, another reminder of the compound's military past (cf. Green 2008). Later, I would learn that some of the plants in the little garden were endemic to South Africa, while others were botanical migrants from other parts of Africa, as well as Asia and Latin America. The medicinal plant garden served as a rearing ground for plants investigated at the laboratory, as well as an educational site to teach visitors, notably young pupils from the Cape Flats, about medicinal plants.

Dr. Matsabisa awaited me in his office in an office building separate from the laboratory. Straight after my arrival, he took me for a walk through the vast laboratory and introduced me to the other scientific and non-scientific staff members as his "new PhD student." He explained the functions of the different areas of the building and of the technical apparatus, and gave me a taste of a bitter plant powder. "Usually," he explained, "we anonymize the plants we are working with. All plants we use in the laboratory are abbreviated with P21, 22, 23 and so on." But then he revealed the name of the bitter tasting plant as *Dicoma anomala*, a common ground-creeping plant from South Africa. Later, I would learn that the plant was being tested in vitro for its antimalarial properties and that an active compound had been isolated and characterized[5]. Finally, Dr. Matsabisa offered me a desk and a computer in the scientific staff office.

The easy introduction and my fast integration into the research team astounded me (cf. Knorr-Cetina 1999; Garforth 2012). I had expected more questions regarding what exactly I wanted to do and why I had chosen the IKS Laboratory to conduct

5 See: http://innovation.mrc.ac.za/malaria.pdf (last accessed October 12, 2015).

research. But obviously, the IKS Director considered the research proposal and the MOU sufficient to know my intentions. Dr. Matsabisa was a pharmacologist and politician at heart; social science research was probably not of much relevance to him. Nevertheless, he had invited an ethnographer to conduct research at the laboratory. Perhaps he was interested in gaining a reputation for cooperating with an international university, or perhaps he saw the need to investigate questions about access and benefit sharing that arises from the scientific investigation of medicinal plants. I could, however, never fully figure out what his motivation had been.

Beyond the friendly, assertive introduction, another first impression I had was of the somehow lifeless and empty atmosphere of the laboratory. I could not help thinking that it was more of a showroom than an active laboratory, an impression that would stay with me for the entire year. Julie Laplant described a similar feeling after she had spent a few days at the laboratory as part of her research on *Artemisia afra* (*Umhlonyane*). In her book 'Healing Roots. Anthropology in Life and Medicine' (2015), she said:

> (…) the laboratory did not seem completely real. It was real in a sense of it being there, with all its magnitude, yet it did not seem alive in the sense of a real place to make medicine available to the people who would need it. The Delft facilities seemed to serve the purpose of showing businessmen a good investment that could be made there (Laplante 2015: 89).

This impression was fueled by the vast, state of the art laboratory with its fully equipped laboratory rooms, storerooms, offices and meeting rooms, and the large plantation site behind the building, all well maintained but somehow untouched and overly shiny. Most of the spacious laboratory remained unlived in, even untouched most of the time. A few young researchers worked behind the screen of the HPLC machine, and later, after its installment, behind the screen of the LC-MS machine, but most of the rooms and devices remained unused.

In total, six Bachelor and Master students and three post-doc researchers were working at the laboratory when I arrived. In addition, a general janitor, two cleaning ladies, and the coordinator of traditional healer-related activities, were employed as non-scientific staff members. All IKS staff members were of black origin (Xhosa, Zulu, Pedi, Ndebele, Basotho and Tswana). The only white staff member was a specialist engineer, who was employed to supervise the LC-MS facilities and to introduce and help visiting researchers, who occasionally came from other research institutions with their own medicinal plant extract samples. The average monthly wage at the laboratory was 5000 Rand – for those who were paid. Most of the young researchers, however, worked as interns without a salary.

The laboratory building itself had different sections and rooms. After entering the laboratory building, the staff members' offices were positioned to the right. To

the left, a bit further down the hall, two huge windows looked onto two separate laboratory rooms. One room was filled with centrifuges to extract plant material, scales, columns, an extraction hood to prevent toxic fumes, various liquids in brown and transparent bottles, and samples used in TLC (thin layer chromatography) and HPLC procedures. At the time of my arrival, the HPLC machine located in one laboratory room, was the key technological device used in the laboratory, though this would soon be topped by a newcomer, the LC-MS machine – which the IKS staff members almost gently referred to as "the Ferrari," since the machine was worth 7 million USD and, at that time, was one of only two in South Africa. The LC-MS was placed in the second room, which was still almost empty when I arrived. The two high-tech machines constituted the centers of research attention at the IKS Laboratory. All other scientific practices were preparatory before using one of them. The data extracted by the HPLC and LC-MS machines, in the form of small samples of plant extracts, was itself only pre-phase data, however, used (possibly) in the following pre-clinical and clinical trials, which were mostly outsourced to university laboratories or smaller biotechnological companies. The IKS Laboratory was therefore equipped mostly for basic biochemical research.

Behind the two front laboratory rooms, four extra rooms were equipped with further technical devices. In the first room stood a huge machine for labeling tea bags and another machine producing PHELA labels[6]. The second room was equipped with an extraction hub and a medicinal syrup production area. The third room contained a huge plant grinding machine and a plant-drying oven, and in the last room stood a massive deep freezer to flash freezes medicinal plant material. All of the equipment was impressively shiny and their labels designated them as imported from China and India. Most of the expensive machinery, however, remained untouched over the course of the year. Occasionally, when visiting researchers or other visitors – such as a delegation from the Department of Science and Technology or businessmen from China – came to the laboratory, the shiny machinery would be presented, and sporadically used.

The researchers themselves often addressed the aspect of motionlessness at the laboratory and referred to the fact that "nothing changes." In informal conversations, I gathered that many of the researchers and other staff members were quite discontent with the work at the laboratory and their feeling of dependency on the sole person in charge, the director, who was, however, rarely present. One of the senior researchers stated ironically with regard to the few changes that occurred: "The more changes are going on, the fewer changes." The changes to which he was referring were the implementation of the LC-MS machine, the extension of the office building to accommodate more staff members (who nevertheless had not actually

6 PHELA was the name of one plant mixture under investigation at the laboratory at the time.

shown up), and the creation of a medicinal plantation site behind the laboratory building to grow the plants that made up the PHELA mixture.

Although all of the technical devices were presented to me early on, and I quickly got to know about their functions, at the beginning of my fieldwork I was often lost and sometimes felt as if I was not quite in the right place at the laboratory. Observing biochemical analysis is different to actually doing it. I was unfamiliar with the specialized language of biochemistry and I had no experience with laboratory practices beyond the common understandings I had acquired at school. Bruno Latour and Steve Woolgar write in book "Laboratory Life: The Construction of Scientific Facts" a section "An anthropologist visits the laboratory' (1986):

> When an anthropological observer enters the field, one of his most fundamental preconceptions is that he might be able to make sense of the observations and notes he records. This, after all, is one of the basic principles of scientific enquiry. No matter how confused or absurd the circumstances and activities of his or her tribe might appear, the ideal observer retains his faith that some kind of systematic, ordered account is attainable. For a total newcomer to the laboratory, we can imagine that his first encounter with his subjects would severely jeopardize such faith (Latour 1986: 43).

Latour continued that the whole series of questions and answers conducted at the beginning of research in a laboratory would be understood by the anthropologist using his/her common sense, followed by a series of nonsensical impressions, before the researcher could try for a "deeper" understanding (ibid.). In this sense, a social science researcher's arrival at the laboratory is not much different to his/her arrival in a local community. The language spoken in a laboratory is as confusing and as 'unintelligible' as the language spoken in a local community. It takes years of academic training to become an expert in biochemistry and it would be misleading and even arrogant to expect to achieve a full understanding of these complex processes in one year of intermittent participant observation. The following section depicts what I nevertheless learned of the trajectory of medicinal plants and associated knowledge from their place of origin to the biochemical laboratory of the IKS Lead Program.

From Indigenous Knowledge Systems to the IKS Laboratory: A Challenging Translation

A couple of weeks after my arrival at the IKS Laboratory, Dr. Matsabisa introduced me to the extensive research plan that he had formulated for me for the coming research year. The IKS Lead Program's network stretched far beyond mere scientific research, and thus the schedule outlined access that I would have to interview

partners such as traditional healers, politicians, lawyers working in the realm of indigenous knowledge systems, and medicinal plant plantation site managers. Although it was a cooperative and helpful gesture, the schedule also made me worried about my independence as a researcher. How much would I be obliged to conform to Dr. Matsabisa's plan and how would I ensure my independence in order to uphold a critical perspective? In the end, it transpired that only a limited amount of the schedule was put into practice. Dr. Matsabisa was away for most of the year on national and international business trips and barely spent time at the laboratory (his ongoing absence was noted among the disgruntlements of the IKS Laboratory's employees, as mentioned above). In contrast to my concern of being overly controlled, I was in fact left to my own devices much of the time, and oftentimes there were periods where nothing happened at all. Occasional invitations to meetings of political and/or scientific significance – such as a telephone conference on the amendment of the MRC intellectual property policy or trips to follow up medicinal plant claims – made up for the lack of supervision.

Medicinal plant claims are actually only one of the many ways in which a medicinal plant and its associated knowledge can enter the laboratory, alongside the rescreening of already existing libraries and databases for new chemical compilations, or the analysis of randomly collected plant material. Yet such claims provide a higher chance of detecting new compounds, methods or therapeutic uses, and are the most promising way in which to discover new drug leads from medicinal plants. Medicinal plant claims are the beginning of the trajectory of medicinal plants and indigenous knowledge into the IKS Laboratory.

Below, I cite an excerpt from an interview that I (BR) conducted in March 2009 with Mirranda Javu (MJ), an IKS Lead Program research assistant and assistant to the IKS Lead Program director and my translator from isiXhosa into English, and Ntate Ndeni (NN), a traditional healer from the Eastern Cape. The excerpt illustrates the ambiguous transition of medicinal plants and indigenous knowledge from the realm of traditional healing to the realm of biochemical research in a laboratory. It is ambiguous due to the meeting of two different systems of knowledge, meaning and value, with vastly differing ontologies and epistomologies, meaning that sometimes the two sides cannot find a way talk to and understand one another:

> *MJ:* The Medical Research Council has a unit called IKS [Lead Program]. It focuses on traditional medicine. Even if you are not a traditional healer, even if you are not a herbalist, if you know about herbs, you are welcome to deliver your information on, let's say, a medicine against cancer. Then you will be involved in a process, so first they give you an agreement; if you agree, you understand; and if you understand, you let us know: 'I am ready to disclose this and that information based on this evidence'. They give you money, and the IKS makes pre-clinical trials and capsules.

BR: And do you think this is a useful approach?

NN: To me it makes sense, although I never claimed a medicine. There are people who don't want to be seen using our [traditional] medicine. Eh, maybe one would love to have capsules or tablets, because other people don't want to be embarrassed. Uh, they think we are bewitching them. You see, so people will feel free to take capsules or tablets. There are people, even those people in the parliament, doctors, lawyers, they come to us, but other people, they don't want to be seen using our medication as it is. Now they will feel good. I remember, we went to parliament for an exhibition, so, no embarrassment from now on. You'll be using your traditional medicine freely, no embarrassment.

BR: But then [traditional] medicine does not have anything to do with the work of the healer anymore.

MJ: OK, if Ntate Ndeni is giving out medicine or his plants to IKS, definitively he will not just give his plants; there is something he has to do.

BR: What is it he has to do?

MJ: Something. He cannot just give his plants to IKS, because he has got ancestors.

NN: I have got ancestors. I cannot just do it freely as I want or wish to. Because that medicine is not mine, it's from my ancestors. So I have to ask permission from them first. Pray to them.

MJ: Otherwise they won't show you the plants. You go there and don't see it. The plant is there. You go there and see it, I go there and don't see it.

NN: Because they [the ancestors] say: 'You do as you like with what we have given you. But not without our permission.' If they don't want, they don't want.

BR: But (…) let's say there is a sangoma, he knows a mixture of certain plants and he realized for himself that it works, because 20 patients already got healed with it and he is not listening to the ancestors (…) and he is ignoring what the ancestors say and will in any case go to IKS. Do you think he will be punished later?

NN: Ju, very bad. Very bad. Not supposed to do the thing. He even can be killed. You have to do certain rituals. It is not easy. You have to be correct with the ancestors.

The transition of knowledge from the realm of traditional healing to the laboratory is, according to Ntate Ndeni, impossible without ancestral guidance and consent. In the previous chapter, I described the strong relationship between medicinal plants, traditional healers, the ancestors, patients, the community and the environment. Hardly any transaction of knowledge in the realm of traditional healing is supposed to be practiced without the (ritual) inclusion of the ancestors. The disclosure of knowledge to a scientific institution also requires ancestral consent. This is a moral and ethical obligation. As Mirranda Javu, a staff member at the IKS Lead

Program and a trained healer, told me: "Well, you first have to consult the ancestors. When they agree on the disclosure, then you can do it without problems. When you don't ask them, they can get very upset and they might even harm you" (Informal conversation, Delft, February 2009).

Once knowledge is disclosed to a scientific institution like the IKS Lead Program, or any other research institution[7], the future of this particular knowledge is unpredictable. It might terminate in a dead-end without yielding further results, or it might enter the global market in the form of a new chemical compound and/or pharmaceutical product. The main objective of the IKS Lead Program Laboratory is the biochemical analysis and transformation of traditional medicinal plants into medically viable and economically valuable research results for the treatment of the core diseases of HIV/AIDS, TB, malaria, hypertension, cancer and diabetes. In addition, medicinal plants are used for poverty alleviation, socio-economic development and job creation, for instance through the development of plantation sites for the breeding of medicinal plants. The IKS webpage presented its mission as follows:

> The IKS mission is to promote and advance indigenous knowledge systems through research, research and development by making it a valued health model in the global environment and to redress health traditions, which until now have neglected health priorities and issues[8].

It might seem curious that the IKS Lead Program, in its stated mission, proposed the advancement of indigenous knowledge systems, while the IKS Laboratory itself was mainly interested in the analysis of medicinal plant mixtures, irrespective of the origin of the knowledge. The fact that the medicine and associated knowledge of traditional healers often contained a viable traditional medicinal product already – i.e. a product that had been used as a medicinal cure over the course of generations by local traditional healers – is beside the point of the mission statement, since the IKS Laboratory was only interested in traditional healers' knowledge if it contributed to the impending biochemical analysis and the development of a pharmaceutical product.

7 The IKS is only one of many scientific laboratories in South Africa that at this point in time analyze medicinal plants. The University of the Western Cape's TICIPS (The International Centre of Indigenous Phytotherapy Studies) Program, the South African Herbal Medicine Institute, the University of KwaZulu-Natal South African Research Chair in Indigenous Health Care Systems and the University of Pretoria Phytomedicine Program all also work with medicinal plants. In addition, biotechnology laboratories work in the commercial analysis of medicinal plants. University laboratories and Biotechnology Labboratories often cooperate.

8 http://www.mrc.ac.za/iks/indigenous.htm (this webpage expired after the MRC underwent a huge restructuring process in 2014).

But what does the advancement of indigenous knowledge systems – in the context of the IKS Lead Program's mission statement – mean? What entitles science to claim that it can make indigenous knowledge systems into a "valued health model," given that many already consider these systems valuable? These questions create an ambivalent picture of the relationship between the scientific knowledge system(s) used at the IKS Laboratory and the indigenous knowledge system(s) brought into the laboratory. The program's name ostensibly indicates an integrative approach, as it highlights the support, promotion and protection of indigenous knowledge systems. However, when looking at its mission statement, the IKS Lead Program instead seems to claim a hegemonic power to advance and improve indigenous knowledge in accordance with global standards by means of science and technology. Lesley Green asserts that "indigenous knowledge is tacit knowledge and therefore, not easily codifiable. It is dynamic and based on innovation, adaptation, and experimentation, thus codifying indigenous knowledge may lead to the loss of some of its properties" (Green 2008: 136). While indigenous knowledge may be valuable for tracing new products, the aspect of spiritual and socio-cultural background, or cultural and social capital (Bourdieu 1986) – in the form of integrating the ancestors into the transmission of knowledge to third parties, for instance – is left behind in the allegedly integrative approach of the IKS Lead Program.

Indigenous knowledge entails the entire cosmology of ancestral connection between plants, knowledge and people, which is neither transferred into the laboratory, nor can it be tested for efficacy. It is basically carved out at the doors of the laboratory. Consequently, the trajectory of medicinal plants and associated knowledge from their place of origin into the laboratory is paved with challenges, which is not only, but also, caused by misunderstandings or misinterpretations between the interacting representatives of the respective knowledge systems. The next sections deal with the challenges that emanate from the trajectory from indigenous knowledge systems into the IKS Laboratory and makes the transition from *muthi* to molecule not impossible but more unlikely. The first suspense occurs right at the beginning, when a knowledge holder decides to disclose knowledge of a plant or plant mixture to the IKS Lead Program.

First Challenge: How Muthi Does(n´t) Enter the Laboratory

New resources for scientific investigation can be found in abundance in the public domain. Medicinal plants are available at urban or rural markets, as weeds on the side of the road, or as knowledge on plants published in anthropological articles, all of which offer an array of investigative trails (Hayden 2004: 11). These publicly accessible sources and resources have one advantage; they are freely accessible. This changes, however, the moment that (indigenous) knowledge is involved, and when this knowledge enters the domain of commercialization. Generally, the

role of indigenous knowledge in new drug discovery cannot be underestimated. Of all prescription drugs derived from natural products (which constitutes around 25%), about 80% were discovered based on knowledge obtained from the use of traditional medicines and indigenous knowledge holders (Kate & Laird 1998; Laird 2002). Unsurprisingly, bioprospectors increase their chances of finding new leads from 1:10,000 to about 1:2 by consulting indigenous knowledge holders; this, at least, was claimed by Dr. Matsabisa during a presentation that he gave to visiting members of the Department of Science and Technology (DST) at the IKS Laboratory in October 2009. Whether this was a true figure or a 'wishful estimation' remains unclear, though the fact that indigenous knowledge holders do increase the likelihood of detecting valuable new drug leads is certain. Therefore, next to screening already existing libraries and databases for 'old' plants to analyze for 'new' healing properties, new plants or plant mixtures are tested for as yet undiscovered chemical compounds. Medicinal plant claims, i.e. claims that promise new healing properties in a plant or plant mixture, can be proposed to the IKS Lead Program by anyone – whether a citizen of South Africa or another African country as well as non-African citizens – but traditional healers and their extensive knowledge on plant-based medicine are, logically, the most significant target group.

In the exploration of new plant-based products and medicines, the IKS Lead Program aimed to establish a trustful, open and transparent working relationship with indigenous knowledge holders, so that they would consider voluntarily disclosing and submitting their medicine for further scientific investigation. As of 2010, the IKS Lead Program had received over 200 voluntary medicinal plant claims from traditional health practitioners and other indigenous and non-indigenous knowledge holders. The IKS Lead Program director and his team would then decide upon the potential of the submitted claim and whether it was worth following up. When decided positively, the journey would lead all over South Africa, to speak with the claimants and evaluate the scientific value of the claim. This value would thus also depend on the further information disclosed by the claimant.

Of the four medicinal plant claim follow-ups that I had the opportunity to join, only one claim came from traditional healers. Claims, in my experience, were actually proposed more often by people who had regular access to the internet or similar sources of information; traditional healers in rural areas, on the other hand, mostly got their information from the huge countrywide network of different healers' organizations. For the discovery of a new chemical compound, *muthi* has to go through all relevant biochemical analyses, as well as through safety and efficacy tests. Against this background, the imagined hopes and expectations linked to knowledge disclosure and to handing it over to the realm of scientific investigation (cf. Brown 2003) could not always be fulfilled. So how are the claims made at the IKS Lead Program linked to the hopes and expectations of the claimants? Below, I describe two claim follow-ups made in Beaufort West in December 2009,

starting with Mrs. Dihara and then moving to the Mdehle Inyanga Healers Association of South Africa, both of whom had very different aspirations for their claims. Describing these claims helps to demonstrate the (un-)likelihood of *muthi* finding its way into the laboratory.

Hope in 'Rohelia': A Plant Claim for HIV/AIDS

The journey brought the IKS Lead Program Director Dr. Matsabisa, Mirranda Javu and me to Beaufort West, a road town and trading center in the middle of the semi-desert Karoo, situated in the inner part of South Africa. December is one of the hottest months in South Africa, but Dr. Matsabisa's air conditioned Volvo left the heat outside. After five hours of driving, we arrived in Beaufort West, also known as the 'Capital of the Karoo'. The Karoo is one of the main biodiversity hotspots of South Africa, rich in potent and medicinally valuable succulents and thorny bushes (Pinhaar 2009). Thundering trucks passed by the town along the N1 on their way from Cape Town to Johannesburg and back. Cheap 'Fong Kong'[9] shops, a KFC, a Chicken Licken and a liquor shop, which was already well frequented in the early afternoon hours, dominated the scenery. The backstreets were filled with Dutch style houses and churches, a relic of the Boere trekkers and the Dutch Reform Church that settled in Beaufort West in 1818. Today, Beaufort West does not offer much work and the unemployment rate among the black and colored population is high. White people own Saxon Marino sheep breeding farms. The contrast between black, colored and white lives was most visible in terms of housing. White people live either in the city center around the churches or on huge farms outside of town, while the colored and black populations live in more dilapidated and bleak settlements and townships at the town's margins.

The first claimant we met was the Afrikaans speaking Mrs. Dihara, a 60-year-old white middle class woman. Mrs. Dihara had gotten to know about the claim making opportunity at the IKS Lead Program after she had searched the internet for an institution that might be interested in her plant mixture. On the webpage of the Department of Health she had found a link to the IKS Lead Program's call for claims and had contacted Mirranda for more information and an appointment to exchange information on the claim. When we arrived, Mrs. Dihara was expecting us. Excitedly, she hugged Mirranda and greeted us enthusiastically. Her house was filled with pictures of Jesus, holy crosses, crocheted couch and table covers, and most strikingly, two organs next to each other in the corner of the living room. After she served us sweet, artificial Mango syrup, she started telling her story. She had come to Beaufort West after her husband had died 17 years ago to help "the

9 Fong Kong refers to products made in China, but also has the connotation of being cheap, low-quality and counterfeit.

people in the name of the lord." With this ambition, she had developed a mixture made of aloe vera and other ingredients that she would not disclose, but which are available in the supermarket, she emphasized. "Rohelia," said the label on the bottle, which contained a yellow, viscous liquid, "medicine against HIV/AIDS, TB, Cancer and Anorexia." Due to official laws of the South African Medicinal Control Council (MCC), it is not allowed to claim healing properties without the official certification of the MCC.

Nevertheless, Mrs. Dihara had great hopes in the potential healing properties of *Rohelia*. She believed that through the invention of *Rohelia*, God had given her a wonderful opportunity to help people with HIV/AIDS and at the same time make a bit of money. She had even made a record of the patients she had treated with *Rohelia* and had invited two of her patients to demonstrate the results. The two men reassured us that their wounds and shingles had gotten better and that their general health had improved as a result of the treatment with *Rohelia*. It was part of the requirements for claim making to make a record of patients' treatment histories. Although Mrs. Dihara had followed these instructions, I had the feeling that the longer we stayed in her house, discussing her claim and sipping the sweet mango juice, and the more the IKS director explained the procedures of making a successful medicine claim, the more quiet, almost disappointed she became. *No, she did not know that the IKS Lead Program does not automatically finance the scientific analysis of medicinal plants*. A funding agency or institution would have to be established, unless the claimant would want to pay out of their own pocket. "Where shall I get all the money from?" she asked timidly. "I am not a rich woman. You know, I am in debt, I even sold my car." "Well, if it is a strong and successful claim, we can find funding," replied Dr. Matsabisa, trying to cheer her up. But he knew already that this claim was a lost cause. The mixture contained no new chemical compounds. It probably contained Aloe vera, olive oil and lemon juice, well known and generally available ingredients. Mrs. Dihara's dream "to help people" and concurrently make a bit of money might not come true, at least not with *Rohelia*.

Hope in Helping People: A Plant Claim for Diabetes

Making traditional medicine available to the public to help suffering and sick people was another motivation for considering making a medicinal plant claim. This, at least, seemed to be the motivation of the other claimants whom we visited that same day. On the way back to Cape Town but still in Beaufort West, we turned off the main road and stopped at the Mdehle Inyanga Healers Association of South Africa. All previous claims visits that I had joined had been with 'non-indigenous'

people[10]. The three traditional healers of the association were the first claimants whom I encountered with an 'indigenous background'. The conversation between the healers and the IKS Lead Program team was held in *isiXosa,* with little time for translation into English. The following description is thus considerably shorter and only based on my observations and the short explanations of Dr. Matsabisa.

The three women who welcomed us at the small building of the Mdehle Inyanga Healers Association of South Africa were all dressed in *sangoma* attire, with the *sangoma* cloth around their waists and beads around their necks and wrists. The room we entered was slightly damp and dark due to the lack of windows. It was sparsely furnished, with only two chairs, one sofa, a table and a cupboard. The smell of *imphepho* drifted in from the neighboring room. A huge five-liter bottle containing a green transparent liquid stood on the low table. The spokesperson for the three healers explained that their claim was a plant mixture against diabetes consisting of the extraction of five different medicinal plants collected in the Karoo. But they did not wish to enter into an ABS agreement if the claim transpired to be successful. They did not know who in the association the original holder of the knowledge was. They only wished to make their medicine available to the public for the benefit of sick people. They had learned about the opportunity to scientifically analyze traditional medicines through the huge healers network that the IKS Lead Program had established.

Dr. Matsabisa first briefly introduced the three healers to the biomedical profile of diabetes. They listened attentively and added their knowledge about diabetes and why they thought their mixture was effective against it. As in all claims, the healers would not disclose their knowledge on any of the ingredients and the IKS Lead Program would never ask for it. The only information that Dr. Matsabisa asked for was regarding the purpose of the claim, the diseases treated with the claim, and the history and success of treatment, usually documented in patient records. The healers, however, could only offer undocumented information on their claim. Later, they also showed us a small bottle that contained a transparent liquid and a white fleshy worm. "*Nyoka* medicine," one of the healers said, "medicine against pollution in the body" (cf. Green 1994, Green et al. 1994). The healers did not consider proposing the *nyoka* medicine for scientific analysis, however. Perhaps they were

10 The other two claims follow-ups that I joined, but do not have the space to describe extensively here, had been made by the Tim Jan company and by a private colored man. Tim Jan is a mix of port wine and aloe ferox, which helps against constipation. The company also claimed that Tim Jan has antimalarial properties. They said that it had been tested on tourists in malaria infested countries. The tourists had used Tim Jan as an antimalarial, taking a tablespoon of it every day. Allegedly, none of the tourists had contracted malaria. The second claimant, a colored man in his 40s, offered an ointment consisting of eight essential oils. He had gotten the recipe from an old man and had developed it further, with the help of information he had found on the internet.

too aware of the limits of science, which would only be able to detect chemical compounds and not the power of spiritual healing.

All in all, this meeting was very different to the previous meeting, as at no point was there any intention for or expectation of an ABS agreement. Additionally, of the claims that I attended, it was actually the only one that contained potentially unknown medicinal plants, and it was the only claim that Dr. Matsabisa was fully interested in. He took the huge five-liter bottle back to the laboratory. Also because he was diabetic himself, as he told me on the way back to Cape Town, he was curious about the biochemical value of the green liquid. This claim, at least, seemed to offer some hope for a future product.

Hope and Reality in Claim Making

The examples of Mrs. Dihara's claim described above, and of the plant exchange in Thulamahashe described in chapter I, show how in many cases, the likelihood for plants to end up in the biochemical laboratory is quite slim. Even the future of the more promising claim of the Mdehle Inyanga Healers Association was, at the moment of knowledge disclosure, unpredictable. It could release unexpected findings and transform into a viable diabetes (or any other) product one day, or it could be just another of the many claims that lead to a dead-end. And yet, something had motivated Mrs. Dihara and 2000 other people to disclose their knowledge to the IKS Lead Program as of 2010. The fact that plant analysis is a long and cost intensive process was not known and not taken into account by the enthusiastic claimants. The quest of the healers in Beaufort West to make their knowledge and plant material available to the public seemed an honorable motivation. Even Mrs. Dihara's quest, driven by the hope of supporting sick people as well as benefiting economically from *Rohelia*, was understandable. However, both altruistic and idealistic motivations on the one hand, and economically driven hopes on the other, may finally turn into an illusion. It would not be the first time in the field of bioprospecting for an enthusiastic hope to come to a dead-end (cf. Rutert 2010). Nevertheless, despite these challenges, sometimes a new compound will be discovered or a new cosmetic adjuvant developed.

The unpredictability of a claim and the expectation of an emerging biovalue produced through the biotechnological intervention and manipulation of plant material creates hopes and a "dynamic of expectations" (Brown 2003: 3) in knowledge disclosers and scientists alike. To some degree, it is the "intense future orientation that is essential to the rehearsal of the many possible prospective presents embedded in biotechnological research and discourse" (ibid.: 4). The hope when disclosing knowledge is to make an investment in a better future, for oneself and for others. Mrs. Dihara hoped to help people with HIV/AIDS, and to help herself with some additional income. The healers of the Mdehle Inyanga Association hoped to help

people overcome diabetes. This future orientation has its basis, amongst others, in a knowledge economy, in which "expectations are loaded with value, they are tradable and therefore form the basis of exchange relationships with 'communities of promises'" (ibid.: 5). In the interaction between the knowledge disclosers and the IKS Lead Program staff members, the exchange of information is an investment into the future, an oscillation between present problems and future solutions. Future solutions, at least for the larger public, can only be provided by science and biotechnology. Carlos Novas described this as the "political economy of hope" (Novas 2006: 290):

> The scientific discoveries and technologies breakthroughs associated with the new genetics have created the potential and hope that cure or treatments for many human ailments will be found in the near future (…) the hope invested in science is not only an aspiration, but can also be thought of as having a political and economic materiality that seeks to bring to fruition the many future possibilities inherent in the science of the present (ibid.: 289).

The investment of the knowledge disclosers is the giving away of individually held (in Mrs. Dihara's case) or collectively held (in the healers' case) knowledge for the health benefit of the public. The Mdehle Inyanga Association healers gave their knowledge away without any expectations of personal benefit. They gave it as a 'pure gift' (Nakozora 2015), giving without taking, as the benefits were unpredictable and not even wished for. This is not a general stance of all healers who disclose knowledge. The plant exchange in Thulamahashe shows that some traditional healers are interested in benefits, as well as in political leverage arising from ABS agreements and intellectual property rights. The 'pure gift', then, transforms into an object of commercial and political value. The green diabetes *muthi* remains, as long as it is not a marketable product, a non-commercial entity; this counts for Mrs. Dihara's claim and for the exchanged plant material of the Kukula Healers as well. But they may become commercial products at some stage in their trajectory. Medicinal plants and knowledge are thus neither pure gifts nor pure commercial objects. They are caught between the two poles of the hope to help people and the hope to benefit economically, and thus wander *in* and *out* of the economic market and gain "value through conversions from non-capitalist transactions" (Tsing 2013, 2015).

In the end, due to the unpredictability of biotechnological research, most of the hopes and expectations placed in medicinal plants and knowledge remain unfulfilled. As the above descriptions of voluntary knowledge disclosure reveal, such actions and encounters are guided by tension and challenge In the next section, I will show how these expectations and hopes are further challenged by the doubts and ambivalent positions of both traditional healers as well as scientists.

Second Challenge: "Why Does Science not Believe in Our Knowledge"?

The disregard for the cultural and social capital (Bourdieu 1986) of indigenous knowledge, once that knowledge enters the biochemical laboratory, was summarized pointedly by one of the leading South African politicians and scientists in the field of traditional healing and medicine, Dr. Isaac Mayeng, director of the Traditional Medicine Group at the Department of Health in Pretoria, South Africa". During a brief conversation in the little office room at the IKS Laboratory, he elaborately addressed the conflicts that come with knowledge disclosure to the IKS Lead Program:

> Look, traditional healing is holistic in nature due to the existence and context that is provided by a cycle of healing. The circle brings about balance in environmental, physiological, mental, social and spiritual well being to attain a state of heath. It is influenced by factors such as history, personal attitudes, belief systems, philosophy and social systems. The core elements of this healing cycle are the stages of life and beyond, like pre-courting and courting, conception and pregnancy, labor, disease, cultural situations, sanitation, dream management, death and post-death. A traditional healer would figure out which stage the patient is in during a counseling session and apply muthi according to need. The Western scientific system, however, is only concentrating on a very small cutout of this circle. Science is actually only interested in the disease part; all other social factors are not interesting for science. Nevertheless, I do believe that there are strong links between Western science and traditional knowledge. And, I think, anthropologists can depict these links[11] (from fieldnotes, August 2009; see also Mayeng 2009).

I met Dr. Mayeng, a scientist who had trained as a Western doctor and pharmacologist at the University of Cape Town and New York State University, during National Science Week at the IKS Laboratory in August 2009. During his youth and educational years, he had little exposure to African traditional healing. But to his own surprise, he had the calling as a healer in 1978, when he had just turned thirty. Later, he worked for the first South African traditional medicine database (TRAMED) at the University of Cape Town before finally being appointed director of the Traditional Medicine Group at the Department of Health (see Campbell 1998).

His triple role as a healer, politician and scientist was well recognized, but not always well regarded, by his fellow healers. A healer whom I met independently of

11 Dr. Mayeng gave a presentation at the 'Contested Ecologies Seminar Series' at the University of Cape Town in October 2009, where he extended these ideas (Mayeng 2009).

the IKS Lead Program at a gathering of healers in Oude Moulen[12], Cape Town, said about Dr. Mayeng: "This Mayeng is working on both sides, he is working for science and then at the same time he jumps to the healers' side. He is not trustworthy." And, he added, when I asked him about his views on cooperation between the IKS Lead Program and healers: "Well, the MRC takes all names and the use of plants for their pharmacopoeia without giving us something back" (Informal conversation, Oude Moulen, Cape Town, August 2009). This healer referred to fundamental problems in the transfer of plant materials and associated knowledge from the realm of traditional medicine to the biochemical laboratory, in particular (lack of) trust, imbalanced reciprocity and the reduction (or transformation) of values.

Dr. Mayeng was very aware of the suspicions aroused against him. As revealed in the quote above, he was also very cognizant of the friction and challenges between 'science' and 'traditional healing', two realms that seem far removed from one another, but are nonetheless closely interlinked in post-Apartheid South African research institutions like the IKS Lead Program. Although both realms fight to maintain their own ground, they nevertheless seem to be attracted and attached to each other. An obvious difference, however, is that "they [biochemists] have a laboratory" (Latour & Wolgar 1986: 257), which reinforces the existing power imbalance between the two systems in terms of technical superiority. Unfortunately, I did not have the chance to ask Dr. Mayeng to elaborate more on the links between traditional medicine and Western science, though the idea never left me, and indeed it has followed me throughout my research, thinking and writing processes.

The following conversation with a traditional healer, John Nxumalo, also took place during the 2009 National Science Week in the small herb garden next to the IKS Laboratory. John was taking a cigarette break from teaching young pupils from nearby townships about traditional healing and medicinal plants. His almost furious statement underpinned the tension between science and traditional healing:

> Tell me, why does science not believe in our knowledge? Why do we have to prove something that has been proven over so many years? If I want to get a patent on a medicine or plant that really works, how can I prove it without science? I was working with a plant that helped children with stomach problems, and it always worked. I worked with patients since 1980 and none of my patients ever complained or came back to me because he or she did not get healed. They all got healed. And now, suddenly, everybody is interested in us. If I give my knowledge away, someone will take the knowledge and use it for [his or her] own purposes. (…) Our knowledge came from our ancestors. If I want to make a patent, how can

12 The meeting assembled Xhosa traditional healers who were discussing the possibility of claiming Oude Moulen as land that belongs "to them." Oude Moulen is a large piece of land in the southern suburbs of Cape Town. Such land claims are not uncommon in post-Apartheid South Africa, but due to their complexity they cannot be discussed in detail in this thesis.

> I, as an individual person, claim a patent on knowledge that belongs to many of us, that belongs to our ancestors? (Informal conversation, August 6, 2009)

John displayed his annoyance quite frankly to me as a stranger, and was not shy in making his almost provocative statements about science. Maybe his annoyance had been brewing inside of him and other fellow healers for a long time and had never really found a voice beyond the circle of healers? Maybe it was not real anger but simply a summary of thoughts that many healers had about the interaction between science and traditional healing? He did, nevertheless, in the rather exposed, semi-open space of the herb garden, definitively summarize some of the main problems in the field of bioprospecting, namely the contradictions, challenges and frictions between indigenous peoples and their rights versus the hegemonic power of scientific, political and legal systems, with the sentence: "Why do we have to prove something that has been proven over so many years?" This supports the argument that traditional medicine becomes one element of what Laguerre (1987) has called "rejected knowledge": "[t]he status of rejected knowledge relies more on questions of power than on standards of truth and effectiveness" (ibid.: 11). The knowledge of traditional healers is not rejected due to its lack of effectiveness, but because of the power imposed by biotechnological intervention and scientific truth claims.

The protests and resistance of the healers against this fact-oriented system shows that scientific facts are mingled with values that are beyond science and state interests, and the mutual co-production of bioscience and politics (Jasanoff 2004). With regard to the inclusion of traditional healers in the bio-scientific analysis of medicinal plants, this poses fundamental questions of ethical justice. What role do citizens, here primarily traditional healers, play in a context where "science does not believe in our knowledge" and where the director of the IKS Lead Program claimed straightforwardly that "I am not interested in the spirit, I am only interested in the molecule" (from personal communication, IKS Lead Program, March 2009)? Such a statement leads to the impression that the IKS Lead Program basically does what Cori Hayden, in the Latourian tradition, formulated as "speaking for" (Hayden 2007: 732; Latour 1993). That is, "authoritative science both represents or 'depicts' nature and represents, or speaks for, the dense webs of interests of those people and things that have been gathered-to, enrolled, or 'interested' in the fact in question" (Latour 1993: 27, cited in Hayden 2007). In this regard, the IKS Lead Program basically aims to *speak for* indigenous knowledge systems and its representatives. And yet cooperation and integration are an officially proclaimed and practically applied part of the IKS Lead Program's agenda.

Marilyn Strathern (2000: 292–294) pointed to the challenge of including people in bio-scientific processes (such as clinical trials or the Human Genome Project; cf. Petryna 2009) in terms of differentiating between "'including people' and 'includ-

ing them *well*' (that is, ensuring that their participation does not become a form of exploitation or mistreatment)" (cited in Hayden 2007: 733). This implies that scientific knowledge should also represent the 'social interests' of the people and institutions who become wrapped up in its production (Latour 1993), which makes science a political matter (Latour 2004). The partial inclusion of citizens in the bio-scientific process speaks for what Rabinow (1996) has called "biosociality" or what Rose and Novas (2008) have defined as "biological citizens" (see also Petryna 2003), which entails not only the enclosure of citizens within bio-scientific processes, i.e. clinical trials, but also the question of on what basis these people and their claims shall be attached to the inputs and outputs of the research (see Hayden 2007: 736)

Consequently, the question is whether the IKS Lead Program, with its mission to advance indigenous knowledge systems, includes people well enough (Strathern 2000)? The statements of the healers above would suggest that inclusion does occur, but perhaps not well enough, for it basically ignores the social and cultural context of the knowledge and knowledge holders.

The next section looks at the third challenge that disrupts a straight trajectory from indigenous knowledge systems to the IKS Laboratory and a newly discovered chemical compound. This third challenge is about the scientific process and those who execute this process – i.e. the biochemists or pharmacologists – who, at the IKS Laboratory have distinct positions regarding their work and the items that they work with, namely medicinal plants and associated knowledge.

Third Challenge: "We Go beyond Their Knowledge"

Biochemical or pharmacological scientists work with a different set of knowledge than traditional healers. The scientists at the laboratory, mostly educated in South African, and sometimes European or North American universities, apply the scientific knowledge system(s) that they learned at university. Susan Leigh Star and Griesemer (1989) and other scholars such as Latour (1986), Collins (1983), Rouse (1986) and Hacking (2000) have shown that the kind of knowledge system we call 'Western science' depends on a variety of social, technical and literary devices and strategies, assemblages that move and engage local knowledge (Turnbull 2000: 20). Susan Leigh Star has suggested that we look at scientific theory and practices as

> deeply heterogeneous: different viewpoints are constantly being adduced and reconciled (…) Each actor, site, or node of a scientific community has a viewpoint, a partial truth consisting of local beliefs, local practices, local constants, and resources, none of which are fully verifiable across all sites. The aggregation of all viewpoints is the source of the robustness of science (Star 1989: 46).

The theories and practices used in biochemical analysis at a laboratory may seem neutral in terms of the application of specific techniques, materials and a robust

academic canon of knowledge. However, the interaction of these 'neutral' aspects with the analyzed plant material and (some) information from the indigenous knowledge system from which it originates (both of which are reduced to a specific extract), as well as the technical devices used and the opinions and knowledge(s) expressed by the scientists, are not always as 'rational' as may be expected in an 'objective laboratory'. Scientific analysis is highly technical, but it is simultaneously deeply intuitive and coincidental work. Michael S. Fischer provocatively proposed that when

> we watch carefully (…) we can see Alice in Wonderland and other worlds beyond the residues (the numbers, models, laws, arguments) by which we claim to understand what science is. These other worlds are lively: full of quirks and rituals, superstitions and fetishization, all-too-human transferences, competitions, and collaborations, all collaborations, mentoring styles and politichicking games, translations and shifts in scale, and financial incentives and other surprises (Fischer 2012: 386).

When taking into account these all too human aspects in the assemblage of what is represented in the laboratory, it soon becomes clear how and why science can be regarded more as a local knowledge system than a universal benchmark against which all other knowledge systems should be compared (Turnbull 2003). The dichotomy between scientific and indigenous knowledge is less of a rational construct and more of a multilayered discourse of creating scientific facts, decision-making, personal opinions and beliefs, dreams, intuition and educational background. As Knorr-Cetina (2001) has stated:

> How does a scientist decide to make a particular technical decision? By translating a choice into other choices. The point about translation is that they often implicate non-epistemic arguments and show how scientists continually crisscross the border between considerations that are in their view scientific and nonscientific (Knorr-Cetina 2001: 154).

A conversation between two scientists working with the LC-MS machine at the IKS Laboratory that I observed in October 2009 quite explicitly reveals the crisscrossing of scientific work with traditional medicine. At first, the conversation was about "deep science." One of the two researchers, James Mukinda (JM), said that he did not trust traditional medicine and believed that his job as a scientist was to prove the safety of medicinal plants. His colleague, Jaco van Zyl (JZ), agreed. When I went on to ask what they personally thought about traditional healing methods, they became almost agitated:

> *JM:* Oh, that is when you cut [the surface of the skin] and put medicine into the cuts, to become as strong as the medicine. Then you open your body to the evil

forces that can then work in your body. You sacrifice your blood to the demons. I can't believe in it. The movie Harry Potter is true. It is reality. It is the evil spirit that can lift you up. In witchcraft, the body can control the spirit. The ancestors are the evil spirits. It is pagan praying. A pagan is an evildoer. Their soul will go in trouble [JZ nodded approvingly]. A tattoo is a mark of Satan.

JZ: First, everybody should listen to the word of Christ. If you don't believe in Christ, then there is no belief.

The conversation continued onto illuminati conspiracy theories and the idea that Satan controls the United Nations. War making is necessary to sacrifice blood to Satan, hence there will always be war in the world, because Satan wants to rule the world.

The turn in the conversation was obscure. I had expected a rejection of traditional healing practices. Most of the scientists whom I interviewed said that they personally never visited traditional healers. But this fierce, almost enraged expression of denial of the practices of healers, by bringing witchcraft together with conspiracy theory, seemed farfetched. The supposedly 'rational' act of extracting compounds was mingled with religious beliefs. The two researchers were practicing Christians and regular churchgoers. In a side conversation, James would later elucidate that his life was basically divided between the laboratory, his bed at home and church. He said that he often dreamed about new directions to take, or about the next solvents or plant combinations he should try. The approach he took to science was thus an interesting mixture of intuition (dreams), ritual (the daily, repetitive structure of his day, combining religion – going to church – and science – performing scientific processes), personal beliefs and scientific work. A couple of months later, in February 2010, I had the chance to interview James Mukinda individually at the IKS Laboratory, and to return to his opinions and perspectives. He elaborated on his thoughts on traditional healing:

BR: Do you think witchcraft does exist?

JM: When you are Christian, a true believer, the sangoma can't have power over you, can't reach your spirit. It does not have the power to control you. But when you are not a Christian, these guys can play around with your spirit, can play around with your life. He can cast on you what you can call black demon, spirit, to disturb your life. (…) Because when people are not Christians, they don't have a strong faith, they believe in anything that comes. Some of the guys are just lying, they want to cheat [people out of] money, they scare you. (…)

BR: And what do you think about a healer who is a sangoma and Christian?

JM: It can't be. Because when you are a Christian, you cannot be a sangoma. You are pretending. Because as a Christian we have Commandments, and Jesus or God cannot allow doing that. You do contrary to what the Bible says. (…) You see, the knowledge of old people, I believe in that, I accept it, because this was passed

> on from generation to generation. So it was a fruit of trial and error. They have done well, but that was done in human beings. So now, today, we are trying to take it at that level and to scientifically prove it, to have proof of that knowledge, because that knowledge is still a theory, without any scientific proof. We take that knowledge as just speculation, and then we try to prove it. If it is provable, then we accept it. (…). One of the plants has been used for many years. But that plant is toxic, it is affecting the kidneys, it is affecting the liver, it is destroying them, but the people, because [of] what we call chronic toxicity, it's not acute, it is something that comes back if you take the plant regularly, then after 3 to 6 months, then the symptoms are back[13]. People say I am used to the plant. But they don't know that bit by bit it is destroying their bodies, but by now [that they are sick from the medicine] they are looking for a scapegoat.

James maintained his 'anti-*sangoma*' and 'pro-Christianity' position. Being a Christian and a traditional healer simultaneously was, according to him, impossible. In addition, it was clear for James that scientific work is necessary to prove the efficacy of medicinal plants, that an upgrading of scientific methods to ensure the safety of the medicine is necessary, even though he admitted that the knowledge of "the old people" does have some value. "The old people," according to James, does not necessarily refer to "the ancestors" but to the older generation, a strong reference point in African traditions. Cases of intoxication induced by medicinal plants are not rare (i.e. Steenkamp 2002, Steward 1996). The fact that intoxication and incorrect dosage also occur in biomedical treatment did not seem to play a role in James' personal argument. He represented the idea of a hierarchical imbalance between the knowledge of traditional healers and science, with the latter being the one that could 'upgrade' the first. His argumentation moved in and out of personal, subjective interpretations and rational, medically based reasoning about the efficacy and value of medicinal plants. His argument can neither be called purely scientific nor purely non-scientific.

It must be pointed out that James cannot be taken as representative of all of the researchers at the IKS Laboratory. First of all, he was not directly employed at the IKS Laboratory but was a visiting researcher tasked with conducting research using the LC-MS machine. Second, he was the only non-South Africa (he was from Kongo), whom I interviewed. Third, his religious views were almost radical, particularly when compared with many of the other researchers, who had much more balanced views regarding their work and interactions with traditional healers, their

13 James was referring, among others, to the then recent example of the plant mixture Ubhejane, which it was claimed could cure HIV/AIDS. A truck driver named Zeblon Gwala was the original 'inventor' of Ubhejane; he alleged that he had dreamed about the mixture. The case led to heated debate, since the 'remedy', rather than curing HIV, in fact caused liver failure among those who took it (Levine 2012: 56 ff.).

knowledge and medicinal plants. Brian Sehume (BS), for instance, a Master student whom I interviewed at the IKS Laboratory in January 2010, expressed an almost diametrically opposed opinion to James:

BR: Do you believe in the medicinal power of medicinal plants?

BS: Yes, I believe they work.

BR: And do you believe that they have the solution for, let's say tuberculosis?

BS: Yes, I do believe that. It's just the reason why I can't find something on the market. I am following Western procedures of isolating [chemical compounds]. Those procedures are not really the right procedures, because we need new protocols on medicinal plants than those protocols that are dictated to us by Western society.

BR: And what could be the alternative?

BS: The alternative? We must do research in our own way. In South Africa, if I want to do research on traditional medicine my own way, there is no way that any university teaches it. We are trying to mix, but then we lose it somehow.

BR: But what is an alternative way? How does it look like?

BS: Well, look, plants have always been used by our forefathers or whatever, and the problem now with medicines, even the antibiotics that are on the market, is the dosage, and that is why in most cases you develop a resistance. My personal belief towards this is: the old people used to know the dosages, the medicines and how to prepare them. And we don't know that [anymore]. You know, even the machines in the back, I actually felt bad when those people [plantation site workers from De Doorns] were here and the machines, I just wanted them to be quiet. One of them even said: "But you are changing something in the plant." And it is true, we are changing something in the plant. But this is the scientific way of doing it. But we shouldn't even be doing stuff in test tubes to test these medicines. I think these things [medicinal plants] are meant for human beings and should be tested in human beings. The thing is you then start testing toxicity. You prepare the medicine and give it to people and see if there is any toxic effect, and if there is nothing and then you go on and check the efficacy of this (…) Then the same way it was prepared, that's how you should have [traditional] medicine on the market.

Brian claimed that African traditional medicine calls for new protocols that should support research conducted "in our own way," namely an African/traditional way. The scientific methods used at the laboratory were based on standardized (Western) academic practices and knowledge. These practices and knowledge manipulate the medicinal plant to detect a viable compound. An 'African way' would rely more on the methods and knowledge of the "old people," on the knowledge and trial and error experiments that exist already. "The same way it was prepared, that's how you should have the medicine on the market," claimed Brian. Despite these idealistic

notions, he nevertheless followed the common methods of biochemical research for his Master studies, knowing that he had no other choice; he saw the manipulation of medicinal plants for the purpose of research and product discovery as inevitable. He might also have known that research and development is driven by failures of the industry to seek alternative methods and approaches such as combinational chemistry or the better study of already existing natural products (see Koehn & Cater 2005; Handelsman 2005; Wynberg & Laird 2009). Despite this, he did what his research project expected him to do. An adjusted African model of research would probably take years to establish in African laboratories, if at all.

Nchinya Benedict Bapela (Benni), a post-doctoral researcher at the IKS Laboratory, had yet another different stance with regard to traditional healers and traditional healing when I interviewed him at the IKS Laboratory in January 2010. I asked him whether he himself ever consulted *sangomas*. He replied:

> No, I don't. But I will be honest with you. I don't really want to know what my future will look like, my destiny is in my hands, I don't think it is in their hands, or whatever. And a second thing: I think their trend is more about trying to make you feel small or making you afraid in a way. If I have to go and say I am sick, so I have cancer, and they say ok let's take a look and they throw their bones and say, we can see your disease is cancer. And they will then prepare a medicine against cancer, and then it is good. But in most cases it is not like that. Why do you go there and you have to tell them you have cancer or they throw bones and they will tell you that you have cancer or they will tell you lots of stories and say people are bewitching you. But also I think they believe that they are in contact somehow with the people that are dead and they are getting messages from those people, and me as a scientist I cannot prove [this] and as a black person I cannot disapprove. Because there are people that are like that. You as a white wouldn't really understand, because they [dead people] don't even exist. (…) When I am sick, I am not going to a sangoma. If I am sick I rather go to a herbalist. I tell him, 'I have this problem, can you give me medicine?' The herbalist knows that for this disease you give this medicine and they tell you how to prepare it. I don't go there to be told about my ancestors. Well, I also don't believe in those people who read palms. Because first they tell you how good you are and how smart and they go on and then take your money. And you can't argue against their ancestors, saying no. So, there is still fear and then they start controlling you, play with your mind. So that is why I don't really like this kind of healers. One time we were traveling in the Eastern Cape with the IKS [Lead Program] and this man wanted to scare us. He is a big doctor who wants us to come into the room, we are sitting there waiting with Gilbert and he comes back with a long snakeskin. So he asked us, 'Do you know what this is?' and we said 'Ya, this is a snakeskin.' He said, 'Ya, I killed it myself.' So, I got so angry I just stood up and

> went outside and let Gilbert talk to him. And another one, my interest was always in TB, so I asked: 'Do you know what is TB?' and he said 'Ya, I know, it's germs that are in you.' So I asked, if he has a patient that has TB, what is he doing? [He replied] 'That person, you just give something to vomit and he will vomit these germs out.' But they do also good to other people. I mean, personally, first of all, I must say there are sangomas that are really gifted. They do not exploit people. But I think they [people visiting sangomas] are scared, and especially in urban areas you find a lot of crooks.

Benni's concern about traditional healers was about the potential manipulation that may occur during a consultation. He also referred almost angrily to the lack of knowledge that some healers had with regard to the most pertinent diseases in South Africa, namely tuberculosis and HIV/AIDS. Benni still believed that there are gifted traditional healers with great healing capacities, but at the same time he warned against the many crooks, particularly in urban areas, where the lack of social control enables the uncontrolled 'training' and practice of traditional healers. He therewith highlighted and confirmed one of the pertinent challenges in the realm of traditional healing, namely the lack of control over teaching methods, particularly with regard to the preparation of medicine and quality of *muthi*, a problem that the government has endeavored to address with the THP Act (2004).

Manipulation in the interaction between healers and scientists, in both directions, seemed to be a major concern of many of the scientists at the IKS Laboratory, though people expressed their concerns differently. Another post-doc researcher, Duduzile Mofele (DM), a female chemist in her 30s, seemed to have a more diplomatic view about traditional healers and their practices when I spoke to her at the IKS Laboratory in January 2010. She was passionate about her research area of medicinal plants, which probably made her particularly careful about not being too judgmental. She took a standpoint in defense of traditional healers, and even more so medicinal plants. She even claimed there to be commonalities between traditional healing and the natural sciences.

> *BR:* Do you personally believe in the power of muthi or in traditional medicine?
>
> *DM:* I believe in the plant, as a chemist. As a chemist, all the structures we eventually synthesize were all discovered from plants.
>
> *BR:* But [you do] not [believe] in the other part of the medicine, methods like cuttings?
>
> *DM:* Well, you know, hmm, not really. But people are diverse, people differ (…). But with the medicinal plants, it is something I can work with and I know what is happening in it. With this other one, cuttings, they perform their own rituals; I won't understand what is it exactly, but I respect them in that way and we work with them. You know, for me to be able to work with them, at least

one should try and listen and understand and not to judge. We once went to the African Traditional Medicine Colloquium, it was researchers and traditional healers, so they performed their ritual prayer, burned their incense, sang their songs and did all these things. So for me, although I don't believe in them, I have to respect.

BR: Ya, and you can learn from them and the other way round.

DM: Ya, but they don't like researchers much. Because they feel manipulated by them. Because I remember when we were there, they kept on saying, 'The researchers steal our knowledge'.

BR: And do you think working with them is useful?

DM: Ya, partly, because we need parts of their knowledge, hmm, information. Healers, they have a long [history of] traditional knowledge, created over generations, that is almost similar to what scientists know. I went to sangomas and they explained that they burn poisonous plants to reduce the poison and then they mix it with fat and so on. They have got trial and error methods over centuries. Got them to points where scientists ended up over years of research. I think there is a lot of interaction between these two worlds [science and tradition]. There is lot of common things. We can end up integrating the two. That's why I am focusing on the common things that we have.

Duduzile took a totally different position here than some of her colleagues. "I have to respect" their way of being different, she insisted. She even saw some commonalities between traditional healing and science, such as burning plants to remove their toxicity. Therefore she preferred to focus on finding new valuable medicines with the help of indigenous knowledge, since she knew that the knowledge and information of traditional healers is indispensable for the discovery of new products. She even acknowledged that healers have come to equivalent points in their knowledge development through trial and error as reached by scientists through their own research. And she admitted, conversely to what Benni said, that traditional healers also feel manipulated by scientists (and not only the other way around, that healers are the ones doing the manipulating). In general, she preferred to look at these communalities instead of building up extra boundaries. Adam Ashforth, in his book 'Witchcraft, Violence and Democracy in South Africa' (2005), cited a similar comment from a young high school student whom he interviewed:

> To my personal point of view, I think physical science, or physics, goes hand in hand with African physical sciences. Why am I saying this that physical science, well it is approved, and it is done by different nations, like Greeks, Americans. But it is in a modern way. There are labs, there are laboratories. With us, we don't have laboratories. It is done in an old way. But it goes hand in hand (Ashforth 2005: 146).

I have chosen to highlight these interview excerpts with IKS staff members (Brian, Benni and Duduzile and a visiting researcher (James)) to show how ambivalent the position of the scientists was towards indigenous knowledge system(s) and their representatives (see also Verran 2001). With the exception of James, the researchers did not have a clear-cut anti-traditional healing position. It seemed clear for them that indigenous knowledge systems are a vital and valuable contribution to the discovery of new medicines, enclosed in the plant material. Knowledge, in this sense, is a path towards the better use of the plant material. It seemed more that the aspect of the abuse of power and manipulation attributed to traditional healers was regarded as most threatening by the scientists; something that they might have experienced in their private lives, and not only or necessarily in their professional encounters with healers. This might be one reason why the researchers claimed that they did not seek advice from traditional healers for private purposes. But even their professional encounters were loaded with emotions (and not only positive ones), as Benni's almost angry account of "crooks" and their lack of knowledge on diseases revealed.

Obviously, the interaction between science and traditional healing is pushed forward by the efforts to find common ground. But at the same time, this interaction is loaded with misunderstandings and stereotypical judgments. In sum, the excerpts present the mainly subjective antagonism between acceptance and respect on the one hand and distance and neglect on the other. The researchers did, however, worry less about the value of their scientific knowledge and more about the validity of traditional healing knowledge. This complies somehow with the comment of the healer above, who seemed concerned about the implications of the cooperation between scientists and traditional healers and the lack of belief in indigenous knowledge. Although interaction between the two realms is sought for, it remains an ambivalently connoted cooperation.

Partial Connection and Mutual Dependency: One System Needs the Other

As was shown, scientific knowledge and practices, like all other knowledge systems, have particular local manifestations (Watson-Verran & Turnbull 1995). The knowledge and practices produced at the IKS Lead Program are the products of a certain moment in time and particular political, socio-cultural and economic (power) configurations. Other outside influences discursively co-produce and shape this scientific knowledge, like the traditional healers and their knowledge systems, politicians and politics, as well as pharmaceutical companies and the economic market. The IKS Lead Program, with its mission, staff members and equipment, represents a very particular form of scientific knowledge production and scientific facts; not as a solitary nucleus cut off from but rather formed in relation to other – specifi-

cally indigenous – knowledge systems. In both sides' attempts to collaborate, they ideally ought to *speak to each other*, instead of one system *speaking for* the other.

So far, the impression might have come up that traditional healers are basically "databases for potential identification of sources that may yield lead compounds with bioactive properties" (Ntutela et al. 2009: 34). This reduction of healers to mere "databases" obviously creates tension, but maybe also provides opportunities. The engagement of a healer with the IKS Lead Program represents new efforts in post-Apartheid South Africa to at least establish a form of communication between the two systems. At the IKS Lead Program, traditional healers have the chance to confidentially share indigenous knowledge on plant material, which, in case valuable chemical compounds are detected in the laboratory and transformed into a pharmaceutical product on the market, might be followed by an ABS agreement. This is a laborious process that, on the scientific side, is time and cost intensive with a low chance of discovering the needle – i.e. a new compound – in the haystack due to the endless combinations of possible compounds in a medicinal plant or medicinal plant mixture. The opportunity for healers is less about the product and more about the integrative dialog that may arise from this disclosure of information, a dialog that was previously completely impossible due to the repressive Apartheid politics in South Africa. The healer whom I spoke to in the IKS Laboratory's herb garden questioned this endeavor with the assertion that indigenous medicinal knowledge already heals effectively. Although the healer pronounced his discontent clearly, he was nevertheless still voluntarily cooperating with the IKS Lead Program as a teacher, as well as in terms of receiving the offered training opportunities (such as in tuberculosis prevention). He, like many others in the field of bioprospecting, represented the dialectic interplay between protecting and evaluating (indigenous) knowledge and medicinal plants, and the wish to get a piece of the cake (including educational and financial benefits). He questioned this situation, but also seemed, due to his attendance at the IKS Lead Program, to be intentionally interested in being part of it; a stance he shared with other healers who worked with or for the IKS Lead Program, or other similarly oriented research institutions.

Obviously, the two systems are based on differently enacted practices, concepts, methods, materials and actors. At the same time, the involved actors have the utilization of the material properties of medicinal plants and their effects on human health in common. There are "partial connections" (Strathern 2004) between the two systems, in which the one system cannot be enacted without the other. The IKS Lead Program would not exist without the indigenous knowledge systems of traditional healers. Medicinal plant screening and analysis is much more efficient when it includes the pre-existing knowledge of traditional healers. Traditional healing knowledge and its material, in turn, can only be made available to the market when it is disclosed to and 'advanced' by scientific practices and knowledge systems. The two knowledge systems co-exist in an interrelated mutual dependency,

but are nonetheless caught in a power discourse, with the scientific realm posing hegemonic claims over indigenous knowledge systems. Some healers accept this claim. Others, like the healer in the IKS Laboratory's garden, feel inadequately heard and represented. His claim called for a more thorough understanding of the cultural and social value of knowledge, instead of only looking at the economic and scientific value. But at the same time, he was also aware of the fact that economic value can only be made through scientific intervention.

Accordingly, the trajectory of medicinal plants and associated knowledge from *outside* to *inside* the laboratory is paved with ambivalence and juxtapositions. But what exactly, after all, really happens in the laboratory? What practices and knowledge are used to transform *muthi* into a new chemical compound? What eventually is the "deep science" that James spoke about?

"Deep Science": The Biochemical Transformation of Muthi

The previous sections showed that the path to the laboratory is a stony one full of ambivalent challenge Once a claimed medicine has nevertheless managed its way into the laboratory, a long and tedious process of research and development begins, which involves an assemblage of human and non-human actors. So what instruments, materials, knowledge, actors and practices are used to make traditional medicinal plants and associated knowledge viable and legitimized biochemical information?

Again, Duduzile Mofele (DM) explained in brief words the assemblage of scientific practices that a medicinal plant or plant mixture must traverse, the methods, practices and theories used, and the thing being searched for: the smallest unit of a medicinal plant, the chemical compound.

BR: What is your assignment at the laboratory?

DM: I am working as a chemist. We extract and analyze them [medicinal plant compounds], we are trying to analyze the chemical constituency, or the compounds that are found in that particular plant. By knowing them we know they are doing some bioactivity, and then we check if there is a compound that induces biological activity.

BR: What does biological activity mean?

DM: Microbiological activity, that is when they are doing these tests, or maybe during clinical trials when they are doing safety, toxicity and check other biological activity. For example, when you do the extracts and then they will test the extracts without purifying it first. And then, after purifying it again, I mean they test the extract of it that shows any activity. And then they will purify it further. And then test different fractions that have been collected and if there is one or

> two that shows interest you go further and do in-depth now to find out exactly what compounds are in that extract. So basically it is structural investigation.
>
> *BR:* That is what Jaco [Jaco van Zyl, employed at the IKS Laboratory as an LC-MS technical engineer] is doing?
>
> *DM:* Ya, that is what Jaco is testing. Because for structural elucidation you need to know the molecular weight of that particular compound. So basically, his instrument [the LC-MS machine] is determining that. So it is an essential part of the structural elucidation. We also need this information in order to say 'This is a pure compound' and 'This has this particular molecular mass'. So once you come up with a structure, you need to come up with the molecular weight and then you have to match it with the data, which comes from Jaco to say, 'Yes this is the one, no this is not the one'. (…)

Duduzile outlined a number of the actors, practices and parameters that were involved in the assemblage of human and non-human actors at the IKS Laboratory, namely the LC-MS machine, the process of structural investigation, the plant material and Jaco, the technical engineer. They were involved in processes called *particularization*, the identification and separation of useful knowledge (Agrawal 2002: 290) and *abstraction*, the identification and separation of useful material, to be tested and validated using criteria deemed appropriate by science (ibid.: 291). Abstraction discards spirituality, rituals, language, practices, sensations or interactions between healers and patients of indigenous medicine and replaces them with scientific rituals, language, practices, technologies, materials, sensations and intuition. The use of scientific criteria to test and examine in clinical and pre-clinical trials and the documentation of these tests can be called a *validation* process (ibid.) to ensure and secure "scientific facts" and "objective truths about efficacy", as Vincanne Adams claimed (Adams 292: 659). Waldram (2000) has reasoned that the clinical trial (and I would also add the pre-clinical trial here) is the "gold standard" in terms of determining validity and efficacy, asserting that

> statistics, rather than human experience, become the only acceptable means through which efficacy can be established. Studies of traditional medicine that do not employ the gold standard or that assess efficacy in culturally meaningful terms tend to be quickly dismissed as unscientific romanticism (Waldram 2000: 616; see also Edgerton 1992; Eisenberg & Kleinman 1981; Hahn 1995).

The above procedures are also politically manifested. According to the WHO (2000), every herbal medicine available on the international market has to be standardized according to basic criteria for the evaluation of the quality of herbal

medicines[14]. The laboratory therefore aims to substitute a 'disadvantaged' medicinal plant or plant mixture with standardized and more 'advanced' plant extracts and compounds. This approach also supposedly provides 'safe' medicines that protect patients from drug toxicity[15]. The scientific validation process transforms the original plant, method and knowledge and substitutes it with a standardized product with biovalue (Waldby 2002), applicable to the global market (WHO 2000).

> Biovalue refers to yield of vitality produced by the biotechnical reformulation of living processes. Biotechnology tries to gain traction in living processes, to induce them to increase or change their productivity along specified lines, intensify their self-reproducing and self-maintaining capacity (it takes place not in vivo but in vitro, a vitality engineered in the laboratory, where, as Rabinow puts it, the biological fragment is constituted as a 'potentially discrete, knowable, and exploitable reservoir of a molecular and biochemical products and events' (Rabinow 1996: 149) (Waldby 2002: 2000).

The following sections will show that the pure scientific work, which is supposed to be independent of any subjective influences, is, beyond all objectivity, influenced by politics and, as was described earlier, subjective knowledge production. This situation contributes to the scientific assemblage that produces biovalue, which implies the transformation of a 'living process', a medicinal plant and its living knowledge, into a scientifically valuable product. Particularization, abstraction and validation are the main steps in the production of a viable new compound, or the validation of already detected compounds. The following two sections dive into the politics and practices, materials and investigations of chemical compound extraction and the validation of existing compilations such as PHELA.

The Quest for Validity and Safety: PHELA, a "Crude" Plant Mixture

In the process of structural investigation, the plant material is analyzed for its constituents, in particular the molecular mass that characterizes the weight of a specific chemical compound. Traditional medicines are complex mixtures, often made of more than two constituents. To structure these complex processes, the IKS Laboratory works with three approaches to new drug discovery. The first approach is the standard extraction and isolation techniques used to find single new chemical entities. This approach is generally known as the *reductionist approach* and is best

14 For the WHO guidelines (2000), see http://apps.who.int/medicinedocs/pdf/whozip42e/whozip42e.pdf.

15 Studies have shown that the detection of toxins in products of a botanical origin can be problematic (see Steenkamp et al. 2005). This does not mean that medicinal plants are not toxic, but that the identification of such toxic events in patients is not easy to do (Stewart 1999). There is, however, no evidence that traditional medicine is per se toxic.

used for the study of single medicinal plants. The second approach is to develop products that can be used as an adjuvant[16] to current prescription drugs. The third approach evaluates the whole product for its safety and efficacy (informal conversation with Dr. Matsabisa, March 2009).

Most of the Bachelor and Master students at the IKS Laboratory were using the reductionist approach for their research. Brian Sehume, on the other hand, was using the third approach for his Master thesis, entitled 'Pharmaceutical Evaluation of PHELA Capsules Used as Traditional Medicine' (Sehume 2010). In his research, he aimed to evaluate the efficacy and safety of the plant mixture PHELA, a "crude" botanical product consisting of four different plants collected in four different regions of South Africa, but originating from countries outside of South Africa (Mexico, tropical Africa and Asia, tropical East Africa and Brazil)[17]. In an unpublished paper and his thesis, Sehume describes how the original plant combination provided in liquid form revealed "disadvantages," and thus required "further investigation" and ultimately "upgrading" through the provision of PHELA in capsule form.

> A claim will experience scientific upgrading ending in a measured product in capsule, tablet or syrup form (…). In general, the traditional dosage forms some disadvantages: Firstly, they are not easy to keep free from microbial contamination. Secondly, the large volume of preparation required may not be comfortable for patients. Thirdly, the traditional doses measures of a plant medicine are not exact (e.g. half a cup full, two spoonfuls etc.) (Sehume 2009: Document without page numbers).

"Such inaccuracy," Sehume claimed, "will affect the uniformity of the dosing in the individual users" (ibid.). His aim was to overcome these disadvantages and make use of the knowledge of original knowledge holder of PHELA and its potential to "increase energy and the treatment of the disease "muyaka," a disease that causes chest problems, pimpled tongue, high temperature, headaches vomiting and finally a slow and painful death. [To do this] A new dosage acceptable according to pharmaceutical standards needs to be developed" (Sehume 2010: 6ff.).

'Disadvantaged' medicine is a critical term that determines medicinal plants as only valuable once 'upgraded' by science, even though plants often contain value irrespective of the scientific process (which nevertheless helps to detect this value).

16 An adjuvant is a pharmacological or immunological agent that modifies the effect of other agents.

17 In both an unpublished draft paper (Sehume 2009) as well as his Master thesis (Sehume 2010), Brian anonymized the plants using the letters RM, PT, CG and S, according to intellectual property rights requirements. The four plants were bred in the IKS Laboratory's herb garden and later on at the larger plantation site behind the laboratory building. I also do not mention the plant names for intellectual property rights reasons.

In a study, (more details on study) it was found that around 81% of 300 evaluated medicinal plants contained biological activity (Fourie et al. 1992). In another study on antimalarial properties detected in South African plants, it was shown that extracts of 49% of all species exhibited promising antiplasmodial activity (Crouch et al. 2008: 356). Obviously, the biochemical pursuit of new compounds is promising, even though it is not the only way to find new compounds. Screening already existing medicinal plants for new compounds is also an often taken pathway to new discoveries. In addition, the documentation of treatment methods of traditional healers or other knowledge holders, as proposed in the 'Traditional Knowledge Documentation Toolkit' (WIPO 2012), for instance, could also lead to successful new discoveries in herbal medicines. But the core problem with herbal medicine remains safety, and safety can only be guaranteed when tested scientifically and according to WHO standards, i.e. for "microbial contamination, pesticide and fumigation agents, toxic metals or other likely contaminants and adulterants" (Sehume 2010). To stick to safety requirements, basic criteria like time of harvesting of the plant material, stage of growth, and drying and storage conditions should also be documented (see WHO 2004). If these safety requirements are complied with, the new discovery will be further analyzed for different aspects, such as toxicity or "the mechanism of action by which PHELA boosted the immune system" (Lekhooa 2010), as was stated in the paper of another researcher who later also worked on PHELA. Others might investigate "the pharmaceutical quality and its sustainability for use in clinical trials" (Sehume 2010). These processes can, however, only be applied when, prior to safety and efficacy tests, the basis for all tests has been found: the chemical compound.

The Quest for the Peak: Detecting Chemical Compounds

Detecting a new chemical compound requires thorough analysis, a process that can take many months and even years of repetitive, tedious work. Researchers have to go through the same procedures again and again to eventually detect a valuable chemical composition. But what actually happens in the process of identifying a molecule?

The density of molecules and chemical compounds in one plant or a plant mixture is extremely high. The separation methods for molecules must therefore also be very powerful and refined in order to detect new compounds. For the analytical process, separation methods are required on a preparative and analytical scale (Manz et al. 2004). Before plants enter the biochemical process of microanalysis using HPLC and LC-MS techniques, they have to go through some preparatory steps. First, the plant material is cut into pieces, then ground or pulverized; practices that traditional healers also conduct, yet using less refined and high-tech machinery.

The crushed plant material then progresses through further micro processing procedures, performed with further technical devices such as the HPLC and LC-MS.

A note from the blackboard in the staff office of the IKS Laboratory gives an indication of the steps that take place in this process and the sort of language, methods and materials used. The steps below do not explain all work done in the biochemical process. They only introduce first steps, which will then be further proceeded, i.e. in a gravity column, the HPLC/ LC-MS.

DCM 24 (I)

1. Weigh 5 grams of DCM 24
2. Dissolve this completely in MeCn
3. Decant the filtrate (supernatant 200 ml)
4. Re-dissolve the white residue
5. Mix all supernatant of 4 for 5 min
6. Spin the supernatant in 5 for 5 min @ 2 RPM [revolutions per minute]
7. Mix all the supernatants
8. Re-dissolve the residue and repeat step 6

DCM 24 (II)

1. Measure volume of supernatant
2. every 30 ml of supernatant add 70 ml water (distilled)
3. maximum of 300 ml of step 2 into round-bottomed flask
4. Evaporate the MeCn – white milky solution will be final product
5. Slowly freeze only this solution (do not put into -80 freezer)
6. Freeze dry the material
7. Pool all freeze dried materials together

Practices such as measuring, dissolving, evaporating and freezing are common instructions in bio-analytical chemistry. But what do the terms DCM 24, supernatant, filtrate, MeCn and RPM mean? DCM, to begin with, stands for *dichloromethane*, a solvent commonly used in biochemistry for its capacity to dissolve organic material. DCM 24 stands for a medicinal plant (Plant 24) dissolved in DCM.

MeCn (*Acetonetile*) is a chemical compound commonly used as a mobile phase[18] in TLC, HPLC and LC-MS. Another commonly used solvent is, for instance, ethanol (C_2H_6O or EtOH), generally known as (drinking) alcohol. In an interview, the PhD researcher James explained during an informal conversation at the IKS Laboratory in January 2010 that "Traditional healers also mostly use alcohol as a dissolvent. These solvents are miscible [mixable] with water and help to separate other chemical compounds of a chemical composition." With reference to the instructions on the staff blackboard, MeCn was diluted in distilled water and was then used to dissolve DCM 24. To separate out the chemical compounds of this complex, crude mixture, the mixture should then go into a centrifuge to be spun for five minutes at a rate of two RPM. The above instructions stopped at this point but the analytical process still continues. It commonly continues with the evaporated liquid being then filled into a gravity column for gravity chromatography.

Gravity chromatography is a separation method where the analyte (the substance or chemical constituent being analyzed) is contained within a liquid or gaseous mobile phase, which is pumped through a stationary phase. The compounds of the analyte interact differently with the two phases. Depending on their polarity, they spend more or less time interacting with the stationary phase, and thus the compounds can be separated from one another according to the speed at which they pass through the gravity column (Manz, Pamme & Iossifidies 2004: 29). In the gravity column, chemicals are separated according to weight; those with less weight come out of the silicon column first. For a chemical compound like $C_{12}H_3O_{16}H_1$, for instance, the numbers represent the molecular weight of the chemicals.

One of the researchers explained to me "Generally, it is not easy to find new chemical compounds. Often they have the same molecular mass, which define chemical compounds. But they nonetheless look completely different." He quickly drew a diagram of two similar compounds that have a totally different molecular mass to explain the difficulty to distinguish them. For the minor differences it takes such long time to detect a new chemical compound. The two diagrams show two compounds of similar molecular mass, which yet are totally different.

18 A 'phase' in chemistry is a physically distinctive form of matter, such as a solid, liquid, gas or plasma. "Chromatography is used to separate mixtures of substances into their components. All forms of chromatography work on the same principle. They all have a stationary phase (a solid, or a liquid supported on a solid) and a mobile phase (a liquid or a gas). The mobile phase flows through the stationary phase and carries the components of the mixture with it" cf. www.chemguide.co.uk/analysis/chromatography/thinlayer.html (last accessed February 10, 2016).

Figure 9 Two different chemical compounds

The solution extracted through the process of gravity chromatography is again only a preparation for further processes. One of these further processes is TLC (thin layer chromatography), a chromatography technique used to separate non-volatile mixtures (Lewis & Moody 1989). It is carried out on a sheet coated with a thin layer of adsorbent material, usually silica gel or cellulose. After the medicinal plant dissolvent that has been extracted in the gravity column has been applied to the plate, a solvent or solvent mixture known as the mobile phase is drawn up the plate via capillary action. Because different compounds ascend the TLC plate at different rates, separation is achieved. TLC can be used to identify compounds present in a mixture, and determine the purity of a substance, including medicinal plants and their constituents (Reich & Schibli 2007).

After all of these more mechanically applied practices, the eventually separated extract will be further processed in the HPLC machine, which was used by most

students, and the LC-MS machine, which was used more by the doctoral and post-doctoral students.

HPLC and LC-MS: Identification of Unknowns

Molecules, among others, consist of proteins. These proteins react to specific substrates (i.e. ethanol). This happens in the HPLC process and, in an even more accurate form, in the LC-MS machine. Together, these two high-tech chromatographic machines are the core instruments used at the IKS Laboratory. Most of the activities that I observed happened in front of these two high-tech pieces of equipment, especially in front of the chromatogram, the result sheet shown on the attached computer screens. Small samples of previously extracted plant material dissolved in different solvents (ethanol or methanol) were analyzed to extract potentially new chemical compounds. Jaco van Zyl, the scientist engineer specifically employed to work with and introduce visiting scientists to the LC-MS equipment, often spent days with visiting or IKS Lead Program researchers working to detect a compound. I observed him and a visiting scientist from the University of the Western Cape's TICIPS (International Center for Indigenous Phytotherapy Studies) program[19] spend hours together in front of the two computer screens attached to the LC-MS machine. A brief excerpt of a conversation that I followed between the two researchers while they were at work provides an insight into the quest for "peaks": accumulated compounds that indicate a "high biochemical value." The LC-MS machine was, at this point, still new to the laboratory and the language used in front of the screen was as unfamiliar to me as was the blackboard instructions cited above.

JZ: (To JM) Look, you can see between 4.5 and 3.5 the peak is high.
JM: So, do you think it is pure?
JZ: 2.85 is a nice peak, but 2.25 is too little. But it can work.

What do the two scientists purport here? And what actually happens in an HPLC and LC-MS machine? In short, what happens is based on the lock-and-key principle. A mixture that contains proteins runs through a substrate, which either recognizes the structure of the protein (like a key fitting into a lock) and causes a reaction, or it does not and thus there is no reaction. To elucidate the structure of a molecule, highly sensitive and very sophisticated methods are needed (Manz et al. 2004: 23), which are offered by the HPLC and LC-MS.

To increase the resolution that has been previously achieved using TLC and to allow for more accurate quantitative analysis, additional enhancements must be

19 The TICIPS program is a joint venture of the University of Missouri-Columbia, the University of Western Cape and the Missouri Botanical Garden, St. Louis.

done. High performance TLC/mass spectromatry, HPLC/MS or HPLC for short, is a chromatographic technique similar to the gravity column used to separate a mixture of chemical compounds, i.e. an extract of a medicinal plant, with the purpose of identifying, quantifying or purifying the individual components of the mixture. It relies on pumps to pass a pressurized liquid solvent containing the sample mixture through a column filled with adsorbent material. Each component in the sample interacts slightly differently with the adsorbent material. This causes different flow rates for the different components and thus leads to the separation of the components as they flow out of the column (Manz et al. 2004).

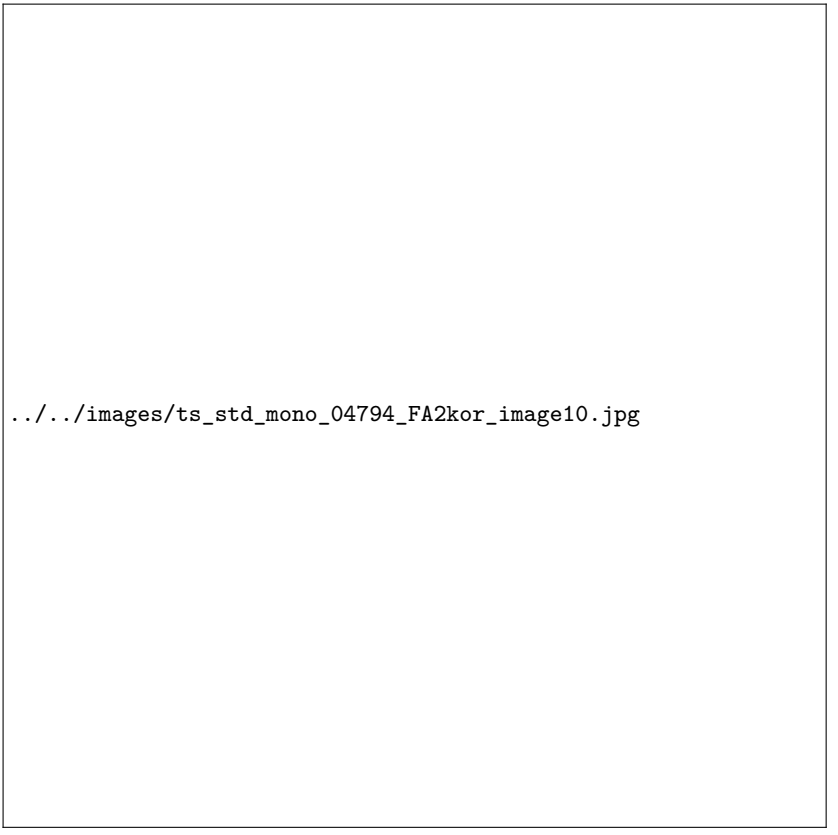
In the analysis of the chemical components of traditional medicine, the HPLC technique is usually used for the separation and identification of a variety of similar structural compounds. It separates according to the molecular mass of the chemical, with the larger compounds taking longer than the smaller compounds to run through the column. This scheme of molecules will appear on the computer screen attached to the HPLC machine as "a peak of compounds," which are represented as a chromatogram on the computer screen known as a "fingerprint" (Sehume 2010). A valuable compound (or as Jaco said above, a pure compound) will show as a high peak on the computer screen. A fingerprint design below shows the density of potential compounds, presented as peaks. A spectra exhibits peaks of the same plant material dessilved with different dissolventsdetected in an HPLC chromatogram of PHELA material[20]. The work at the HPLC is not only to find new compounds, but also to detetct how compounds react on changes. The illustration below, for instance, indicates on the change in chemical compounds after storage time of 24 weeks. This helps to understand loss of efficacy of medicinal plant products.

To reach an even higher level of accuracy in terms of molecule separation and identification, the analysis of plant material is continued in the LC-MS machine, which offers analytical specificity superior to that of conventional HPLC techniques for lower weight analytes (Grebe & Singh 2001). LC-MS is an analytical chemistry technique that combines the physical separation capabilities of liquid chromatography (LC) with the mass analysis capabilities of mass spectrometry (MS). LC-MS has a very high sensitivity and selects, separates, detects and identifies chemicals of particular masses in the presence of other chemicals.

Jaco van Zyl, the LC-MS technical engineer, was mostly occupied with introducing researchers from national universities (such as the University of KwaZulu-Natal and University of the Western Cape) as well as international universities (including Guangzhou University, China) to the complex processes of the LC-MS machine. They often spent many days in front of the computer screen detecting peaks of compounds.

20 For detailed information on the peak samples, see Sehume (2010). It is beyond the scope of this thesis to go into further details of plant biochemesty and analysis here.

Figure 10 The HPLC machine



It is actually the pure compound that the researchers are searching for in their daily, often interminable quest behind the screens of the HPLC and LC-MS machines. Finding such a pure compound is, however, very rare. And if such a compound is detected, it still has to go through further analytical steps in order to determine its value and use in terms of its specific healing applicability. A new compound may be viable for the treatment of obesity or malaria. The plant *Dicoma anomala*, for instance, is a well known and well described medicinal plant in South Africa (see van Wyk et al. 2009: 118). After long-term investigation at the IKS Laboratory, a compound was finally detected that was deemed valuable for its antimalarial properties. But the detected compound then had to be tested in preclinical and clinical trials for safety and efficacy (see also the example of PHELA

above)[21]. These further processes are outsourced to universities, the pharmaceutical industry or private biotechnology companies.

Transformation of Indigenous Knowledge into Scientific Knowledge

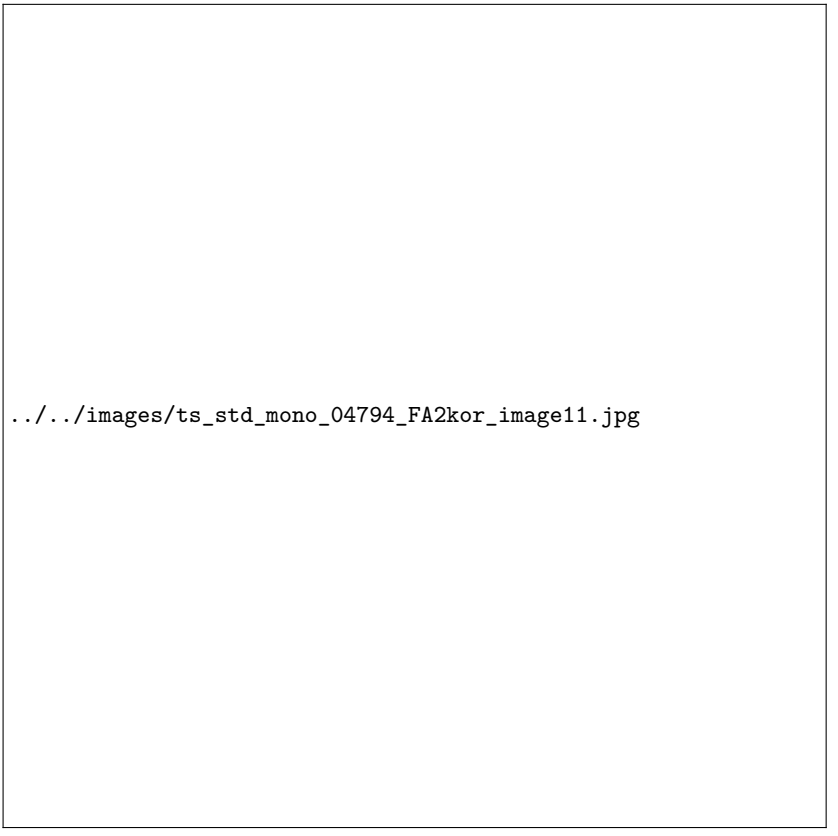
What was eventually detected is the pure compound; the micro-component of the multi-complex constituents of a medicinal plant or medicinal plant mixture. The process of dissecting the compound not only separates "useless" and "useful" biochemical material, but also replaces one knowledge system with another knowledge system. The strong rejection of the old people made by James or the idea of replacing Western scientific knowledge with African systems as proposed by Brian are both part of the knowledge production at the IKS Lead Program. This knowledge production can, as such, hardly be defined as objective and rational, but more an assemblage of specific moments of production, produced by people with distinct backgrounds – i.e. traditional healers of different traditions, scientists with different ethnic and religious backgrounds, machinery from different countries and a continuously changing policy landscape (influenced by national policies as well as international WHO guidelines) – all of which shape the IKS Lead Program. In the transformation process of medicinal plants and indigenous knowledge into a new chemical compound, the knowledge passes through many different steps of abstraction, particularization and validation and is the knowledge passes through many different steps of abstraction, particularization and validation and is dependent on the multiple influences that create the space of the IKS Laboratory dependent on the multiple influences that create the space of the IKS Laboratory.

Figure 11 below elucidates the trajectory of the knowledge of medicinal plant material that comes from indigenous knowledge holders into the laboratory. The cultural values attached to the knowledge basically remain outside of the laboratory's walls. Although largely replaced by scientific knowledge systems and practices, a marginal part of the original knowledge does, however, remain in the discovery process of the compound and may eventually lead to further developed products. It is not the knowledge in its original form but a reduced part of this knowledge. This knowledge hardly matters for the scientific process. And yet, in ABS agreements, which will be discussed in the following chapter, such knowledge plays a major role, since ABS agreements deal largely with the cultural value of knowledge, and not only with the biovalue that derives from scientific investigation that is detected *in vitro* or the economic value of a potential product. ABS agreements deal with the remains of the cultural value inherent in all products that have their

21 Pre-clinical and clinical trials are not the main focus of this research. For more detailed literature on clinical trials, see i.e. Lurie & Wolfe 1989; Petryna 2005, 2007, 2009; Pogge 2006.

origin in indigenous knowledge (even though the scientific process essentially removes this cultural value).

Figure 11 The transformation of indigenous knowledge at the IKS Laboratory



In the goals and mandate of the IKS Lead Program, indigenous knowledge played an ambivalent role, especially under the auspices of the program's mission to support and promote indigenous knowledge systems. So how far is indigenous knowledge integrated into the educational and job creation mandates of the IKS Lead program?

Additional Mandates: Educate, Use and Develop

The IKS Lead Program has flagged the support and promotion of indigenous knowledge systems among its primary goals. Promotion includes education. The educational mandate implies teaching traditional healers about prevalent diseases such as HIV/AIDS and tuberculosis, as well as teaching pupils, students and other citizens about traditional knowledge, medicinal plants and biochemistry. Among others, the IKS Lead Program participates in National Science Week, which forms part of the IKS Lead Program schools outreach program, which

> (…) is committed to educating our communities and bring science back to the villages. We at IKS believe strongly in developing our foundation of science and traditional knowledge at the foundation phases. The Lead Program's outreach program aims at educating pupils about their traditional knowledge and to value such knowledge[22].

These objectives pose questions. Why would the IKS Lead Program deem it necessary to teach pupils about knowledge that many will have grown up with? It does make sense for a scientific institution to bring "science to the villages" and also to choose young people as a target group for developing "our foundation of science and traditional knowledge," but why should a scientific institution teach about traditional healing? With these questions in mind, the next section shows how the IKS Lead Program put its educational mandate into practice.

Educating the Neighborhood: National Science Week at the Laboratory

The Cape Flats are mostly populated by black and colored people. The unemployment rate is very high[23] and future job perspectives for young people are limited, especially when it comes to academic education and a later academic career. Usually, access to the compound of the IKS Lead Program is restricted and it is fairly isolated, with researchers or other appointed visitors only occasionally coming to the laboratory. But for one week in August 2009, the compound changed into a vivid fusion of the world of scientific biochemistry and the world outside of the compound, represented by young pupils of the surrounding communities and other invited guests, among them traditional healers. This gathering took place during the South African National Science Week, where about 1500 young pupils were invited to visit the IKS Laboratory to gain insight into biochemical and pharmaceuti-

22 www.mrc.ac.za/iks/iksclinical.htm (last accessed August 8, 2004).

23 In 2011, the unemployment rate was estimated to be at 38%. See: www.capetown.gov.za/en/stats/2011%20Census%20%20Planning%20District%20Profiles/Cape%20Flats%20Planning%20District.pdf.

cal research. For this event, the IKS Lead Program's staff members had thoroughly prepared the laboratory facilities. The technical equipment had been arranged, the laboratory rooms cleaned, the herb garden in front of the laboratory weeded and watered, and a huge festivity tent was built next to the laboratory buildings. National Science Week is a nationwide annual event in which various scientific or science-relevant institutions bring science closer to South African citizens. In 2009, the IKS Laboratory in Delft invited pupils from secondary schools in the neighborhoods of the Cape Flats to visit the facilities, also as an opportunity to explore science as a potential career.

For the whole week, staff members showed student classes around the laboratory. They explained the functionality of the technical equipment, introduced some of the chemical solvents and described the biochemical processes that a medicinal plant must traverse from being a raw plant, or part of a plant, to being a detected chemical compound of pharmaceutical interest. The usually quiet and secluded atmosphere of the laboratory turned into one of activity and engagement between scientists and pupils. For most of the students, it was their first time seeing a biochemical laboratory from inside. I followed some of the classes through the laboratory and felt reminded of my own school excursions to art exhibitions or old churches, where boredom, heavy limbs and tired eyes would suddenly turn into silly giggling with classmates while others absently stared into space. A few pupils, however, did listen attentively and asked interested questions. Possibly, the lack of attention of the others was due to the overwhelming novelty of the subject and basic language problems. The pupils' main language was isiXhosa, while English, their second language, was spoken by many only with difficulty. Since none of the presenting IKS scientific staff members were native Xhosa speakers, the presentations were held in English.

After being shown around the laboratory and being introduced to the main facilities and techniques, the students moved to the adjacent office building, where two traditional healers awaited them in seminar rooms to give lectures on traditional healing and traditional medicinal plants. I had the impression that the pupils were more attentive in these lectures and discussions with the healers than they had been with the scientists, perhaps because of the closer proximity in terms of language and subject matter (one might assume that most of the pupils had heard of traditional healing practices before and could thus more easily connect with the topic). Later, Dr. Mayeng of the Department of Health also gave a short talk about the importance of traditional healing for South African society and the national health system.

National Science Week was one of many activities carried out by the IKS Lead Program. My observation of the events in 2009 revealed the entanglement of science (represented by the scientists and the laboratory), politics (represented by Dr. Mayeng), the public domain (represented by the pupils), indigenous people and

knowledge (represented by the traditional healers), technical equipment (represented by the laboratory itself) and medicinal plants (represented by the plants in the adjacent herb garden as well as the plant material in the laboratory). To enable this implicit synthesis between science and traditional healing, the IKS Lead Program collaborated with traditional healers from all over the country. The assistant to the IKS Lead Program director, Mirranda Javu, a Xhosa and English speaking 42-year-old traditional healer, represented this integration like no other staff member. As a healer and member of the Western Cape Healers Association, she had access to a huge national network of healers. Resulting from this network, the IKS Lead Program and traditional healers were engaged on various levels. Firstly, healers worked as educational trainers during events such as National Science Week, as well as being facilitators during trainings outside of the laboratory, where they transferred the knowledge they received at the laboratory to the communities.

This led to the second engagement. The IKS Lead Program trained healers in courses such as the Traditional Health Practitioners Awareness Training Program on Tuberculosis, HIV and AIDS (see Matsabisa et al. 2009). The huge tent erected next to the laboratory building for National Science Week was to celebrate the healers having attended a program on tuberculosis. In the late afternoon hours, the tent was filled with about 200 healers who had come from the surrounding townships to receive the certificate that indicated their participation in the training course. Dr. Matsabisa handed over the certificate to each healer individually, always followed by the enthusiastic applause of the other healers. Finally, the IKS Lead Program continually worked on the integration of indigenous knowledge systems into national policymaking. For instance, Dr. Matsabisa and Dr. Mayeng were engaged in advising the government on the further integration of indigenous knowledge systems into legislation.

Another way of reading these integrative efforts could be to look at the superiority that science demonstrated with regard to indigenous knowledge systems, as they integrated indigenous knowledge and traditional healers into the scientific realm; a task that was promoted with the promulgation of the IKS Policy in 2004. At the IKS Lead Program, science fused with indigenous knowledge systems. The healers were allowed to represent their own knowledge system – as teachers about traditional healing, for instance – but they remained dependent on the framework and requirements of the IKS Lead Program. Science did therefore include indigenous knowledge systems, but the inclusion was ambiguous and, when listening to the voices of the healers, was not done "well enough." Teaching the same content in a township, independent of the program, would possibly not find so many listeners. Indigenous knowledge thus experienced an 'upgrade' by being taught in a governmental scientific institution. The statement of the healer above shows that this authority was not necessarily perceived as integration, but was questioned as evidence of paternalism. Furthermore, the focus group discussion that I conducted

with healers at the IKS Lead Program revealed a certain disdain for the interaction between the scientific and the indigenous realm. The interviews with scientists about their perceptions of healing also revealed a similar sense of disdain, ranging from the total denial of traditional healing to ambivalent acceptance. On the other hand, the healers made use of this integration by being taught about prevalent illnesses, such as HIV/AIDS and tuberculosis. The IKS Lead Program, in turn, profited from the input of the healers in new drug development and by integrating them into their mission of "educating communities." While this could be read as a win-win-situation, for both sides it seemed to be more of an ambivalently perceived encounter.

The next section deals with the additional mandate of the IKS Lead Program: the use and production of medicinal plants for local economic development and job creation. To do so, the focus will shift away from the laboratory to a *Sutherlandia* plantation site in De Doorns, Western Cape.

"Sowing the Seeds of Hope": Sutherlandia Plantation Site Project

The sowing of the first seeds of *Sutherlandia frutescens* was celebrated at the opening ceremony of the 'La Serena' project, a *Sutherlandia frutescens* plantation site in De Doorns, in June 2009[24]. La Serena was located in the Hex River Valley, surrounded by the Hex River Mountains, the second highest mountain range in the Western Cape. These particular surroundings create a Mediterranean climate, which serves for the cultivation of wine as well as medicinal plants. La Serena was a vineyard before the two-hectare plot of land was transformed into a plantation site for *Sutherlandia*. It took me a substantial amount of time to receive permission to conduct interviews with the plantation site workers from the IKS director. I could not at the time understand why he was so reluctant to let me visit the plantation site, though I realized later that it was for political reasons (of which I only came to understand small bits and pieces, as they were never disclosed to me). But in August 2009, eight months after my arrival, I was finally allowed to join Gustavo, La Serena's project manager, on one of his weekly supervisory visits to the plantation site.

The La Serena plot lay within sight of De Doorns, a small settlement in the Breede Valley Municipality, roughly 140 km north of Cape Town. In 2009, De Doorns was known in the South African news for xenophobic violence against immigrants from Zimbabwe. The Zimbabweans were evacuated to a refugee camp next to the N1 national road to Johannesburg after being chased out of De Doorns following violence based on job competition. The (mostly) colored population of

24 www.mrc.ac.za/iks/seeds.htm (last accessed May 1, 2012; the link was deleted with the liquidation of the IKS Lead Program in 2014).

De Doorns was habitually employed in the wine industry, with seasonal employment during the grape picking season in autumn. For the seasonally dependent wine industry, additional workers are always in demand during the summer and autumn months. The general wage of the workers at the time was about 60 Rand (6 Euros) a day. Immigrants from other African countries, however, would work for less, given that this amount was still more than any wage they would get in their home countries. "Residents called the Zimbabweans dirty, accused them of practicing witchcraft and said they offered themselves as cheap labor, leaving locals unemployed," reported one news article[25]. This particular situation partly stemmed from the fact that De Doorns had the highest unemployment rate of the entire Breede Valley Municipality, with 60% of residents being unemployed or having only seasonal employment. The level of economic insecurity and poverty was high and poverty alleviation one of the targets of the municipality in its long-term growth and economic development strategy[26]. One project that manifested in this strategy was based on public-private partnerships between groups of organized entrepreneurs, private sector companies and research institutions. The project particularly focused on medicinal plants as an income generating strategy.

La Serena was one of three pilot projects in the Breede Valley, all of which fell under the title of 'New Entrants into the Pharmaceutical Industry Initiative'. It was based on a partnership between the Breede Valley Municipality, the Western Cape Department of Social Development, the Medical Research Council and the private company Zizamele Herbs[27]. The project was organized under the lead of the IKS Lead Program. La Serena was implemented as an "Empowerment and Poverty Alleviation Program to facilitate economic growth and to develop interventions that will create sustainable employment and ownership"[28]. Ten people were employed on the plantation to sow, grow and harvest *Sutherlandia frutescens*. But the project had experienced ups and downs since its initiation, and on the day that I finally received permission to visit La Serena in August 2009, I only found George, the project coordinator, Thomas, the co-coordinator, and George's two daughters (all of whom were colored people) as the sole employees. All of the other employees (black people) had left the project, aggrieved. When I asked George where the other workers were, he claimed:

> They didn't want to work with us. They only work with themselves. You see, they worked on that side [of the plantation] and we worked on that side. That's how

25 See Lewis (2010)

26 See: www.mrc.ac.za/iks/seeds.htm (last accessed May 1, 2012; the link was deleted with the liquidation of the IKS Lead Program in 2014).

27 www.zizamele.com (last accessed September 12, 2014).

28 See: www.mrc.ac.za/iks/seeds.htm (last accessed May 1, 2012; the link was deleted with the liquidation of the IKS Lead Program in 2014).

> they worked. They are Xhosas. The family lives in the Eastern Cape, Queenstown. And then they just stayed away. But they all still get their salaries. They get the salaries and we do all the work (Excerpt from fieldnotes, December 2009).

According to George, the black people had left "because they don't like to work." The Department of Social Development paid a monthly salary of 800 Rand. Initially, George and his co-workers were promised 1900 Rand per month, but "the Social Department came and they said that we only get 800 Rand," explained George in a later interview.

George lived right next to the plantation with his wife and two daughters. He and his family lived a simple life without much comfort. But although the income he received from the plantation was relatively low, it was at least stable compared to the seasonal salaries paid on the surrounding vineyards. George was proud, enthusiastic and passionate about more or less being his own boss on the plantation site. For him, "*Sutherlandia* is the global solution. Plants are very important, because most of the people, they are born with the cancer and that's why *Sutherlandia* is there to help them. *Sutherlandia* is a solution, not only for Africa, but for the whole world" (informal conversation, December 2009). When emphasizing the fact that he was helping "the whole world," his eyes sparkled. He disclosed later that he wanted to be the project manager of a huge medicinal plantation site, which would provide the "whole world" with plants from De Doorns. He was unaware of the fact that *Sutherlandia* had so far not gone through all of the necessary safety and efficacy tests and clinical trials in order to be exported internationally.

Figure 12 The plantation site with George, Site Manager

George had been trained as a social entrepreneur at Zizamele Herbs in Barrydale in the Klein Karoo region, about 200 km away from De Doorns, and he planned to continue with further training. He even had future plans beyond his employment at La Serena: "I now go for another training course. I do this and then I have experience, and then I start my own project." He knew that one needs to be prepared: "If you start a business, you need to know your market. You must have a market. If your market is ready, then you get your business." George understood himself as a businessman, who had nothing to do with traditional healing. "We are crazy with medicinal plants, not with these astrologies and *sangomas*. That is not my interest, because I know nothing about this. My training was about medicinal plants" (from focus group discussion with the plantation site workers, February 2010). In case he and his family became ill, he said that they consulted a medical doctor. George simply wanted to be a successful entrepreneur, for which medicinal plants were a

means to an end. Access and benefit sharing and intellectual property rights played no role for him, since he did not work with the knowledge of indigenous people. He learned about plant breeding at workshops at the small Zizamele Herbs company. Plantation site workers were simply suppliers of plant material. For George and his family, medicinal plants had an economic value. The emotionality that arose in him with regard to medicinal plants as "the global solution" may be related to the fact that medicinal plants provided a means of survival.

With the La Serena project, it could be said that the developmental mandate of the IKS Lead Program was, to some extent, accomplished, but with only limited success. It basically fed one family. And yet the IKS Lead Program director believed in the value of medicinal plants as providers of economic development. Medicinal plants like Buchu *(Agathosma)* or aloe vera feed a large industry in South Africa. The Breede Valley Municipality had other plantation sites with rosemary and thyme for the cosmetic and food industries; an easier terrain, as these plants do not require further scientific approval. However, *Sutherlandia* may still become an economically highly valuable plant, similar to aloe vera or Buchu, and be sold internationally, once all relevant tests have been done.

La Serena was affected deeply by many challenges, including ambivalent positions towards medicinal plants and indigenous knowledge, personal misunderstandings between Dr. Matsabisa and the overall project manager Gustavo Alfaro, as well as the inter-ethnic problems between the colored and black workers. Nevertheless, at the end of the season in February 2010, Zizamele Herbs did buy the harvested plants and George was proud about "his" project, which enabled him to feed his family independently of the wine industry.

The point of La Serena for all involved participants, and its limited success, was economically-oriented: to generate income in an economically deprived area. In this context, the knowledge of *Sutherlandia* did not come from indigenous knowledge holders, nor was such knowledge sought; rather it derived from the Zizamele Herbs company. As the following chapter will show, however, even knowledge about a common plant like *Sutherlandia* could also become contested.

Conclusion and Outlook

At this point, the transformation of *muthi*, or any other relevant plant mixture, comes to a first pause. At the IKS Lead Program Laboratory, the interest in indigenous knowledge was essentially based on the quest for chemical compounds, and the identification of their efficacy, safety and patentability. The formal national and international market prefers standardized capsules and tablets to raw and crude medicinal plant mixtures that may contain toxic elements (from pesticides, for instance). Thus "[i]n the very moment that indigenous knowledge is proved useful

to research and development through the application of science, it is, ironically, stripped of the specific characteristic that could even potentially mark it as indigenous" (Agrawal 202: 292).

This particularization, abstraction and validation process is, basically, a process that promotes the biovalue of medicinal plants for the economic market. (Indigenous) knowledge and plant material may thereby be turned into a globally accepted and commercially viable product. Lesley Green, associate Professor at the University of Cape Town, who together with students also visited the IKS Laboratory in 2008 asked the previous manager of the IKS facilities "Are there plans, once the efficacies of plant medicines are proven, to promote low-cost health care by teaching people to garden with medicinal plants and dose themselves appropriately?" "No!" he responded, "this is a capitalist company" (Green 2008: 48).

The standardization process is, however, influenced by the subjective interpretations, intuitions, views and attitudes of the involved scientists. This does not imply that all scientists working at the laboratory are against indigenous knowledge systems or their representatives per se. Indeed, their opinions about traditional healers and traditional healing were ambivalently positioned along a continuum ranging from respect and acceptance to rejection and even anger. Indigenous knowledge was similarly accepted by some, but nevertheless also treated like "rejected knowledge" (Laguerre 1987: 11). This implies that even a practice such as scientific investigation, which is often defined as 'objective', is liable to subjective interpretations as well as influences from other knowledge systems, an observation that defines science as yet another local knowledge system (Watson-Verran & Turnbull 1995).

The additional mandates of the IKS Lead Program were also ambivalently torn between the (ab)use of indigenous knowledge holders and medicinal plants, and the attempt to make use of medicinal plants and associated knowledge for the benefit of the knowledge holders or other less powerful citizens (like George and the other plantation site workers). This is not to say that all activities at the IKS Lead Program were conflictive. But it does show that all activities were driven by the good intention to "promote and support indigenous knowledge systems," but turned out to be ambivalently town between making use of medicinal plants and indigenous knowledge on the one hand, and the more idealistic attempts to support them on the other, and between adjusting to market-driven needs and the attempt to promote African values and cultural heritage. This balancing act continues (to an even greater extent) in ABS agreements, which are essentially an attempt to bridge the two systems with adequate politics. The next chapter will deal specifically with this balancing act. It continues to follow the trajectory of medicinal plants and associated knowledge, this time out of the laboratory and into the politics of access and benefit sharing and intellectual property rights, and examines how these challenges the divergent actors involved.

Chapter VI
ABS – A Stony Path Towards Sharing: The Chances and Challenges of Access and Benefit Sharing

Gift or Commodity?
Mark Osteen (2002)

ABC in South Africa: The "Best Case" Hoodia Gordonii

Hoodia gordonii is a thick, fleshy succulent plant that grows in the Kalahari Desert, a region that stretches from South Africa via Namibia to Botswana. For generations, the San people have chewed the edible plant on their hunting trips through the Kalahari to stem off thirst and hunger. In 1963, the Council for Scientific and Industrial research (CSIR) – which, aside from the Medical Research Council (MRC), is one of the largest research institutions in South Africa – used knowledge gathered on *Hoodia* during colonial times in a research project into the plant. After a long research period, the CSIR finally extracted a new chemical compound called P57, which was patented in 1996. Further development was delegated and licensed to the British pharmaceutical company Phytopharm. After Phytopharm closed down their Natureceuticals group, the further development was licensed to the US pharmaceutical giant Pfizer, and later to the consumer giant Unilever. Unilever developed a SlimFast product containing P57. In the meantime, *Hoodia* traders in South Africa and Namibia were engaged in the cultivation of about 300 hectares of *Hoodia* plants. Some even changed their cultivation program from other plants to focus exclusively on *Hoodia*. Unfortunately, Unilever suddenly dropped completely out of the production of the *Hoodia* SlimFast product after clinical trials found it to cause vomiting, high blood pressure and other side effects, but no weight loss[1]. A study initiated by the CSIR, by contrast, showed that the succulent's extracts were "generally safe and well tolerated" (Starling 2011). However, since Unilever's withdrawal no other company has been interested or become involved in continuing research

1 "Would-be fat-fighter Hoodia nothing but side effects", October 29, 2011 (www.reuters.com/article/2011/10/28/us-hoodia-idUSTRE79R6AI20111028).

on *Hoodia* and associated products, and thus the *Hoodia* market came to a standstill, or one could even say breakdown. Those plant traders who had put their hopes in the hype created around the succulent experienced serious financial losses. The challenge is that without the necessary continuation of research, the plant does not have much of a chance on the international market. While this might seem like a normal story of research and development, patenting and licensing, the interesting and unique part is that the CSIR decided to participate in an ABS agreement with the San community in the year 2003. The negotiated royalties were set at 3% of all benefits that the CSIR would receive from *Hoodia* products. Before Unilever dropped out, the San community had received around 500,000 Rand. After their dropout, no further benefits were passed to the San community. Those who had placed their hopes in the commercialization of the plant now had to realize that there was no market future, at least not in the formal pharmaceutical and dietary market. The market basically came to a standstill. However, the ABS agreement between the CSIR and the San Council was referred to as "historically significant in symbolizing the restoration of the dignity of indigenous societies" (Ngubane 2003).

In 2009, *Hoodia gordonii* was the only ABS agreement in South Africa, which – to a limited extend – released monetary benefits. And it is probably the most discussed plant in the academic and political debate around bioprospecting for traditional medicinal plants (Wynberg et al. 2009; Wynberg 2004; Vermeylen 2007; Flint 2012). In 2009, Rachel Wynberg, a leading environmental scientist at the University of Cape Town, Roger Chennels, the lawyer who supported the San in their ABS agreement, and Doris Schroeder, a professor of Moral Philosophy at the University of Central Lancashire, took *Hoodia* as an entry point to discuss ABS in their book 'Indigenous Peoples, Consent and Benefit Sharing. Lessons from the San-Hoodia Case' (2009), a subject that until then academically had been little discussed in South Africa. The book is a milestone in the South African discourse on traditional knowledge, medicinal plants, and ABS. It was launched in January 2010 at Kirstenbosch Botanical Garden as part of the ABS training course that I attended. The book showed that *Hoodia gordonii* is a plant, which is the product of many discussions, controversies, meetings and political exchanges that directed the field of bioprospecting into a socio-political arena concerning human rights, access to natural resources, law, equity, human rights and environmental sustainability (Wynberg 2003). Hoodia *gordonii* thus stands exemplary for the chances and challenges access and benefit sharing agreement politics offers, for failings in ABS, but also for new opportunities and ways forward; chances and challenges not only for local communities like the San, but or traders, scientists as well as for the nation state.

Introduction

I chose to start the chapter with the *Hoodia gordonii* case, because it was a recurring example during the first research year and it stands exemplary for the failings, but also for the chances ABS offers. The previous two chapters illustrated how medicinal plants and associated knowledge are transformed from properties bound to social relations into scientifically and commercially usable property in science. In traditional healers communities, a property given away by someone (or a group of people) is imbued with the identity of its owner(s), which causes the property to have an authority, that compels the recipient to reciprocate. This exchange inevitably leads to social bonding and deepens social relations as well as obligations. Once knowledge and plants become involved in an exchange beyond the cultural rules of knowledge exchange within traditional healers' communities, they transform from having a gift status to a commodity status, bound to political and legal regulations.

The current access and benefit sharing (ABS) legislation attempts to bring these two types of property and exchange systems together. In ABS negotiations, like the one above on *Hoodia gordonii*, these exchange systems meet, and sometimes collide. People who work in the field of bioprospecting, such as scientists and medicinal plant traders, generally expressed their struggles with implementing and applying the legal and political ABS regulations. These struggles have their origin in the political attempt to overcome past inequalities and injustices and to integrate indigenous knowledge holders equitably in ABS; for instance, by seeking solutions for how to substitute spiritual and healing value in an economy-oriented value system. In a market predominantly interested in economic values, this endeavor poses a number of challenges to the stakeholders involved in bioprospecting. This chapter looks at these challenges that come with the well meant but difficult to apply ABS regulations.

The chapter continues with looking at moment, when the two systems meet in ABS agreements. It is a meeting of two different ways of experiencing law, and leads, in case of success, to a fusion of these two systems. The chapter then moves on to an ABS training course in Cape Town, where ABS implementation was taught and discussed among stakeholders from mostly African countries. The course displayed the political and legal relevance of and expectations contained within ABS. Moreover, the views of representatives of the Medical Research Council's (MRC) Intellectual Property Unit and of the IKS Lead Program, traders working with medicinal plants, as well as a description of a *Hoodia* Task Force Group meeting dealing with the *future* of the *Hoodia* market, will all bring to light the challenges that ABS regulations bestows on its actors, but also the ambivalently discussed opportunities for business as well as local community empowerment that come about with its implementation on the ground. These different cases and its actors might first

seem to lack coherence. But in fact, all three – the ABS training course, representatives from the MRC and IKS Lead Program, and the *Hoodia* Task Force Group meeting – must deal with similar challenges and questions, which will be discussed in this chapter: How do or can stakeholders implement the politically enforced ABS regimes, if at all? How do or can they make use of ABS and what challenges do they come across? How and in how far are benefits shared, if at all? What needs to be improved to make better use of ABS?

When looking at these accounts of the different stakeholders, ABS at first comes across as inapplicable. And indeed, there remain a number of obstacles and challenges that have to be overcome. But as has already been hinted at a couple of times before, the mélange of different values, open questions and vague directions in ABS also produces facts and hopes, which may fail and turn out to be an illusion, or they may find a way into application and new forms of local empowerment and agency, and national (economic) development. The chapter continues with illustrating how stony the path towards ABS agreements is, and why these agreements seldom materialize. This opens the space for chapter VII, which will then illuminate the opportunities that ABS and also the protection of indigenous knowledge under the current intellectual property law offers.

ABS: A Stony Path Towards Sharing

Politically defined tools to protect knowledge have, in the last two decades, become obligatory for all bioprospecting activities. At the international level, this came with the CBD in 1993 and the Nagoya Protocol on Access and Benefit Sharing, which South Africa ratified in January 2013, and at the national level in South Africa took shape in the Biodiversity Act in 2004 and the regulations on Bioprospecting, Access and Benefit Sharing (BABS) in 2008. With these new regulations, bioprospectors have to conform to the following regulations: 1) Prior informed consent (PIC) has to be sought before any bioprospecting activity can start. This guarantees the consensual agreement of the knowledge holders to share their knowledge. PIC is thus the first step to guarantee that the knowledge holder is informed about the procedures of product research and development. 2) A non-disclosure agreement (NDA) stipulates the confidential treatment of transferred information, and ensures that it is only used for the agreed upon purposes[2]. The knowledge discloser agrees that the respective information will not be disclosed to any other institution. Ownership of the knowledge is at all times vested in the discloser(s). 3) When a product emerges from the disclosed information and material, an ABS agreement has to be

2 See, for instance, the NDA agreement between the Kukula Healers and the Company Godding & Godding, chapter VII.

negotiated, which acknowledges the value of the shared information and ensures the redistribution of this value. 4) Finally, a co-patenting agreement is made, with the original knowledge holder having rights to the patent.

From Gift to Commodity Exchange

The objectives of these ABS tools are to prevent biopiracy and allow for the protection of the disclosed knowledge, the knowledge disclosures, the knowledge receivers and the fair sharing of benefits. They also replace traditional forms of knowledge protection, as they were laid out in chapter IV, with new, politically enforced knowledge protection schemes. But the (indigenous) knowledge that is protected under these new protection schemes still contains the values of the ancestral past and the spiritual and healing values of the present. The knowledge, once disclosed and thus opened up for the public, thus comprises both the traditional and the enforced political protection schemes. Both schemes are thus cohesive when ABS is negotiated. This process can be compared to what Anna Tsing claims when she says that a commodity is never a commodity without its pre-commercial status, and that it will always slip in and out of a commercial state:

> Capitalist commodities gain value through conversions from non-capitalist transactions (…) despite the power of capitalism, all capitalist commodities wander in and out of capitalist commodity status. (…). Capitalism always requires non-capitalist social relations to accomplish its goals (…) despite all the apparatus of private property, markets, commodity fetishism, and more, taking the gift out of the commodity is never easy (Tsing 2013: 22ff.).

Hence, in ABS, a commodity-to-be is would never have gotten to the point of commoditization without the pre-commercial status, the actual value of the disclosed knowledge and the exchange system attached to it. As described in chapter IV, the knowledge exchange system in a traditional healers community, predominantly organized along gift exchange principles, happens within the boundaries of the *impande*, with the ancestors serving as moral guides controlling the exchange process. This protective and regulatory space is no longer relevant once the plant material and knowledge are given over to a commodity-oriented and economic value-based system, at least not for the companies or research institutions working with it. This space is basically carved out at the moment of knowledge disclosure to the third party. With the turnover of plants and knowledge to this commercial value system, the plants and knowledge shift to having the status of commodities, and thus further exchange will be organized according to the rules of the economic market.

The transition from gift to commodity exchange therefore entails the cutting out of former social relations and replacing them with political regulations, which

stipulate new forms of interaction and engagement between knowledge discloser and knowledge receiver. Social relations do, however, still play a significant role in these new modes of knowledge protection. The plant exchange in Thulamahashe, for instance, illustrates how much the creation of mutual trust between the healers and the K2C committee and Natural Justice was an integral part of the exchange. ABS can thus be regarded as a commodity exchange system that comprises parts of a gift exchange system, with PIC, NDA, ABS and co-patenting acting as political and legal synonyms for securing the values of gift exchange against economic abuse within the commodity exchange system.

The Comaroffs framed this substitution of local legal structures by political and legal instruments using the term *lawfare*, the use of law to achieve political and economic ends (Comaroff 2001; Comaroff and Comaroff 2006: 30f.). Lawfare pushes local communities to "render cultural identity into the language of copyright, sovereignty, and patent" (ibid.). This description makes it sound like everything that is based on the commoditization of property leads to a digestion of cultural traits into the capitalist system. As proposed above, I would rather suggest looking at these processes as synergetic, where local communities adapt to enforced political requirements, but nevertheless aim to keep their own structures alive. Engaging with PIC, NDA, ABS and co-patenting does not automatically lead to the giving up of local legal and political structures.

However, it is the expected economic value of the potential benefits that arouses expectations, hopes, desires and protective measures among the actors involved in bioprospecting (even when, as has been described in the previous chapter, the chance of discovering a new chemical compound, method or cosmetic product is relatively low). In the new political system of post-Apartheid South Africa, the idea flourished that everyone would be able "to speculate and accumulate, to consume, and to indulge repressed desires" (Comaroff and Comaroff 1998: 284). This was stoked by the anticipation that everyone would be able to participate in the wealth and new entrepreneurial enterprises (Comaroff & Comaroff 1999, 2009) promoted by neoliberalism, even though for the vast majority, these hopes would pass them by without offering any visible enrichment (Comaroff & Comaroff 2001). "New situation[s]," Evens-Pritchard wrote in Witchcraft, Oracles and Magic (1937), "demand new magic," and so the new global bioprospecting era aimed to "yield wealth without production, value without efforts" (Comaroff and Comaroff 2000: 313f.), simply by opening up secrets that for millennia had been protected by tradition and customary rituals. Hope and desire to participate is nurtured by the image of the "magical moment" of a "millennial capitalism" that "presents itself as a gospel of sal-

vation: a capitalism that, if rightly harnessed, is invested with the capacity wholly to transform the universe of the marginalized and disempowered" (ibid.: 292)[3].

In the case of bioprospecting, these hopes and desires are wishfully projected onto a field where maybe only one in hundreds of screened medicinal plants may offer a chance for such dreams to come true. An even then, the path remains brittle, as the *Hoodia gordonii* case showed. The salvation promised by financial participation in the big cake of the knowledge economy will for most remain unfulfilled, with such hopes created through potential – but most probably never materialized – ABS agreements. In chapter V, I described the unlikelihood of a plant or plant mixture that is submitted as a claim to the IKS Lead Program ending up in the laboratory. The plant exchange in Thulamahashe, which represents many other similar cases, also shows that the likelihood of getting involved in ABS is very limited. The expectations and hopes rest not only in indigenous communities, but also in the nation state and all other relevant stakeholders working in the field of bioprospecting. But where there is hope, one also finds frustration, disappointment and deadends. The following sections illustrate why these hopes so rarely materialize.

What and Where Is 'the Community'?

In an interview conducted at the IKS Lead Program Laboratory, the post-doctoral student Nchinya Bapela (Benni, NB) briefly summarized some of the central challenges and opportunities that ABS agreements bestow on a scientific institution like the IKS Lead Program (as well as other institutions). He was the first to clearly define the difference between a medicinal plant as alienable property and knowledge as inalienable property, and both of their roles in ABS agreements. The focus on knowledge as an inalienable possession inevitably links ABS to IP protection. It is therefore difficult to separate the two:

> *BR:* What is property for you? In terms of plants, do plants belong to anyone?
>
> *NB:* You see, this is what people are confusing in terms of intellectual property. Property is the knowledge of using that plant. Everyone can see the plant, which is growing there. It is God who put it there. But the knowledge of using that plant for a certain thing, it is if I know something that others don't know, then it is my property. So put, I can't stop you from harvesting [it], but the knowledge for using [it] is my property.
>
> *BR:* Healers say the knowledge comes from the ancestors. So to whom does knowledge in the end belong?

3 This hope can be compared to the hopes projected in millenarianistic movements or cargo cults, where hope was bound to religious leaders or 'white ancestors' bringing goods and messages that would redeem suffering on earth (Cohn 1970; Jebens 2004; Kaplan 1995; Rutert 2010).

NB: Well, if my ancestors give me that knowledge, say of using that medicine for this [problem], don't you think that they are giving that knowledge to me, [it] is my property? The other thing is, if my forefathers give it to me, it means it is my family's property. And that's how property has been passed on from one generation to the other.

BR: But when the same plant grows in the next community as well, then there is a problem because a plant does not grow at one specific place.

NB: Yes, but my community, where I come from, there is somebody or people in the community that had that knowledge of using that plant or this herb and other communities they don't know this. The 'community access' way is not perfect, but [it is] the way they are going to do it in South Africa. Look, if then by 'communities' [it] means putting schools in poor communities and not only giving money, putting infrastructure for them, then it will work.

Benni differentiated between the actual plant material, which basically belongs to the public or to a private landowner, and knowledge, which belongs to the respective knowledge holder(s). ABS mostly involves the intangible property – knowledge – and not so much the tangible property – medicinal plants. With the focus on knowledge in ABS agreements, some initial obstacles appear, including how to identify a community of knowledge holders. According to Benni, the approach initiated by the National Biodiversity Act of 'community-based access', though not perfect due to the difficulties in defining community, is currently the best way to apply ABS in South Africa. What exactly a community is, however, is still only vaguely defined in the act[4]. When a community is finally detected or defines itself as being a knowledge holder – as, for instance, the Masakhane community in the *Pelargonium sidoides* case – another question arises, namely with whom in the community the benefits should be shared? Furthermore, what sort of benefits should be shared, and under what circumstances? Politically, such issues are only vaguely defined. Should communities always claim financial benefits? The Biodiversity Act proposes monetary, non-monetary and 'in kind' benefits[5]. Benni

4 In the National Biodiversity Act, 'indigenous community' is defined as "any community of people living or having rights or interests in a distinct geographical area within the Republic of South Africa with leadership structures (…)" (NEMBA 2004: 9): www.environment.gov.za/sites/default/files/legislations/nemba_regulations_g30739rg8831gon138.pdf.

5 According to the National Biodiversity Act (2004), Annex 8, non-monetary, monetary and 'in kind' benefits may include: sharing research results; conservation support; species inventories; student training and support; scientific capacity and development; technology transfers; joint research; information, equipment and infrastructure; access to international collections by South Africans; community development projects; and environmental education (to name but a few) (NEMBA 2004: 59–66): www.environment.gov.za/sites/default/files/legislations/nemba_regulations_g30739rg8831gon138.pdf.

deemed non-monetary benefits (in the form of building schools or hospitals) most appropriate.

In actual ABS negotiations such as the *Hoodia* case, this remains a contested realm. Some communities prefer monetary benefits while others also realize that money is difficult to deal with (among others, some local communities lack the infrastructure to deal with large amounts of money). Communities are, furthermore, oftentimes insufficiently prepared to engage in ABS negotiations, particularly since they are habitually held using highly technical legal language. Also, impoverished communities with low levels of education are commonly unprepared to communally manage a large injection of cash. The unexpected prosperity may end in conflicts and corruption, as Roger Chennels, the lawyer who worked with the San Council on the ABS agreement between them and the Council for Scientific and Industrial Research (CSIR), commented in an article on 'Sharing Benefits Fairly: Decision-Making and Governance' (Wynberg et al. 2009: 231ff.):

> I got buy-in from the San Council (…) but I think it would be fair to say that they were completely in the dark about what was right and what was wrong with regards to intellectual property, so at that stage I had a stronger role than I had [with] modern (sic.) clients, whose leaders are fully aware of everything (…) I am intensely conscious of the fact that a lawyer can easily say that my client has decided when you actually forced them to make that decision (Roger Chennels, Upington 2006, in Wynberg et al. 2009: 240).

Representatives of the San Council commented in a similar tone: "We were sitting there and [had to] rely mostly on our lawyer as we had no knowledge" (ibid.). Indeed, a core issue is that in ABS negotiations, local communities can hardly lead or engage in them without the support of a lawyer or legal institution knowledgeable in this matter. This naturally creates a form of dependency. These lawyers or legal institutions are, in turn, dependent on the demands of the negotiating party. Again Chennels:

> If I could have built up better NGO links and better funding arrangements and all of that it would have been made easier (…) we did not consult enough, we didn't have enough time to talk (…) because it was all was done in a rush. I was forced into a Western system that required very quick answers for the stakeholders – Pfizer [a large pharmaceutical multinational interested in developing and marketing Hoodia] not prepared to go ahead until there was clarity. So, if this thing was going to be a success for us, we had to reach an agreement quite soon. Yet (…) there was this whole world of people who had not had the opportunity to understand this collective thing. So more time and more support would have been good (ibid.: 242).

Whether benefits are monetary or non-monetary was, for Mr. Sechaba, whom I interviewed in Pretoria in February 2009, less relevant. He was more concerned with the also prompting question of how benefits may be shared with a community, especially when a community spreads across national borders. He added a concern that he had about the government's approach to ABS.

> *BR:* Hmm, and how is the government working with these issues?
>
> *MS:* I think the way that the government is going about [it] is the Biodiversity Act (...). But if things grow [and] cross borders [i.e. when the knowledge holders are not bound to a single nation state], whose consent is needed? So, those are the issues that I think need to be addressed and you need benefit sharing arrangements with the communities. But what is a community? You cannot identify the communities, so the solution that the government then provides is to set up a national trust. You need a permit basically under the Biodiversity Act to do research [that leads to] commercialization' research commercialization. So in that way you will be able to control it in terms of biopiracy. But you will not be able to stem it entirely, because people cross borders, they visit traditional healers, the traditional healers can give them a cure, whatever it is.
>
> *BS:* Is the benefit sharing agreement always negotiated with communities?
>
> *MS:* Ya, it is stemmed with communities, because traditional knowledge, unlike intellectual property, in the traditional sense is not the property of one person.

With the CBD, sovereignty over biodiversity was handed over to nation states, and it offers no politically manifested rules on how to deal with cross-borders issues. In the *Hoodia* case, the problem was that the San could not be framed as *one* community, but rather as an ethnic group consisting of different communities spreading across South Africa, Angola, Namibia and Botswana (Vermeylen 2009). To make the issue of communities more complicated, a community – or what is defined as a community – will often have a complex, hierarchical structure, with chiefs, subchiefs and community councils, as well as other authorities such as church members and other citizens with strong, authoritative voices. Internal conflicts, such as those between the chief and traditional healers, may, for instance, cause differences about the distribution of funds, in the event that such funds ever reach the community.

Obviously, ABS, though a well-meant initiative to appropriately share benefits, is not easy to apply in practice. The problems begin with the application process for bioprospecting, which, with the commencement of the Biodiversity Act, became administratively strenuous and politically thorny. The challenges that come with ABS reach into all corners of bioprospecting, as the remainder of the chapter will show. In most cases, the exchange of knowledge hardly ever reaches the point of an ABS agreement. PIC and an NDA may be negotiated, but the negotiations

will hardly ever go further. Given such a low success rate and lack of certainty, is ABS even really worth consideration as a tool for local and national development? Examples of stakeholders and institutions grappling with ABS will show, that the answers are as ambivalent as the field of ABS, where hope interchanges with disillusion. I will start with describing the challenges coming with ABS in the scientific realm.

Science in Distress: Navigating Spurious Inventions

In 2009, bioprospecting legislation in South Africa posed severe difficulties for scientific institutions during the discovery phase, particularly with regard to ABS[6]. The problem was not the sharing of benefits alone, but the protection of scientific knowledge and research results that comprise indigenous knowledge. Although research and development activities are taxing with regard to time and money, and thus require appropriate protection via intellectual property law (in the form of patents), when indigenous knowledge is involved in scientific inventions it too cannot be ignored, and intellectual property law and patents are insufficient in this regard. This poses a fundamental question about how to identify the knowledge that should be protected with regard to scientific inventions, and how. Again Nchinya Bapela (Benni, NB) at the IKS Laboratory illustrated for me the implications of these challenges:

> *NB:* (…) you're doing research on this and you patent the stuff. So if you patent it, you patent the stuff you want to do further research on and you don't want other people to know what you are doing. Once you publish, it is for public consumption. And anybody who comes across will say, I can do this for this and this and this and they will beat you [to it]. This is one of the reasons why the IKS is not publishing. This work is not meant for publication. Pharmaceutical companies also don't publish their work. You don't go to journals and find their publications, unless it's been done by an accreditation institution. (…)
>
> *BR:* So, do you think the protection of [indigenous] knowledge is necessary?
>
> *NB:* I think intellectual property should be protected. If you go to, say, to a German company and they make weapons and they (…) want to be the sole suppliers [of those weapons] and protect the knowledge, or [a] KFC recipe, because that knowledge gives them money to survive. Now, if our knowledge makes other

6 In a follow-up conversation in March 2012, Dr. Matsabisa told me that the law had changed and that basic research institutions no longer not had to get involved in ABS. According to the new law, only those institutions and companies that deal with the commoditization of the product have to engage in ABS agreements.

> people rich and we keep staying poor, that's useless. That's why we need to protect [knowledge holders]. (…) Personally, I think it is more important to protect the knowledge holders. So for me, doing that type of work [scientific analysis of medicinal plants], I am not really the knowledge holder. I mean, I get paid. Those people who provide the knowledge, they don't get paid. I can live a better life than the person who gave me that knowledge.

Benni asserted that intellectual property should be protected. He did stress that scientific inventions also require protection, but according to him, it should be less the scientific knowledge and more the knowledge holders that should be protected. This is also because the knowledge holder(s), in case he/she or they are of indigenous origin, are generally (financially) disadvantaged.

Sharing and Protecting 'Property' at the Medical Research Council

The Innovation Center (IC) is a special unit at the MRC established to process MRC patent applications. The IC has the assignment to "drive innovation opportunities emanating from MRC research discovery so as to commercialize and implement sustainable health technologies for the benefits of the MRC, the inventors and society in general". It is responsible for the identification of research with commercial potential and/or social value, for providing assistance and advice to MRC researchers on various intellectual property related issues, for the marketing and licensing of intellectual property, and for developing and implementing policies, procedures and systems for effective intellectual property management and technology transfer. In an interview with Michelle Mulder, manager of intellectual property and business development at the IC in August 2009, she briefly summarized the core challenges of IPR provision and in particular addressed issues regarding the interface between traditional knowledge and intellectual property:

> Look, combining the two worlds of traditional knowledge, including cosmologies, spirituality, on the one hand, and science, and its very own construction of reality, on the other hand, is a very difficult task. The challenge is to meet the different needs of all stakeholders in legal policies and regulations. At least one of the involved parties might always feel neglected. (…) Also, the process of intellectual property rights and benefit sharing in bioprospecting is still very young. Things still have to be balanced out. The whole process basically only started in mid-2000. One has to consider that plant analysis and extraction of active pharmaceutical substances is a highly cost-intense and time-consuming process. It can take years to really find a valuable component and the investments often remain without any output and success. The question [of] how to share benefits arising from this long-lasting process ends in the unresolved questions: what, in a 'fair' benefit sharing [agreement], is fair, and what isn't?

Dr. Matsabisa underpinned Mulder's argument during a conversation we had at the IKS Lead Program in August 2009. He explained, "There is no comprehensive intellectual property regulation with regard to indigenous knowledge. Also, so far, we have no fully developed access and benefit sharing case in South Africa, apart from the *Hoodia* case." Research at the IKS Laboratory was at that time still in its infancy and was at not at the point of filing a patent[7]. However, at the time of our conversation, he was nevertheless curious about the question of how to appropriately share the benefits of upcoming research results.

He presented an interesting case to me. A *muthi* mixture that was under investigation at the IKS Laboratory consisted of a combination of four plants derived from different parts of South Africa. The knowledge holder who shared the mixture with the IKS Lead Program originally came from Kenya, but had been living in South Africa for 10 years, until his death in 2006. He did not have any known heirs nor could a community be located where the knowledge of the plant mixture had initially come from. Against this background, Dr. Matsabisa asked, how and with whom should the benefits that may accrue from this plant mixture be shared? Dr. Matsabisa asked me to think about the problem and offer a solution in the form of a PowerPoint presentation in a few days' time. His request astounded me. I could hardly follow the complexity of the stakeholders and interests that he was presenting in the illustration, and I am not a lawyer concerned with intellectual property law and ABS agreements. From what I understood I was not at all qualified to present 'solutions' for how to determine a fair and appropriate benefit sharing agreement for a complicated problem that an entire unit at the MRC was engaged with. What his request did demonstrate to me though was that ABS poses a significant problem for scientific institutions that only do basic research.

I assumed that the case Dr. Matsabisa presented to me was for PHELA, the plant mixture on which Brian Sehume was conducting research. Perhaps further research would lead to the finding that PHELA contained viable antimalarial properties. But this remained an assumption on my part; Dr. Matsabisa maintained the rules of anonymization and did not reveal the names of the plants about which the illustration spoke. According to the illustration the plants came from different parts of South Africa (North Western and Limpopo Province), and beyond (Swaziland and Lesotho). The illustration roughly illustrated the estimated distributed percentages of the benefits deriving from the production of a 4mg capsule of the

7 A patent on *Dicoma anomala* was filled in 12 countries 2005 on the "Treatment of parasitic Infections in humans and animals" by Dr. Matsabisa, William Ernst Campell, Peter Ian Folb and Peter John Smith (all Cape Town), see: http://patents.justia.com/inventor/motlalepula-gilbert-matsabisa. The research on *Dicoma anomala* was continued and released a patent claim for *Dicoma anomala* as a novel therapeutic against malaria: http://innovation.mrc.ac.za/malaria.pdf (last accessed February 12, 2016).

plant mixture. Fifty percent of the profits should go to the communities and 50% to the MRC. The 50% meant for the community would be allocated and redistributed by a national trust fund. Commonly, 5–10% of this money ought to go to the knowledge provider, usually the community of a knowledge provider. Of the 50% set for the MRC, one-third should go to the investor who paid for the research and development, one-third to the MRC and one-third to the IKS Lead Program. As was explained before, when a mixture consists of four plants from different regions of South Africa, or from other African or non-African countries, the question of how to share the benefits becomes complicated, in particular when the focus of the South African government so far is on sharing with a community. Benefit sharing with a community is only possible when ownership is clearly defined, which was not the case in the illustration.

The illustration exemplifies why ABS so rarely turns out to be an applicable solution. Firstly, the distribution of benefits is, politically speaking, still not clearly defined. The illustration offered a vague summary of possible distributive measures, not a thought through solution. Secondly, the many stakeholders involved make distribution very convoluted. When distribution is so complex, the likelihood of some stakeholders being unsatisfied is very high. A simplified approach like a national trust fund may offer a better way of distributing funds. Thirdly, at no point did the illustration take into consideration the value of inalienable possessions; that is, the cultural and social value of the intellectual property. It was purely interested in the distribution of financial revenue. This, however, posed a key problem. The original knowledge holder had died and a community was not detectable. The plants, furthermore, had no clearly definable place of origin. Hence all of the measures proposed by the National Biodiversity Act to ensure an appropriate ABS agreement were inapplicable. Dr. Matsabisa never came back to me to ask for the PowerPoint presentation offering my proposed solutions. And indeed, I actually could not see any solution for the complex case for which, even on a political level, there seemed to be no sufficient answers.

Databases: A Possible Solution?

One possible solution to protect knowledge, and that has been applied in many countries, is to set up medicinal plant databases (Gupta 2005; Reddy 2006). Databases might be a useful tool since when ABS agreements are negotiated, the origin of the discussed knowledge must be provable. As the above illustration showed, proof is not always easy, especially when knowledge is largely undocumented and only orally transferred, as it is in many African countries. If the knowledge was documented in a database, this would constitute a useful resource

for those attempting to set up an ABS agreement[8]. National patent offices could scan these databases for already existing or new knowledge.

According to Reddy (2006), databases in this context involve the process of "writing, codifying, translating, or digitizing a tradition (and the making of cultural objects)" (Reddy 2006: 163; see also 2008; Bowker & Star 2000, Foucault 2002 [1966]). In China and India, databases such as the Indian Traditional Knowledge Digital Library (TKDL) have a long tradition, also because of the fact that plant-related knowledge has been documented over centuries (Reddy 2006: 162ff.). Ownership can, in this instance, be more easily defined. Much hope and work is put into such documentation projects, which are also aimed at ensuring security of the knowledge. It is, however, not always an uncontroversial undertaking. Questions such as "What kind of data is fed into databases and what is cut out?" or "How far do indigenous people have rights over the knowledge once it is fed into a database?" are pertinent. Mr. Sechaba also critically reflected on the idea of knowledge protection in databases:

> *BR:* But, ya, there must be a means of protection in the globalized world.
>
> *MS:* Ya, but you see, that would be partly protected by the Biodiversity Act because it is plant material that leaves the country, so therefore they need an export license or permit. But then in terms of the mixtures, that's where the Indians talk about databases. They put together databases. South Africa is talking about databases as well.
>
> *BR:* Ya, they started a database project already.
>
> *MS:* But databases do not provide protection. They say they provide protection against biopiracy, because then those databases are made available to the patent offices round the world and when they do novel research they can be able to follow up on these things and they say 'No, you cannot get a patent for this because it is already in databases'.

In South Africa, the idea to attempt to protect knowledge via databases was realized with the Traditional Medicine Database (TRAMED), started in 1994. The University of Cape Town's Traditional Medicines Research Program in the Department of Pharmacology and the University of the Western Cape implemented the database. To this day, TRAMED aims to assemble and archive traditional medicinal plants and indigenous knowledge to ensure their long-term accessibility to the public – for scientific research, the pharmaceutical industry and traditional healers – without being confronted with claims of biopiracy. It is also intended to serve as a measure against decreasing biological resources and the loss of indigenous knowledge.

8 The lack of documented or written knowledge in turn poses a challenge, however, for those attempting to set up such a database.

TRAMED was also designed with the plan to include the knowledge of traditional healers, making them equal partners in contributing to the database. At the beginning, traditional healers were invited to share and publish their knowledge in support of TRAMED, enticing them with promises of shared benefits in the event that bioprospecting would lead to successful developments. The cooperation resulted in the publication of the 'Traditional Healers' Primary Care Book' (Felhaber 1997; see Flint 2012: 260). For most contributing healers, however, the knowledge they offered that was fed into TRAMED remained unrewarded, as one of the participating healers, Philip Kubukeli, resentfully told me during an interview in Cape Town in February 2010. The ownership of the knowledge also basically rests in the database itself and those who organize it, not in the healers, even though the knowledge belongs to the healers. This has led to frictions between contributing healers and scientists, and ended in the refusal of some healers to further contribute to the database (Flint 2012).

In this context, TRAMED has been criticized by the US-based group 'People's Health Alliance Rejecting Medical Authoritarianism, Prejudice And Conspiratorial Tyranny' (PHARMAPACT) for illegitimately disclosing local knowledge. The group disseminated the concern about a traditional medicine sell-out (Reihling 2008: 5) by publishing a long letter in 1999 to Dr. Isaac Mayeng, who was the Senior Medicines Control Officer at the Medicines Control Council of the Department of Health at the time. The letter began: "Say NO! To the Tyranny of Monopolistic PHARMACEUTICAL EXPLOITATION of Natural Health Substances"[9]. It was an outcry against biopiracy and the illegitimate use of databases without the appropriate integration of knowledge holders. The Nyanga Traditional Healers Organization for Africa also openly expressed their discomfort over TRAMED. On their webpage they claim "scientific institutions, such as the University of Cape Town's TRAMED project seek access to traditional medicine knowledge for the primary purpose of developing profitable products"[10]. They announced their position in an article on their website entitled 'Biodiversity and Intellectual Property Rights – Implications for Indigenous People of South Africa':

> (…) once indigenous peoples share traditional health information or plant material they effectively lose control over those resources, regardless of whether or not they are compensated. If formulas using traditional medicine knowledge are eventually patented, access to these cost effective and freely available materials can be legally restricted by monopoly patents and registrations by means of registering health claim benefits. The current South African Medicines, and Medical

9 www.gaiaresearch.co.za/pharmapact/Mayeng%20Dec%2099.pdf (last accessed October 20, 2014).

10 www.traditionalhealth.org.za/t/documents/biodiversity_and_intellectual_property_rights_02.html (last accessed January 25, 2016).

> Devices Act (SAMMDRA) and it's (sic.) regulations will empower the bio-pirates (sic.) and not the people, as the healers have not got the technical or financial resources to enter the playing field of traditional medicine production which should be their right. No matter what the circumstances, indigenous communities must have the right to say "no" to bio-pirates and legitimate bio-prospectors (…) Many healers are now joining in a new struggle to preserve their cultural integrity and are actively canvassing for support in holting (sic.) the expropriation of natural health substances by the pharmaceutical industry, the Medicine Control Authority, TRAMED, and the WHO[11].

With 29,000 members, the Nyanga Traditional Healers Organization for Africa is one of the largest in the country, and they are probably the most influential healers' association in South Africa. Dr. Maseko, former CEO of the organization, and his daughter Phepsile Maseko, now the National Coordinator, are strong public voices fighting for the rights of traditional healers in South Africa. The organization targeted Dr. Mayeng in particular, accusing him of being actively involved in traditional medicine research at TRAMED without adequately informing and supporting traditional healers. Dr. Mayeng, who in 2009 had become director of the Traditional Medicine Unit at the Department of Health, is trained as both a traditional healer and a pharmacologist. He previously worked at the Department of Pharmacology at the University of Cape Town and was, among others, co-responsible for the initiation of TRAMED. On their website, the Nyanga Traditional Healers Organization for Africa write:

> Dr. Mayeng is known by our organization as a "biopirate", because he has been actively involved in traditional medicine research at the University of Cape Town's Traditional Medicines Research Project (TRAMED). This specialized research department have (sic.) been actively screening our regions (sic.) traditional plants for potential drug development, under the auspices of anti-malarial research[12].

This was the second time that I encountered serious accusations made against Dr. Mayeng by traditional healers. When I interviewed him in his office at the Department of Health in Pretoria in 2009, however, he seemed very considerate and concerned about his profession, traditional healing, and about the protection of medicinal plants and indigenous knowledge. During the interview, which was short and felt that it remained somewhat superficial, Dr. Mayeng assured me: "Look, I am a healer myself and I believe in the power of traditional healing. I do everything within my power as the director of the National Department of Health to support

11 www.traditionalhealth.org.za/t/documents/biodiversity_and_intellectual_property_rights_02.html (last accessed July 14, 2014).

12 See: www.traditionalhealth.org.za/t/documents/biodiversity_and_intellectual_property_rights_02.html (last accessed July 14, 2014).

traditional healers and their needs" (from interview, Pretoria, October 2009). Despite this, it would appear that his peers view him more as a politician and scientist who "is working on both sides".

Databases like TRAMED, or the knowledge documentation project initiated by the World Intellectual Property Organization (WIPO 2012)[13], comprise certain aspects of traditional knowledge, but leave out most of the ontological, spiritual and socio-cultural background to the knowledge. WIPO tries to overcome this by adding visual material such as video, photo and audio documentation like narratives, stories and descriptions to the documentation process.[14] The objective and benefit of the NRS is, according to the CSIR, to create opportunities "for benefits to flow back to the communities," in the form of community recognition, sustainable livelihoods, economic value and improved quality of life.

The crux of indigenous knowledge protection remains that knowledge that is collectively held, is embedded in a socio-cultural and spiritual context, and is continuously changing. Databases can only fix a very particular part of this knowledge and has to leave out most others. Therefore, I suggest, and in agreement with Mr. Sechaba, that indigenous knowledge protection requires not one but multiple means of protection. Instead of abolishing the idea of databases, other measures of protection should be added, in particular those that deal with the socio-cultural value of indigenous knowledge. Databases are a defensive protection tool that enables scientists to scan already existing data, partly in order to check whether the knowledge has already been patented or not. These defensive measures of protection then have to be complimented by proactive measures of knowledge protection, one being ABS agreements, where the specific knowledge of knowledge holders is legally protected. The example of TRAMED and the 'Traditional Healers' Primary Care Book' showed, however, that while this is an interesting approach on paper, it is rather controversial in reality. According to Phepsile Maseko and the Nyanga Traditional Healers Organization for Africa, PHARMAPACT and others, the promised benefits never materialized.

This was at least the case at the beginning of the 2000s. In the year 2009, however, it seemed that the situation had progressed. The ABS workshop that I attended in Cape Town, which I will describe in the next section, and other similar workshops and conferences – such as a workshop on the Traditional Knowledge Commons in Cape Town in March 2012 (see chapter VII) and the Third Global

13 See: World Intellectual Property Organization (2012): The World Intellectual Property Organization Traditional Knowledge Documentation Toolkit (www.wipo.int/export/sites/www/tk/en/resources/pdf/tk_toolkit_draft.pdf).

14 With the 'National Recordal System' (NRS) launched in 2013, South Africa is trying to put this documentation scheme into practice.

Congress on Intellectual Property and the Public Interest and Open A.I.R. Conference on Innovation and IP in Africa in Cape Town in December 2013, to name but a few – demonstrate the global and national relevance of the subject and the hope for development, that comes with ABS. The next section will look at the ABS workshop in particular, also to show that ABS does have relevance with regard to the proposal of ABS being an issue of national and local development.

ABS – Three Letters for Development?

Coming back to the question whether ABS does have an impact factor for development, the answer must provisionally be yes, at least when looking at the efforts put into the development of ABS. Knowledge protection and benefit sharing has become a significant 'market of hope' (Rutert 2010) promoted by several large global networks. One such network is the ABS Capacity Development Initiative, begun in 2006 and managed by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ, now Deutsche Gesellschaft für International Zusammenarbeit, GIZ), which has as its core focus on the question of "how to harness and make use of the moment of knowledge disclosure and ABS for local development and poverty alleviation"[15]. In this context, innovation in Africa is regarded as a central part of pushing development forward. How to protect these innovations and how to share the benefits that may arise from these innovations is crucial in this context.

An online report from 2010, under the headline "Southern Africa: Region Failing to Innovate, Says Study,"[16] cited a study conducted by the United Nations Educational, Scientific and Cultural Organization (UNESCO) that concluded that "Countries in southern Africa are producing so few scientific publications and patents that [the] region's social and economic progress is threatened" (Campell 2010, citing UNESCO 2010, cited in de Beer et al. 2014: 6). Scientific publications and patents are generally taken as a sign of innovation and development. The more patents a country owns, the more innovative and developed it is seen to be. But is it really as simple as this? The huge, economically strong companies of the Global North hold most of the patents worldwide because they can afford the expensive production and patenting procedures (cf. Robinson 2010; Shiva 1997, 2007). In addition, innovation is not measurable by patents alone, as if a patent was an innovation currency, but rather by the mere fact that something new has been developed – a process that often happens not in laboratories but 'on the ground'. And this in-

15 See: www.abs-initiative.info.

16 "Southern Africa failing to innovate, says study", August 13, 2010 (www.scidev.net/global/policy/news/southern-africa-failing-to-innovate-says-study-1.html).

novation on the ground was realized as having huge potential as a means of local development, when properly harnessed.

An ABS Training Course in Cape Town

The challenges and potentials of ABS, and its importance as a developmental tool for the African continent, were intensively discussed during an ABS training course entitled 'Training Course in Access and Benefit Sharing from Genetic Resources and Associated Traditional Knowledge' that I attended on January 24–29, 2010 at the stylish Breakwater Lodge Waterfront in Cape Town. The foreword of the Course Manual and Resource Book made the following proposition: "ABS – THREE LETTERS FOR DEVELOPMENT." This was both directive and assertive; setting a clear imperative for the idea that ABS will benefit national and local development. The GTZ ABS Capacity Development Initiative and the Environmental Evaluation Unit of the University of Cape Town hosted the workshop. The participants were primarily from the African continent, with the exception of myself and a researcher from the Northern Research Institute in Norway, who came together to discuss the current legal and political situation of ABS and (indigenous) knowledge protection. In total, 37 delegates from southern and eastern African governments, NGOs and the private sector – including the South African Department of Environmental Affairs and Tourism (DEAT), the Namibian Ministry of Environment & Tourism, the Tanzanian Commission of Science and Technology, and the Southern Alliance for Indigenous Resources in Zimbabwe – were present to learn about ABS and take the message back home to their countries[17]. The overall aim was not only to discuss local challenges but also to put larger developmental goals into perspective and thus contribute to a greater balance of justice between North and South. The ABS Capacity Development Initiative's website describes the potential of the CBD and ABS as having been 'carved in stone' with the adoption of the Nagoya Protocol:

> This international agreement is without doubt a major milestone in the efforts to ensure justice in the protection and sustainable use of biological and genetic resources worldwide. It is also well integrated into the global context of sustainable development: reaching the Millennium Development Goals (MDGs), ensuring food security, supporting the emergence of a Green Economy and establishing North-South Justice[18] (cf. Maister et al. 2012).

The overall consensus of the training workshop was that Africa, against common images of it being underdeveloped, poverty stricken and war torn, has a lot of cre-

17 The ABS training course was also offered in Ghana for western African countries and Cairo for northern African countries.

18 www.abs-initiative.info/abs-simply-explained/ (last accessed February 15, 2019).

ativity and innovation to offer, which only has to be properly valuated and harnessed. The workshop was thus constructed as an awareness-raising event to introduce the stakeholders to the concepts and principles, challenges and opportunities, of ABS. The four days were packed with presentations on international and national ABS regimes and policy frameworks in specific African countries, the legal specificities of ABS, the role of indigenous knowledge for ABS and its legal and customary protection schemes, and finally the ABS negotiation process. Experts working in the field gave various presentations, including Kabir Bavikatte from the NGO Natural Justice, who presented biocultural community protocols (BCPs); Roger Chennels, a lawyer who presented the ABS negotiations pertaining to the *Hoodia* case; and the IKS Lead Program Director Dr. Matsabisa, who introduced the IKS Lead Program. Scholars working in the field of bioprospecting also gave presentations. Finally, representatives of communities who had been involved in ABS negotiations were invited to present their experiences; in this case, a representative of the Masakhane community in Alice in the Eastern Cape spoke on their successful challenge to the patenting of *Pelargonium sidoides*.

The atmosphere among the participants was intellectually stimulating and fact oriented. The workshop was concerned with teaching the participants about ABS, content that they had not known previously or only to a limited degree. ABS legislation was, in most African countries, still in its infancy (in South Africa, it had only existed since 2004) and had not yet been fully incorporated into national application schemes. Controversial opinions were, generally speaking, not discussed as conflictive but as explanatory. Only Phepsile Maseko, the strong-minded and straightforward National Coordinator of the Nyanga Traditional Healers Organization for Africa, announced her discomfort with regard to the cooperation between science and traditional healers, as well as the restrictions that the National Biodiversity Act places on traditional healers with regard to accessing their natural plant collection grounds[19]. Maseko also raised the controversial issue that traditional healers were, due to the National Biodiversity Act, being restricted from performing traditional healing in the "traditional way", i.e. because they are prevented from collecting medicinal plants in nature reserves or other fenced-up areas. She vehemently proposed the right of healers to participate in nature conservation as well as in science. Later, after Dr. Matsabisa's presentation, Maseko assertively held that "Traditional healers' associations are not integrated in research and development of medicinal plant products and the inclusion of knowledge into databases." Dr. Matsabisa in return announced: "It is true that the MRC has been negligent towards traditional healers in the past. That may have been for the fact that the

19 An example of this arose during my fieldwork when I visited a *thwasa* (trainee healer) in Mboyti in 2009. He said that healers were no longer allowed to collect plants in the nearby forest because nature conservation efforts had restricted access (from interview, Mboyti, October 2009).

structures of healers' organizations are not transparent enough. This lack of transparency makes it virtually impossible to approach the relevant healers". Over lunch, Maseko told me "Science does not care about us healers. They only want the knowledge to extend their research and find new products." This short argument between Phepsile Maseko and Dr. Matsabisa illustrates the link between the (lack of) inclusion of knowledge holders and the production of knowledge in bioprospecting, and the fact that inclusion is not automatically applied in the way it is politically claimed. What is missing is a regular monitoring system to control the application of ABS.

These issues were brought up again the following day, when the whole delegation visited the IKS Laboratory in Delft, where traditional healers and scientists presented themselves and their cooperation at the laboratory. The reflections of the workshop participants on this meeting expressed how they had perceived the position of traditional healers at the IKS Lead Program. One participant said, "I could not really see why traditional healers were at the laboratory, besides looking nice and representative." Another participant claimed, "The group of scientists looked as if they don't acknowledge the role of traditional knowledge. From what they said, I could see a bit of dishonesty. It made me feel there is a lot of mistrust among the people." A third voice was annoyed: "You see, when the government puts these policies into place but does not monitor them, they are useless. And also, the MRC is not explicit on how much to share with the traditional healers and how much the company receives, so there is a continuous exploitation of knowledge." ABS was generally perceived as being only superficially monitored, and this was synthesized as one of the main problems facing its successful implementation.

The training course ended with a book presentation of 'Indigenous Peoples, Consent and Benefit Sharing' (Wynberg et al. 2009) at the Kirstenbosch Botanical Garden, and the presentation of the Masakhane community representative who discussed the history of the *Pelargonium sidoides* case. Moreover, Uli Feiter, the director of the medicinal plants and pharmaceutical company Parceval, presented his perspective on ABS, which was a bit more provocative. He asserted, "ABS is a highly emotional subject, which at times gets out of hand." He also complained:

> It is often repeated that huge pharmaceutical drug giants [are] exploiting rural African communities, which in fact is not the reality, but rather an emotionally charged narrative. It takes lots of effort to take the emotions out of the debate. In the end, the field of medicinal plants is a business.

He then continued:

> The problem remains the definition of community. I chose to closely cooperate with a community in the Eastern Cape, which approached me to start a business on Pelargonium. We signed an ABS agreement with the community and they

installed a trust to share benefits. The process is still pending, especially because the ministry (of Water and Environmental Affairs) is slow in approving the papers.

Both, the reactions to the visit at the IKS Laboratory and Uli Feiter's approach to dealing with the 'emotionally charged' field of ABS reveal how contentious and uncertain the field still is. Training courses introduce people to the complexities of the ABS landscape and to its contradictory and emotionally charged application. This contextualization helps stakeholders to implement policies in their own countries, especially those where ABS has not yet been (adequately) implemented. Courses such as the one I attended would not be offered without the belief that ABS holds opportunities for local and national development. The course was surely also meant to close the gap between the ABS rhetoric and the realities on the ground. But still, in 2009 obstacles and challenges pave the way towards fair and equitable benefit sharing, with most of the challenges deriving from restrictive ABS legislation and its application, as the next section – which gives voice to traders working with medicinal plants, and a *Hoodia* Task Force Group meeting, in particular regarding their problems in applying ABS – will show.

People and Plants in Action

South African commercial plant traders are bioprospectors, and as such they are affected by bioprospecting legislation. They cultivate medicinal plants in order to manufacture them in their own factories and/or to supply bigger companies overseas. The medicinal plants and pharmaceutical company Parceval, for instance, situated in Wellington in the Western Cape, cultivates *Pelargonium sidoides* in the Eastern Cape, which it then either manufactures in Wellington or delivers to the German company Schwabe in Germany. This commercial business differs from that of petty traders and so-called '*muthi* hunters' in terms of the size of the business, and very often skin color. All of the commercial plant traders whom I spoke to were white businessmen, while *muthi* hunters are mostly black and engage in the illegal collection of the barks, roots and leaves of medicinal plants to supply the big *muthi* markets in Johannesburg and Durban. The National Biodiversity Act mandates that bioprospecting activities must be permitted by the Department of Environmental Affairs (DEA)[20] and that the bioprospecting rules and regulations have to be main-

20 See NEMBA Chapter 6, Section 81(1): "A person may not without a permit engage in commercialization phase of bioprospecting involving IBRs [indigenous biological resources] or export IBRs for bioprospecting or any other kind of research"; and Section 81A: "No person may without first notifying the Minister engage in discovery phase bioprospecting involving any IBR; and a person involved in the discovery phase of bioprospecting must sign a commitment to comply with the requirements of the commercialisation phase of bioprospecting", see: Malherbe C.

tained at all times[21]. Not upholding these rules is punished by five years' imprisonment (ten years for second offences) and/or a fine not exceeding 5 Million Rand (10 Million Rand for second offences) (Section 98(2) of NEMBA 2004). The benefits may be shared either monetarily or non-monetarily, e.g. providing support to build schools, hospitals or other infrastructure, as well as promoting employment and business opportunities, depending on the parties' agreement. Politically, this sounds like a reasonable approach to bioprospecting. Practically, it unleashes a number of new challenges.

"It's an Awful Lot of Work": Trading Under the ABS Legislation

One of the traders I spoke to was Uli Feiter, the CEO of Parceval. Uli, a trained gardener from Germany, came to South Africa in the 1980s and established the small-scale company as a manufacturer of herbal, homeopathic and natural medicines in 1992. Over many years, Uli taught himself about South African medicinal plants. His company grew larger and eventually became one of the most successful medicinal plant manufacturing companies in South Africa. In an interview that I conducted with him in August 2009 in his office in Wellington, he expressed his concerns about the current South African ABS legislation, as well as his own thoughts on how to survive in this competitive market, which had become more problematic since the promulgation of the CBD and the National Biodiversity Act:

> *BR:* What roles do international organizations and regulations, such as the CBD und the Biodiversity Act, play for you? What position does the commercial sector represent here?
>
> *UF:* Since the CBD was introduced, working with indigenous medicinal plants became much more difficult. One permanently has to take care of regulations and political requirements. Filling out paperwork and signing lots of documents. It is an awful lot of work. I did try to oppose these regulations, in meetings and workshops, but nobody listened.
>
> *BR:* And how should a functioning access and benefit sharing agreement look?
>
> *UF:* The problem is that [indigenous] people think that they have a true treasure chest into which they only have to grab and immediately there is big business. Of course they want to be part of the business made with medicinal plants. However, they do not consider the high costs it takes to produce a commercially

(2011): Bioprospecting, Access & Benefit Sharing in South Africa, Marrakech (www.abs-initiative.info/uploads/media/Marrakech_01-2011_Malherbe.pdf).

21 www.abs-initiative.info/fileadmin/media/Knowledge_Center/Pulications/ABS_Dialogue_042014/National_study_on_ABS_implementation_in_South_Africa_20140716.pdf (last accessed January 10, 2016).

> valuable product: time, knowledge and knowhow, materials, money. A safety study could easily cost 50,000 Euros. And even then, no benefits are made. It can take several million Euros for a product to really be on the market. Who can pay that, besides Merck or Pfizer? And finally, who can deal with the administration of these products, particularly the complicated administration demanded by the government? Only the big companies will be able to financially maintain the administrative process. My solution would be to think smaller, to find a niche. Why must we always strive to achieve the best and the most? Everyone believes in finding a cure for HIV/AIDS or cancer, particularly for products that are interesting for the European market. I think it is much more useful to find products for the African market, e.g. something that helps to sooth edema, a classic side condition of HIV/AIDS. Why not find an affordable cream for the market here? I think small traders like us can help to loosen up the monopolization of the big companies (Wellington, August 2009).

The requirements of NEMBA and BABS include not only tedious negotiation processes with the respective communities, but also lots of administrative paperwork with the Department of Agriculture and Environmental Affairs. Often, applications remain for a long time on the desk of the administrator or minister who has to approve and sign all bioprospecting applications. This procedure is laborious and keeps small companies away from bioprospecting activities due to a lack of time and/or human and financial resources, a fact that is mostly unknown by the providers of knowledge. For them, their own ideas about benefit sharing, evoked by ABS politics, stand in the foreground. Uli, understandably angry, claimed that the new ABS legislation evokes ideas in indigenous people of simply being able to grab into their "treasure chest" of medicinal plants to release "gold" or "green diamonds" (Wynberg & Chennels 2009). As a plant trader with commercial interests, Uli knows about the challenges that the medicinal plant trade ultimately faces: costs, time and huge competition on the market, especially from the larger 'Big Pharma' companies such as Pfizer. His solution for a small company like Parceval rests in finding a niche, like the production of an affordable cream for the treatment of side effects of HIV/AIDS. Such a medication is probably not as profitable as the 'green diamonds' to treat the world's major diseases, but it would still help people in need.

> We have a sort of benefit sharing agreement with the community in the Eastern Cape, where we currently run a Pelargonium plantation site. But I am neither a development worker nor a social worker. I am a gardener and a businessman. So again, the CBD made everything much more complicated for us (Wellington, August 2009).

Pelargonium sidoides (Geraniceae) is a medicinal plant native to South Africa. It has heart-shaped velvety leaves and a deep purple flower. The medicinally valuable parts

of the plant are the thick tubers, which, when extracted, expel the tincture known as *Umckaloabo*® (the name *Umckaloabo* stems from the isiXosa word *ukuhlaba*, meaning "to stab" or "stabbing pain," but is also translated as "heavy cough") (Brendler & van Wyk 2008). The indigenous population of the Eastern Cape and Lesotho have used the plant extract for many centuries against respiratory infections, gastrointestinal problems and ear infections. The plant found its way to Europe via Charles Stevens, who travelled to Lesotho in 1897 to find a cure for his tuberculosis. A Zulu medicine man residing in Lesotho gave him a boiled root preparation containing *Pelargonium* to drink twice a day (Bladt & Wagner 2007). Stevens took the plant back home to England, where he unsuccessfully tried to merchandize it as Stevens' Cure. Years later, in the 1920s, the French-Swiss physician Adrien Sechehaye started using Stevens' Cure to successfully treat TB patients. Then in the 1960s, the plant was eventually analyzed at the University of Munich, and in the 1990s *Umckaloabo*® was finally trademarked by the German company Schwabe, which produces and markets the product (Brendler & van Wyk 2008).

Due to its medicinal value, *Pelargonium sidoides* was extensively harvested in the Eastern Cape and Lesotho, mostly to supply Schwabe. The plant collecting practices in the Eastern Cape – mostly undertaken by vastly underpaid plant collectors (who earned 2–4 Rand, 1–2 Euros, per Kilo) – led to over-harvesting and the near extinction of the plant in the Eastern Cape region, until the Eastern Cape government placed a temporary ban on the harvesting and export of *Pelargonium sidoides* in the wild. For many (female) plant gatherers, collecting plants is their main source of income (Lewu et al. 2006), and small suppliers are highly dependent on much larger buyers (van Niekerk & Wynberg 2013). Illegal harvesting has been prohibited since the introduction of the National Biodiversity Act, but it is still an everyday practice.

The Schwabe company, which is still retailing the respiratory infection medicine Umckaloabo® successfully today, appointed two patents at the European Patent Office in June 2007, one on 'Method for Producing Extracts of Pelargonium sidoides and/or Pelargonium reniforme' (EP 1429795) and the other for exclusive use of '*Pelargonium sidoides* and *Pelargonium reiforme* for treating AIDS and AIDS related diseases' (W 2006002837). In 2008, these patents were challenged by three NGOs – the African Centre for Biosafety in South Africa, Der Evangelischer Entwicklungsdienst (EED) based in Germany and the Swiss-based Berne Declaration – in cooperation with the Masakhane community in Alice in the Eastern Cape. The basis for the challenge was, they claimed, that Schwabe had not conformed to the international regulations of the CBD and the South African National Biodiversity Act. Schwabe had not sought prior informed consent to use *Pelargonium sidoides* and had not agreed upon a material transfer agreement with the community. Schwabe eventually withdrew the patents to avoid the stigma of biopiracy. The *Pelargonium sidoides* case is one of the few bioprospecting cases in South Africa

where a local community, supported by national and international NGOs, was able to dispute a patent.

Beyond these more challenging aspects of bioprospecting, there is, in addition to empowering communities, another positive side effect of bioprospecting. In December 2013, Uli Feiter, who was invited to speak at the 3rd Global Congress on IP and the Public Interest and Open A.I.R. Conference on Innovation and IP in Africa in Cape Town, said:

> One result of the tight ABS regulations was that they forced me into benefit sharing agreements with the communities I worked with in the Eastern Cape. I had to open up and negotiate ABS with these communities. Ultimately, the long and intense negotiation phase brought me closer to the culture of the Xhosa people. Eventually, I even started having a close friendship with the village chief (summarized from presentation at the Open A.I.R. Conference, December 2013, Cape Town).

In the course of understanding the Xhosa people's cultural background, Uli was thus more ready to integrate ABS into his work. This marks a considerable change of tone from my interview with him in August 2009, when he was very critical of ABS legislation. Aside from the complications that ABS legislation has bestowed on Uli, he could, after a long process of interaction and negotiation, also see its benefits. One of these benefits is interaction between groups, here a white businessperson from Germany and a black community in the Eastern Cape, which would not have cooperated on this level before. ABS, to some degree, may thus be seen to serve as a measure of black economic empowerment, as well as a way for people on different sides of the bioprospecting agenda to approach one other face-to-face as equal partners. In addition, another side effect is a deeper cultural understanding by white businessmen of black community structures. This positive approach, however, is not inscribed in the perceptions of all traders, as the following examples will show.

"It's Just an Excuse": ABS and the Expansion of Biopiracy

In a similar way to Uli Feiter, Robby Gass, the owner of Zizamele Herbs[22], a bulk and retail supplier of herbal medicinal plants, expressed his unease about ABS. Robby had a contract with the IKS Lead Program to buy the *Sutherlandia frutescens* plants cultivated at the La Serena plantation in De Doorns and retail them to other traders, shops or private persons. I met him on one of his many visits to La Serena. He was not very keen to be interviewed, but after some persuasion he finally agreed on a short interview.

22 Zizamele Herbs merged with Afrinatural holdings, see: www.afrinatural.com.

BR: How do you see the future of access and benefit sharing?

RG: Access and benefit sharing agreements, I believe, will never work. It is – and now I am saying a dangerous thing – just an excuse for the abuse [of indigenous people] of the last centuries. But since there is no benefit, there is no sharing. And in the end, the question is: who is they?[i.e. who are the original knowledge holders with whom the benefits should be shared?]. I had so many different San coming to my office in Barrydale [Western Cape], wearing feathers and beads and skins, they came and told me their story, many of them with different stories (…) but in the end, who are they?

BR: Yes, it is very difficult to define who 'they' are.

RG: The only way [to appropriately share benefits] would be a national trust fund. But with the actual regulations, there will be no fund. It is actually easier to buy plants in China and sell them in South Africa, than breeding and planting them in this country. The regulations don't consider or include the international market, it is almost impossible to put things on the EU market (…) products that have been put before 1993 [year of ratification of the CBD] are still on the market. Beyond that stage, no new product can be found. Until now, only Schwabe did all the necessary work that needs to be done to put a product on the market. The regulations will let the market die. Lucky enough now we have strong cooperation with Brazil. Once the US [has] registered that no one in Brazil or [no] South African citizen dies from our medicine, the US will become interested, and then Europe probably comes and starts to do the necessary research. What are 5 million Dollars [for research and development] for pharmaceutical companies and for the government? But you know, in the end they only want to go for synthetic drugs, not for the natural remedies (De Doorns, January 2010).

Robby was and is very active in the field of bioprospecting. He was not only a plant retailer but was also politically very active, and presented at many workshops and conferences. In the above excerpt of our short interview, he seemed unconvinced that the 'phyto trade' [trading with medicinal plants] has a real future, particularly under current national ABS legislation. Prior informed consent, material transfer agreements, co-ownership of patents, the strenuous application procedure at the ministry and very strict export regulations discourage traders from engaging in the field. In the end, he claimed that the endeavor to implement the CBD by means of the National Biodiversity Act is nothing but a political excuse for and the expansion of centuries of biopiracy. The idea collapses, in his opinion, due to the fact that after all there will simply be no benefits to be shared.

When looking at past ABS agreements in South Africa, this is not an entirely incorrect assessment of the situation. Additionally, Robby's question of "who are they?" resonates with the concerns of others about how to identify knowledge holding communities with whom benefits should be shared. This continues to be a dif-

ficult question in the South African context, with its complex history and multi-ethnic background. Empowered and strengthened San communities, for instance, are more often claiming to have rights to plant-based knowledge in light of their 'first-come' position (see chapter III). But for a trader, identifying "who is San" is virtually impossible. According to Robby, a distributive measure like a national trust fund would help to solve the problem of with whom to share possible benefits.

He also pointed out the dependency of the global South market on developments and movements of the market in the global North. This is mainly based on still prevalent mistrust in countries in the Global North, namely Europe and the US, who maintain that medicinal plants from Africa may not be safe for consumption. Robby thus hopes for a strong development of the phyto-medicinal market in other parts of the world, which might slowly lead to greater trust in medicine from countries in the Global South and to more (global) interest in the South African market.

"There Is no Future for Phyto-Medicine": The Future of Medicinal Plant Trading

Nigle, a botanist and (co-)publisher of several books on medicinal plants in South Africa (i.e. van Wyk & Oudtshoorn & Gericke 200), had himself also conducted extensive research on *Sutherlandia frutescens*. In an interview in August 2009, he told me that *Sutherlandia* is a potent immunity booster supportive in the treatment of HIV/AIDS patients (Gericke 2001). He is also the co-founder of a small-scale phyto-pharmaceutical company that merchandizes *Sutherlandia* tablets. My interview with Nigel took place in the Kirstenbosch Botanical Garden Café. I felt a little uncomfortable with our somewhat secretive meeting. The misty winter clouds covering Table Mountain in the background resonated with my discomfort. First, Nigel was reluctant to meet with me, stating that he hardly ever gives interviews. "Bioprospecting is not an easy field. When you are cited incorrectly, people might attack you," he explained. But Anne Hutchings, a colleague of Nigle whom I had met at the yearly Indigenous Plants Use Forum (IPUF) conference in Stellenbosch, finally convinced him of my trustworthiness[23]. The following summary of the inter-

23 Anne Hutchings cooperated closely with Nigel in the research project on the effects of *Sutherlandia* on HIV/AIDS patients. Anne is a retired university research fellow at the University of Zululand and the author of several books and papers on medicinal plants in South Africa (see Hutchings et al. 1996; Hutchings 2007). Next to her herb garden at the university that she cares for passionately, she works as a social worker in the communities surrounding the university town of Empangeni. She uses a homemade cream containing five different medicinal plants, *Sutherlandia* from the Western Cape being one of them, to treat the shingles and open wounds of HIV/AIDS patients whom she visits in her capacity as a social worker. I joined Anne for some days on her routine visits to patients and their families. She recorded the healing processes of the patients she treated with the cream by taking note of their CD4 count, weight and health

view is based on my recollections supported by the notes I took during and after the interview. To my question of how he perceives the future of traditional medicinal plant trading in South Africa, he answered:

> *NG:* There is no future for phyto-medicine in South Africa, at least not at present. The regulatory framework of the government hinders research on and commercialization of products. I did try to work with Sutherlandia. The plant grows all over the Western Cape and beyond, most healers know about it. But the current regulations make it almost impossible to work with Sutherlandia. I worked a lot with Sutherlandia on HIV/AIDS patients. I have more than 800 files on the effect of Sutherlandia on these patients. It is very detailed and comprehensive information. But the government does not want to know. You see, I understand that people are waiting for a solution for the major problem of HIV/AIDS. Sutherlandia could really help. But the government does not react. They still seem to wait for the endless money flow coming from phyto-medicine [based on the expectation that it will deliver the solution against cancer or HIV/AIDS, for instance] but stand in their own way.
>
> *BR:* What does that mean?
>
> *NG:* Well, it means that the government needs further changes to really open the market. The government is wishing for the integration of local communities into bioprospecting, but with this integration they make the market very complicated and inaccessible. And then there are two paths that the government could follow, the commercial and the public health path. But they only follow the commercial path. They only want to make cash. Otherwise they would consider Sutherlandia as a potent and important plant for the treatment of HIV/AIDS patients. (Cape Town, August 2009)

Nigel, like Robert Gass above, was also frustrated with the current ABS regulations. As a botanist who believes in and lives off the (medicinal) value of medicinal plants, he advocates for a public health approach for the government. But the government only strives for "green diamonds," economic revenue. Therefore, the government would rather proceed with the "commercial path," which is financially more promising, rather than follow the "public health path" that would support local knowledge systems and communities by utilizing existing local resources for the South African public health system. Michael also realized that he should have patented his research results on *Sutherlandia* earlier in his career. He did not, for reasons of social and ethical justice. A patent comprises the exclusion of the knowledge owners; they are neither part of the patent nor are they allowed to use the

changes. Anne, similarly to Michael, proposed *Sutherlandia* as an effective medicine for the treatment of HIV/AIDS patients with a low CD4 count, since, according to her observations, CD4 count increases rapidly when patients take *Sutherlandia* capsules and use the cream.

'invention' themselves. The Masakhane community, for instance, was not allowed to use the extraction method of *Pelargonium* after Schwabe had patented it, even though they and other communities had used it for centuries. Today, Nigel regrets his decision. Other, less socially-oriented institutions will claim patents arising from *Sutherlandia*, without the interest of caring for the knowledge holders.

In sum, constantly reappearing obstacles in bioprospecting lies in the fact that ABS regulations are not transparent enough and are difficult to apply. The legislation is subject to constant friction between the government, traders, indigenous peoples and NGOs. Robby's consideration of buying plant material from China rather than cultivate plants in South Africa seemed like a fatalistic attempt to deal with the situation. As a consequence of these obstacles, many bioprospectors would rather not engage in bioprospecting at all, or will do it illegally, rather than engage with the complicated application procedures. While the CBD/Nagoya Protocol and NEMBA/BABS are supposed to balance out past inequalities, the policies and regulations make the work of medicinal plant traders unattractive and strenuous. This may lead to the total breakdown of the market. This, at least, was Robby's and Nigel's take on the situation.

The case of *Hoodia* presented at the beginning of this chapter is an example of the vigorous process that bioprospecting evokes, not only for plant traders but also for indigenous communities, governments and NGOs. And it shows how easily the market can break down, less due to legislative challenges and more because of the actions of those who play a major role in developing and marketing medicinal plant-based products, namely the huge (pharmaceutical and other) companies, mostly from the Global North. The *Hoodia* case shows that solutions for a fair and equitable sharing of benefits are complex, particularly when the knowledge owner is not clearly identifiable and/or spread across borders. The number of stakeholders and countries involved make the case multifaceted (similar to the earlier example of the mixture containing four plants that Dr. Matsabisa described to me at the IKS Laboratory).

Hoodia Gordonii and the Future of Medicinal Plant-Based Trading

The breakdown of the *Hoodia* market was also the subject of a *Hoodia* Task Force Group meeting that was appointed to be held in Cape Town in September 2009 to develop a plan for the future commercial and scientific development of *Hoodia*, which I was invited to attend by Dr. Matsabisa, the Director of the IKS Lead Program (who did not attend). The following observations and quotes stem from my field notes and later e-mail correspondence. The meeting was organized by the NGO Natural Justice and the Department Environmental Affairs (DEA), and was characterized by an atmosphere of urgency to find a solution for how to revive the *Hoodia* market after Unilever's dropout. The commercial (and political) focus of the

meeting became clear as the participants mainly consisted of members of national and international plant traders and the commercial industry, the government (Department of Environmental Affairs, Department of Science and Technology, the Provincial Government of the Western Cape, Department of Trade and Industry, Department of Economic Development and the environmental organization Cape Nature), members of the Southern African Hoodia Growers Association (SAHGA), with Robby Gass as a leading representative, and Johanna von Braun of Natural Justice. Significantly, no representatives of the San community were present, but they had apologized for being absent.

First, update presentations were given to the delegates by the DEA on current ABS legislation and the permit application process, by the CSIR on the history of research into *Hoodia gordonii*, and by SAHGA on the climate for commercial growers. The debate brought up the most crucial obstacles for successful bioprospecting in South Africa. Mostly debated was the missing and inconsistent research at the national level, with secrecy being highlighted as discouraging overseas research and development companies from looking for solutions in South Africa. Robby Grass claimed:

> Mistrust exists against the quality of products coming from (South) Africa. Instead, China and India are perceived as better sources of medicinal solutions as they have 5000 years of written heritage. Regardless of the plant wealth, South Africa is still perceived as a third world country with terrible hygiene conditions and low quality products.

China in particular has a much higher reputation for delivering quality products. Although much research was undertaken to make P57 applicable to the formal market, countries in the Global North still do not accept *Hoodia* products. Clinical and pre-clinical trials have to be continued in order to back up the claims that *Hoodia* might serve as an appetite suppressant. Such trials would be subject to less strict rules than pharmaceutical-based clinical trials, since *Hoodia* so far counts as a 'food supplement' and not as a 'pharmaceutical'.

Vinesh Maharaj of the DST/CSIR questioned, "Why is more research needed on *Hoodia*? All necessary research had been done long before 2004 and *Hoodia* should not at all fall under the regulations, and restrictions, of NEMBA or BABS. Why access a bus that already left?" Johanna von Braun from Natural Justice answered: "Unilever dropped out and questioned the safety of P57, new patenting opportunities would need to be discovered. The Western world does not yet pay for all additional costs in the product line". The representative of the DEA, Philemona Mosana, proposed that "Academic and political idealism is in tension with the commercial reality and needs." Furthermore, as Robby Gass pointed out:

> National legislation hinders effective commerce and export of Hoodia from South Africa to, for instance, the European Union or the United States. So far, South Africa exports 1% of all plant-based products, including Rooibos as the strongest commercial plant, to the European Union.

A consensus in the meeting was, however, achieved in the observation that through Unilever's involvement in *Hoodia*'s development and commercialization, the image of the plant, and thus of products coming from the region in general, had increased immensely; though it also dropped again after Unilever pulled out. It was nonetheless advocated as a very positive step to have products from (South) Africa "out there."

Another important aspect was continuously repeated. Medicinal plants are not only vital for trading and commerce, but are also an important means for local poverty alleviation and development. The Farmer to Pharma (F2P) Grand Challenge Initiative of the Department of Science and Technology, for instance, was initiated "to combine biotechnology with indigenous knowledge systems and South Africa's rich biodiversity in an effort to position the country to competitively participate in the emerging bio-economy"[24]. It aims to create jobs for communities by helping to establish small, medium and micro enterprises (SMMEs) to facilitate local communities to initiate projects based on medicinal plants as a means of income generation. The outcry for the revival of the *Hoodia* market was thus not only based on the attempt to revive the economic market, but also went hand in hand with the idea of ensuring a sustainable livelihood and poverty alleviation for local rural communities. The Department of Science and Technology thus promotes community-owned commercial plantation sites to provide economic wealth and job opportunities for impoverished communities. Similar projects are being implemented on the basis of other medicinal plants (e.g. *Pelargonium sidoides* and *Devils Claw*).

This initial *Hoodia* Task Force Group meeting was part of a solution-finding undertaking, but was also dominated by many open questions and was more concerned about coming to basic understandings rather than determining the next steps[25]. For one, although the *Hoodia* market seemed to have experienced a serious breakdown, it was nonetheless regarded as a best practice example by which to

24 www.gov.za/aboutgovt/programmes/sustainable-livelihoods/index.html (last accessed July 20, 2014).

25 Two other meetings were scheduled for 2009. One was held in October 2009 to discuss the future potential of the *Hoodia* market. The meeting was attended by members of the regional *Hoodia* working group and by Vital Solutions (a German-based phyto-business), Phytopharm and Phytotrade Africa. The real challenges and opportunities for a future *Hoodia* market were identified and practical solutions were sought (from email, Robby Gass, October 2009). The second meeting, which was set to take place in December 2009, was cancelled for not further explained reasons.

set new precedents. The *Hoodia* case is actually the only known case where an ABS agreement was developed in the South African context. The case created increasing awareness for an integrated system to protect and promote traditional knowledge (Chennels 2010). Moreover, in discussing *Hoodia*, a so far marginalized group of indigenous people, the San community, was brought into the public and political discourse[26]. Without the *Hoodia* case, the San community would probably not have started articulating their needs and objectives in public. *Hoodia*, as an example for other (potential) medicinal plants of South (and southern) Africa, thus stands not only for economic expansion, but also for new (indigenous) agency, one positive side effect of bioprospecting.

Conclusion and Outlook

As the *Hoodia gordonii* case outlined at the beginning, the many workshops, open discussions and solution finding missions in between and the *Hoodia* Task Force Meeting at the end of the chapter revealed, the path towards a fair and appropriate ABS is like a gravel road, bumpy and uneven. On this road, the pursued aim, benefits that can be shared, is hardly ever reached. Even the *Hoodia* example, the only current 'best case example' in South Africa, has not really achieved its goal, namely the regular sharing of benefits with the San Council. Strenuous ABS regulations largely complicate bioprospecting, at least from the view of bioprospectors. The fundamental problem remains how to estimate the value of the intangible property with cultural value of indigenous communities. The complicated illustration of Dr. Matsabisa quite clearly illustrates the complexity of sharing in a facts and figures scheme that does not yet deal with the socio-cultural background and emotional value of knowledge. His earlier statement cited in the previous chapter – "I am not interested in the spirit, I am only interested in the molecule" – suggests that his interest in finding a culturally adequate solution is low. In fact, finding a solution is difficult, as it would demand stepping back from Westernized ideas of property and commercialization.

Often, however, ABS negotiations reach a dead-end before any benefits can be negotiated, either because no product is developed, as was the case in the plant exchange in Thulamahashe, or because a community cannot be detected or is too scattered and widespread (maybe over different countries) to constitute a 'community' with whom to discuss an ABS agreement according to national ABS legislation. For the latter problem, this is a significant hurdle, since cross-national legislation has not yet been implemented for ABS. Even when an ABS agreement is finally negotiated and implemented, as was the case in the *Hoodia* example, it still does not

26 For more information, see: www.san.org.za.

guarantee benefits, at least not in monetary terms. But beyond all of these failings and disadvantages of ABS legislation and to be (or not to be) negotiated ABS agreements, this ABS coin does have another side. ABS entails a clear definition of the owner of traditional knowledge. The owner, mostly indigenous communities, may claim new rights over their knowledge. To quote Marilyn Strathern:

> At no moment in history have we seen the world shrinking in terms of actual resources, and yet expanding in terms of new candidates for ownership. New kinds of entities are being created and new claims for property made (…) and never more so than in the world of biological knowledge or resources (Strathern 2000, cited in Reddy 2006: 165).

This quote leads directly to the other side of the coin of ABS, and knowledge protection or claims of ownership. Different concepts of property in international property law would give more space and rights to those who manage and govern ecosystems – namely indigenous communities – and could ensure the effective conservation and sustainable use of these ecosystems. These rights would not only support sustainable development but would also consolidate the stewardship of indigenous people over their tangible and intangible property. By developing a biocultural community protocol (BCP), for instance, communities may find a stronger voice in their own locales and beyond, be able to demonstrate their biocultural rights, and manage and control their own resources. The following chapter will give space to further engage with this line of thought.

Chapter VII
Partial Solution: The Biocultural Community Protocol

> I don't believe in the commercialization of plants. The important thing is to strengthen the healers in their cultural capacity as part of the community, to strengthen their own values, not the commercial idea that proposes financial benefits.
> Marie-Tinka Uys, Hoedspruit, April 2013

Introduction

As Marilyn Strathern has argued, "The market thus disembeds what is usable, whereas the thrust of the indigenous IPR [intellectual property rights] movement is to re-embed, re-contextualize, indigenous ownership in indigenous traditional culture. Tradition, we may remark, is an embedding concept" (Strathern 1999b: 167). I begin with this quote to unfold the synopsis of this final chapter. After chapter VI, which dealt with the challenges that ABS bestows on the actors involved, this chapter analyzes the extent to which the notion of "cultural property" (Coombe 2009), here culturally embedded medicinal plants and associated knowledge, creates new value (beyond and yet related to commercial value), expressed in newly emerging forms of intellectual property and environmental governance. Holders of intangible cultural heritage are making distinctive claims under the auspices of international treaties, conventions, international customary law and human rights norms (Coombe 2011: 79), which is releasing new "cultural agencies" (ibid.). I argue that the translation process of cultural property from a (local) relational entity to a legal instrument of national and global scale may encourage indigenous peoples' "cultural agency" and induce the valorization of their cultural heritage and identity. The process may also lead to financial revenues if appropriately harnessed (though so far, this has only happened to a limited extent, as the previous chapter has shown). This approach therefore demands critical reflection. Is the enactment of indigenous communities in legal and political language and practices motivated by support for

indigenous peoples, biodiversity and cultural heritage? Or is it driven by more elaborate schemes to gain economic value out of "cultural property" (Takeshita 2001; Yudice 2003)? Or is it a combination of both?

This chapter cannot present a complete answer to these questions that takes into account all variables. What I do aim to do, however, is to provide a situational analysis of the Kukula Healers of Bushbuckridge Municipality in the context of these questions. The largely rural area of Bushbuckridge is currently facing modernization processes and a concomitantly gradually declining biodiversity. In this context, traditional healers can and do play a vital role in the preservation of cultural traditions and biodiversity. At the same time, they must continuously defend their traditions and reposition themselves in a rapidly changing society. Aware of these challenges, the Kukula Healers, in cooperation with local and national NGOs, developed a biocultural community protocol (BCP) to define and govern their cultural property, summarize their core values, strengthen their position in society and ensure their ability to negotiate their needs with external stakeholders. In the process of developing the BCP, the healers had to discuss and develop (new) ways of sharing and protecting their traditional knowledge, aligned to new external conditions. As was described in chapter IV, the sharing and protection of knowledge in healers' traditions is subject to a set of rules and regulations inscribed in customary law. Through the BCP, this existing system was expanded into a new system, a 'traditional knowledge commons pool' (Abrell 2009; Hess & Ostrom 2006), with 'commons' being "a particular form of structuring the rights to access, use and control resources" (Benkler 2006: 24; Ostrom 1990).

This chapter illustrates the transformation and expansion process of one system of knowledge governance into another by asking a set of questions: How did the relations of the Kukula Healers to their property change with the developmen of a BCP? Which actors were involved in establishing the new system? In what contexts are these systems embedded? And what has been the outcome of these processes? Systems of knowledge governance entail provisions for knowledge protection. These systems, when involved in economic exchange, stand in contrast to current intellectual property law, which tries to integrate cultural properties into its established laws. This can be read as the imposition of Western intellectual property law on indigenous communities and their customary laws. Understanding established as well as re-established structures of knowledge governance could help to find new *sui generis* solutions for knowledge protection.

The following celebration of the Kukula Healers, illustrates the intense level of cooperation between the Kukula Healers and several local and national NGOs as well as the government, local tribal authorities, and other local actors such as the management of Kruger National Park, and represents the reorganization of cultural property protection through the development of a BCP.

Interim Celebration in Share

The huge festivity tent sparkled red and blue against the green fields and the high mid-autumn sun in Share, a small village in Bushbuckridge Municipality. The tent was filled with about 300 traditional health practitioners and a number of other distinguished guests. The male healers and the guests were seated on chairs, the women sat gathered in groups on the floor. From time to time, one of the healers jumped up to dance energetically, supported by the clapping hands and drums of the other healers. In this area, a tent of this size would normally indicate either a wedding or a funeral. This gathering, however, was exceptional. It was the interim function of the Kukula Healers celebrating the acknowledgement of a three-year long process that had involved negotiating a non-disclosure agreement (NDA) with a local small-scale cosmetics company on shared plant material and associated traditional knowledge, the development of a BCP, and the creation of a constitution and a code of conduct/ethics for the healers' association. It was also a celebration that signified the custody of the healers over their traditional knowledge of healing and of the biodiversity in which they live, and their role in their communities as well as in conserving the natural resources and knowledge on which they rely.

It was a unique celebration in post-Apartheid South Africa. It was initiated to signify a process of self-determination and integration for a marginalized group that for a long time had been the target of political repression and exclusion. Among the many guests was a representative of the Kruger National Park management, the Kruger to Canyons (K2C) Biosphere Region committee, the Department of Environmental Affairs and Tourism, the Share Community Council, a nurse of the Hluvukane Community Health Center, visiting North American students residing and studying in the nearby Southern African Wildlife College, and a camera team from one of Germany's main TV stations. The CEO of the Kukula Healers, Rodney Sibuyi, officially opened the function with a speech, beginning with the introduction of all of the invited guests. He also mentioned those who were unfortunately unable to attend, most importantly the local chief Philip Mnisi and his cabinet, some local church members and their leaders, and traditional healers from other organizations in the region. He finished his long list of greetings with "*thokozane bayethi ndunankulu*" (may the Lord God be with you at all times). Rodney thereafter continued his speech, passionately recounting the process that the Kukula Healers had gone through to get where they were today:

> My speech will come from what we have developed within our organization, the Kukula Traditional Health Practitioners. In cooperation with Natural Justice in Cape Town and the K2C committee, we managed to develop a biocultural [community] protocol. The reason why we came to develop this protocol is because of the ongoing history that has destroyed our ancestors and the knowledge that was

> taken away by researchers without any access and benefit sharing. Also, we realized that we as healers are not fully recognized by the government. We therefore decided to develop this protocol as a sustainable tool and a public voice that will give us direction at all times. This will also be inherited by the new generation. (…) Our objectives with the protocol are to protect our culture and traditional knowledge, to ensure the sustainable use of biodiversity, to also raise awareness of the above by giving education. We also want to organize ourselves to be respected by society and want us to be linked to the formal health system. Additionally, we want to develop strategies to supplement income and to ensure quality assurance performance. (…) We hope this function will earn [us] more credibility to different stakeholders and the government departments as well.

As he finished, Rodney firmly and self-confidently raised his head, supported by the dancing and clapping hands of his fellow healers. Subsequently, the other guests delivered their speeches, tracked by the camera team that filmed the event for a spot on the German news channel to be shown the next day. Particularly significant was the speech of the representative of Kruger National Park, Soli Themba. He made clear that future cooperation between the park and the healers was both wished for and crucial, particularly with regard to preventing the "pandemic of rhino poaching," as well as engaging in the environmental monitoring of plant species. Given the fact that traditional healers had been denied free access to the many nature and game reserves in the area during Apartheid times, this was a groundbreaking statement. The representative of the Department of Environmental Affairs and Tourism, in turn, promised financial and ideological support for the Kukula Healers in the future. Whether this will ever materialize was at that moment of less importance than the mere presence of a representative from the department, a concession of respect and acknowledgment for the healers. Eventually, after all of the speeches had been held, the printed and laminated copies of the Kukula Healers' code of conduct/ethics and name tags were distributed to every healer, an important step in identifying affiliation to the group and self-recognition as healers.

Finally, it was time to eat. A cow had been collectively chosen through a selection process that had lasted many months. It had been slaughtered in the early morning hours and prepared and cooked throughout the day. Together with a huge amount of pap (maize meal), the meat was served to the visitors. The ceremony continued into the night, with intense drumming, singing and dancing, and the drinking of *umqombothi*, traditionally brewed beer. It was the largest celebration the healers had ever had since their establishment in 2009, and probably one of the largest and most representative celebrations held by healers in a region where healers still struggle for integrity and acceptance.

A Willful Cow and the Dialogic Path to Empowerment

The Kukula Healers had prepared the interim celebration over a period of five months, including planning the huge tent, choosing and purchasing the cow to be slaughtered, and preparing the food for the celebration. This process had included allocating and distributing the money that had been provided by Natural Justice for the Kukula Healers; this was the responsibility of Marie-Tinka of the K2C committee. The money was largely received from the ABS Capacity Development Initiative of the Deutsche Gesellschaft für International Zusammenarbeit (GIZ) and was given to the healers on the basis of a "to-do work plan"[1].

Of the 46,600 Rand given for the time frame July 2011 to March 2012, the 8,000 Rand spent for the cow was at first regarded by Marie-Tinka as an inappropriately large expenditure, and it caused a financial debate between her and the healers. For the healers, the cow was imperative for the ceremony, signifying their strength and willpower in the process of developing a BCP. Symbolically, the chosen cow revealed itself to have quite a willful character. The day she was brought from the *kraal* of the original owner, the *induna* (sub-chief) of Share, to the *kraal* of Rodney Sibuyi, she seemed to have felt her destiny. It took four men to pull the bullheaded cow out of the *kraal* to bind her to a tree, where she was supposed to be slaughtered. She managed to escape, however, and run back to the *induna*'s *kraal*. After being captured and brought back once again, her ordeal ended in a torturous death, with her head being chopped off with a simple axe. The small dispute about the purchase of the cow significantly illustrates the differences in perceptions of the K2C committee member Marie-Tinka, a white, Afrikaans-speaking woman from Hoedpruit, and the needs of the Kukula Healers. Holding a huge celebration without offering adequate food would have been unthinkable for the healers and would have been regarded as disrespectful to the honorable visitors in attendance.

The ambitious speech of Rodney representing the healers was the result of the intense process that the healers had gone through in developing the BCP and subsequent legal tools from 2009 until 2012. Without the development of the BCP, Rodney's relatively self-confident speech would never have happened. During Apartheid, the Witchcraft Suppression Act, originally from 1957, was reinvigorated particularly strongly, and traditional healers had to be careful about what they revealed in public for fear of persecution (mostly related to witchcraft accusations). With the advent of democracy in 1994, this situation has slowly begun to change, though this history still has a lasting effect until today (Ashforth 2005; Comaroff & Comaroff 1993; Geschiere 1997; Niehaus 1993, 2012). With new political amendments, the reputation of traditional healers has slowly begun to improve.

1 The workplan was developed by Natural Justice, also get funding for the collaboration with the Kukula Healers by funding institutions, the GIZ among them.

Today, healers practice their services in a less secretive and cautious manner, although both their practices and knowledge system are threatened by prevailing disbelief, as well as by churches and biomedical health institutions competing for believers and patients. With the BCP, the Kukula Healers constituted and stabilized themselves as a group and negotiated a new form of knowledge pooling, sharing and exchange that differed from traditional forms of sharing and exchanging knowledge. This new form provisionally enabled the healers to negotiate their property with interested parties, such as researchers, research institutions and companies.

The BCP is a tool promoted and implemented by the NGO Natural Justice. The hope is that it may bring about new forms of "dialogic democracy" between healers and their communities, the government, civil society and the private sector, and thus lead to more "rights based development" (Coombe 1998b, 2003, 2009, together with Alywin 2014), as well as to collectivities making possessive claims to act as market actors for economic purposes (Comaroff & Comaroff 2009). Building on Foucault's notions of governmentality (Foucault 1991), Cori Hayden proposes the term 'environmentality' as a "provocative terrain of investigation" in this field (Hayden 2003: 83; Gupta 1998; Argawal 2005). As Foucault explained:

> This word government must be allowed the very broad meaning it had in the sixteenth century. Government did not refer only to political structures or to the management of states, rather, it designated the way in which the conduct of individuals or of groups might be directed – the government of children, of souls, of communities, of the sick (…) To govern, in this sense, is to control the possible field of action of others (Foucault 2002: 341).

With 'environmentality', some scholars (Agrawal 1995, Hayden 2003) have suggested, governance has come to serve in a new international form that changes (and controls) the lives of local people of the Global North as much as the industries and scientific institutions of the Global South. It is not only the environment that the global community and nation states aim to protect and control in order to prevent future threats imposed by climate change or biodiversity degradation, for instance, but also the people who live in this environment.

In addition, intellectual property law is a governance tool that legally forces nation states as well as local communities to adjust to market needs when they engage in the trade of resources. Environmentality together with intellectual property law may suggest new rights-based approaches to citizenship (Coombe 2011: 82) and a new valuation of biological diversity and heritage regimes (Harvey 2002; Watts 1999). Against this background, it can be said, "all ecological projects (and arguments) are simultaneously political-economic projects (and arguments) and vice versa. Ecological arguments are never socially neutral any more than socio-political arguments are never ecologically neutral" (Harvey 1993: 23).

In the context of bioprospecting, new relations, hopes and aspirations may be engendered by intellectual property leverage, instigated by global politics, the state and influential companies. Differently expressed, "Government designates not just the activities of the state and its institutions but more broadly any rational effort to influence or guide the conduct of human beings through acting upon their hopes, desires, circumstances, or environment" (Inda 2005: 1). The web of relations between people, plants, knowledge, politics, law and the economy "creates value, labor, monetary transactions, and capital accumulation, but just as important, is a site of promise, hope, fear, and speculation that itself sets new relationships in motion" (Hayden 2003: 75). As Foucault purported:

> What government has to do with is not territory but, rather, a sort of complex composed relation of men and things. The things, in this sense, with which government is to be concerned are in fact men, but men in their relations, their links, their imbrications with those things that are wealth, resources, means of substance, the territory with its specific qualities, climate, irrigation, fertility, and so on; men in their relation to those other things that are customs, habits, ways of acting and thinking, and so on; and finally men in relation to those still other things that might be accidents and misfortunes such as famine, epidemics, death, and so on (Foucault 2000: 208f.).

Environmentality in the field of bioprospecting of medicinal plants in local communities in the Global South is an interplay between NGOs, which have often become powerful political actors in the context of weak state governments (Oomen 2005), indigenous communities, which ought to be trained in understanding legal and political frameworks, and (intellectual) property, here plants and knowledge. Therein, NGOs act as lawyers and mediators between different stakeholders, interests and emotions, as well as political advocates who encourage actors' compliance with rights, innovation and capacity building (Fowler 2000). Their agency in environmental governance also forges new forms of knowledge held by newly empowered subjects and collectivities, as well as the NGOs themselves. Intellectual property law and the adjustment of communities to these laws are vital for the installment of new approaches to rights.

In addition, environmental governance is dependent on the environment as such. The K2C Biosphere Region plays a vital role in the context of developing a BCP. The region was already introduced in chapter II, but the interview with Marie-Tinka Uys (MT) of the K2C committee in Hoedspruit in May 2012 reflects on the role of the region in environmental governance as well as community development and capacity building. Marie-Tinka was initially hesitant to be interviewed, but did eventually willingly agree to speak to me and be recorded. She included a brief history of the K2C Biosphere Region:

BR: What is K2C, when did it start and what is its purpose?

MT: The K2C has been adopted, or accepted, in the world biospheres network[2] in 2001. Prior to the adoption, we are up now for a 10 years review of UNESCO. The process to get registered was a big stakeholder consultation process. UNESCO takes areas in the world, special areas, next to protected areas where there can be a demonstration of the reconciliation of biodiversity conservation and sustainable development. Illustration-demonstration sites, and they link them to a network. So, in South Africa, we have at the moment six biosphere reserves (…) Now, eh, the process before was (…) eh, in the early 90s, we started a what we call a community development forum, which was the first time that white people and [black] communities started to talk to one another. Because we lived very apart and even today, 18 years after [the end of Apartheid], we are still having very much issues around land being separate. So, at this forum we started to work on issues. We were concerned because conservation is such a huge land use reduction sector in our area that is expanding since the early 90s by thousands and thousands of hectares; that is not going to be sustainable in the future. Here is a new dispensation. It was very exciting to have this interaction between leadership from both sides. It was quite a transformation in terms of who are our leaders in the white community. The white male became suddenly, is, you know, terrible. But maybe some of the white female[s] had a better chance to communicate.

BR: But did the white female[s] become the new leaders?

MT: No, not really. Ya, but in a sense they do. Ehm, the issue here, then in 1998, I wrote a proposal to the World Bank. And they had a sub-program called Melissa, which stands for: Managing the Environment Locally In Sub-Saharan Africa. That program doesn't exist anymore, but they gave me a little money. I was still working at theSouth African wildlife college (I was working there for 8 years). And from there we had driven a consultation process, put the agitation together and then we became a biosphere reserve. We had very little support from the government. The purpose is in the mission and [the] vision is mainly demonstrating the reconciliation of biodiversity conservation [with sustainable development]. When I look at the map and see all these conservation areas and the communities living there, it doesn't look like a sustainable picture to me. What needs to happen, I will tell you (…) we are going to do big projects, there is a big global environmental fund process.

BR: Ya, after the COP 17.

MT: South Africa gets a total of 90 Million USD. Now there are two main objectives. The one is protected areas expansion. They want to expand protected areas

2 UNESCO World Network of Biosphere Reserves (WNBR) (see: www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/biosphere-reserves/world-network-wnbr).

> further for biodiversity species conservation. And the other one is what we call mainstreaming of biodiversity. You know, green economy jobs creation, making sure that the municipalities are doing waste management in line, including the landscape. That can still grow and create an understanding of [the] importance of ecosystems.

The main objectives of the K2C Biosphere Region, according to Marie-Tinka, are therefore biodiversity reconciliation and job creation in the green economy. To get there, the K2C area started bringing black and white leaders of the communities together to establish a functioning cooperation structure. This was in the 1990^{s} after the end of the Apartheid regime. The cooperation between the K2C committee and the Kukula Healers is only one of many such examples where local communities have been encouraged to participate in environmental protection and sustainable biodiversity programs that at the same time (may) generate new green economy jobs. This is an ambitious enterprise, especially in the still highly segregated areas of Mpumalanga and Limpopo Province, where white landowners and black employees have little else in common than an employer-employee relationship. In this context black communities are playing an increasingly important role in the process of sustaining local biodiversity and cultural heritage. The K2C committee fosters the mobilization of communities to claim their rights to resources and traditional knowledge.

In this context, the call of the NGO Natural Justcie to implement a biocultural community protocol was more than welcome, as biocultural community protocols foster the objectives of the K2C biosphere region and it scommittee. As a politically accepted tool it also enforces dialogue with local communities, strengthens community's rights and envision the sustainable protection of the environment. Whether all these so well sounding objectives were put into reality will be scrutinized in the course of the neyt sections, starting with describing biocultural community protocol of the Kukula Healers, its significance for environmental governace as the protection if medicinal plants and traditional knowledge.

The Biocultural Community Protocol: Vision and Reality

In the previous chapter, databases were presented as one solution, albeit limited and not fully satisfying, for the question of how to protect the knowledge used in or generated for medicinal plant products. Databases help to contain already existing knowledge or to document newly discovered knowledge. But they cut out most of the socio-cultural and spiritual aspects of the respective knowledge. They basically cut out the lifeworld of the knowledge holders (Laplante 2009, 2014, 2015). The BCP is thought of as an alternative for knowledge protection. It tries to affirm

indigenous peoples' rights as presented in the Declaration of Indigenous Peoples' Rights to Genetic Resources and Indigenous Knowledge (2007)[3], which begins with the words:

> [We are] Reaffirming our spiritual and cultural relationship with all life forms existing in our traditional territories; Reaffirming our fundamental role and responsibility as the guardians of our territories, lands and natural resources; Recognizing that we are the guardians of the indigenous knowledge passed down from our ancestors from generation to generation and we reaffirm our responsibility to protect and perpetuate this knowledge for the benefit of our peoples and our future generations.

Against this background, a BCP may improve healers' abilities to communicate and cooperate with other stakeholders such as government agencies, researchers and NGOs, in terms of bringing about a better understanding of communities' biocultural values and customary laws related to the management of natural resources and the challenges faced[4].

The NGO Natural Justice is a 'global player' that collaborates with international donor agencies (e.g. GIZ, UNEP) and the South African government (e.g. Department of Science and Technology, Department of Environmental Affairs and Tourism), and acts as a legal broker in the transformation of legal language into comprehensive models. Specifically, it partners with indigenous peoples in the community to assist them to understand the laws that regulate the most important aspects of their lives – their land, biodiversity and culture – by implementing BCPs. Such a protocol is designed as a means to protect communities against biopiracy, to secure (intellectual) property protection and enable communities to speak for themselves in negotiation processes with third parties. A BCP is, therefore, supposed to be a community-led *sui generis* instrument that "promotes participatory advocacy for the recognition of and support for ways of life that are based on the customary sustainable use of biodiversity, according to standards and procedures set out in customary, national and international laws and policies" (Jonas, Bavikatte & Shrumm 2010: 102ff.). In this context "it is important to look not just at the forms of collective and individual identity promoted by practices of government, but also at how particular agents negotiate these forms – how they embrace, adapt, or refuse them" (Inda 2005: 11).

The development of the BCP and the agreed upon 'traditional knowledge commons pool' (hereon TK commons pool) with the Kukula Healers will be described as a new system of knowledge protection, as compared to the traditional way of

3 See: www.ipcb.org/resolutions/htmls/Decl_GR&IK.html.

4 See: www.unep.org/communityprotocols/PDF/communityprotocols.pdf (last accessed February 16, 2016).

protecting knowledge taught in the *izimpande*. The TK commons pool was initiated to react to conflicts that arose in the interaction of healers with third parties and intellectual property law. In the development process, the healers adjusted their traditional ways of governing their resources to a system that enables market openness and control at the same time. While the BCP may seem to be a rights-based solution intended to cope with the demands of intellectual property law by giving space to the collective protection of collectively held property, it does nevertheless have its shadow sides. The BCP is, first and foremost, only provisional and supportive, and is not a legally binding tool. Furthermore, its long-term effects and continuation without the support of donor agencies are not yet identifiable. What then, after all, are the pursued aims of the BCP?

"It is About the Process": BCP Promotion

The NGO Natural Justice, which started implementing BCPs in 2007, is – understandably – convinced of their power and possibilities. Natural Justice was initiated by two law students from the University of Cape Town, Kabir Bavikatte and Harry Jonas, as 'Natural Justice – Lawyers for Communities and the Environment'. According to their website, Natural Justice's vision is "the conservation and sustainable use of biodiversity through the self-determination of Indigenous peoples and local communities"[5], and their mission is "to facilitate the full and effective participation of Indigenous peoples and local communities in the development and implementation of laws and policies related to the conservation and customary uses of biodiversity and the protection of associated cultural heritage"[6]. To fulfill this mission, one of their objectives soon became the implementation of BCPs, not only in South Africa but in many other countries worldwide and not only with traditional healers but with various indigenous communities (including the camel pastoralists of Kachchh, India and the Gunis; Medicinal Plant Conservation Farmers of Rajastan and the Samburu Livestock Breedes).

According to Natural Justice, BCPs are global efforts to integrate and educate indigenous communities about their rights, provide communication and negotiation skills, and to learn about the value of their own tangible and intangible property. In an interview with Gino Cocchiaro, one of the core members of Natural Justice, that I conducted in June 2012 in Cape Town, he articulately promoted BCPs and described their advantages, while continually, though maybe unintentionally, glossing over their disadvantages:

BR: What do you think are the strengths and the weaknesses of the BCP?

5 http://naturaljustice.org.

6 http://naturaljustice.org/representative-work/legal-research/.

GC: Developing a BCP is a process of dialog and communication. A BCP really supports indigenous development. So looking at a community, I mean, what are the fundamental principles and values each community has and looking at visions of the future of the community, what do they want to achieve, how do they define themselves? All these things. This is the way to start. That is really the idea. Working with what is already there. The community principles should be the pillar of indigenous development. Using their processes and visions of the future. That's the way they want to go. That might be, for example, to engage with an external actor, you need to form an association, and they decide if they want to do so, that is how they go on. (…)

BR: What do you see as the weaknesses of a BCP?

GC: If you view a BCP as a piece of paper, then I can understand the weakness. (…) But the actual strength for the community is the process of developing a BCP. And what I mean by that is that, ehm, say we've got a community that comes together. They want a facilitator usually. The process of reflection and internal dialog is one of the positives immediately. Because all these communities, if they are living their lives normally, there is no interaction with external agents, but there's got to be some sort of trigger to develop the BCP. And so discussing the trigger, the interests, that is always a positive process. And so they can discuss. Historically, we have always had principles in line with the foundation of our societies. But how do we address this? And that requires a reflection. I mean, the BCP supports such a process by opening it up, by suggesting opening it up to the community. And it also highlights possibly some of the problems in the community. So if that process brings it to the surface, then this is very positive. And then the community can say: We can always decide to interact with this community, with this project, with the government. That makes them strong. So, that trigger supported a process of the BCP, developed a process where the community grew together. In terms of the Kukula Healers, it brought them to discuss. With communication between government, support from K2C, legal rights were explained, capacity is built, it will just grow. So the BCP might just be a piece of paper, but these guys together have a lot more power.

In the above interview excerpt, Gino Cocchiaro reflects on the influence of a BCP on communities. According to him, the BCP supposedly brings a community together to discuss its needs and wishes, usually in cooperation with a facilitator. The moment of bringing a community together is triggered by particular circumstances. In the case of the Kukula Healers, the trigger was not just one but a conglomeration of many different coincidental developments. According to Gino, the healers' community would have had more difficulties in coming together to discuss their needs without the BCP. This may be true from the perspective of an NGO member embedded in development rhetoric and interested in promoting the BCP. But com-

munities do speak and negotiate a lot, even without a BCP. However, the legal and written authority of a BCP might have had an influence on the perception of the healers, who otherwise would have perhaps 'only' discussed their issues in more private circles.

In the second half of the interview, I insisted again on a reflection on the weaknesses of BCPs. Again, Gino Cocchiaro swerved, but came then to a central problem of many developmental interventions:

> *BR:* But how to keep that [the process of the BCP] a sustainable space?
>
> *GC:* Ya, well, that needs a lot of work with each community. For the lack of anything else, they need support, financial support, capacity. But I mean that, at least we can try to bring that capacity to a certain level. I mean, there might always be the need for support. That is the reality of a certain situation. But I don't think anything will be lost.
>
> *BR:* Yes, but what if, for example, Rodney is not the leading figure who pushes everything?
>
> *GC:* Hmm, ya, these are issues that will come up at a time and they are very true. So the answer to that will be that plans have to be made in terms of succession, building capacity. Of course the BCP has weaknesses. Financial support is one of them. And of course it does not solve all problems. And that people might not, like the government might not pay attention to it. That a BCP can be produced the wrong way and lead into a bad process. But [it] is really about the process, about a BCP not just being a piece of paper.

Gino repeatedly referred to the words (financial) *support*, *process* and *capacity building*, and the difficulties of keeping the processes of self-empowerment and self-sustainability that are initiated by the BCP going. In particular, the dependency on the financial, administrative and legal support of donor agencies like Natural Justice, as well as on the administrative support of the K2C committee, might always remain an issue for the community in question. Natural Justice financed many of the activities of the Kukula Healers, such as larger meetings with the excecutive committee and workshops. The moment finances stop flowing; activities may also come to an end. The communities would then have to build their own projects to sustain their livelihood, which may prove to be an ongoing (perhaps insurmountable) challenge, as will be shown in the course of this chapter. This does not suggest that BCPs are not framed by success, but every coin has two sides. The story of the BCP of the Kukula Healers is a story of success, but also one of subtle frictions that has an unpredictable and fragile future.

The Kukula Healers Coming into Being

Over the six months I spent with the Kukula Healers and intermittently with members of Natural Justice, I learned, through bits and pieces of conversation and in-between stories, to know to history of the Kukula Healers association. It was, in fact, a number of coincidental developments that all came together to bring about the founding of the Kukula Healers in 2009. The NGO Natural Justice, which was founded in 2007, was interested in implementing a BCP in South Africa. At the same time, the K2C committee, the regional organization in charge of taking care of the Kruger to Canyons Biosphere Region, was, among others, interested in initiating sustainable biodiversity conservation and low carbon emission projects in order to fulfill the requirements of being a UNESCO biosphere reserve. In parallel, the core team of the not yet established Kukula Healers had just detached from the larger Bushbuckridge Healers organization to form their own association. Furthermore, the local cosmetic company Godding & Godding was interested in expanding their line of products. Finally, the government, in line with the National Biodiversity Act (2004), was encouraging ABS as a means of poverty reduction and protecting indigenous knowledge as human rights justice. ABS in this sense was seen as a gateway for local development, community empowerment, the sustainable conservation of biodiversity and economic growth.

The key event in the foundation of the Kukula Healers was the fact that, as a result of mistrust, internal quarrels and lack of future visions, a small group of healers from Hluvukane had decided to separate from the largest healers' association in the area, the Bushbuckridge Healers, which was seated close to the municipal capital Bushbuckridge. "The leader of this organization," explained Rodney Sibuyi, "was an uneducated man who never went to school [*impande*], took the membership fees [70 to 140 Rand], but never had any plans or visions for the organization. He only puts all the money in his own pocket." Together with his friends Adah Mabunda and Charles Mthetwa, the three healers decided to leave the group and start their own organization. Rodney applied for funding at Bushbuckridge Municipality, but was rejected on the basis of not having a bank account. He suggested that the money could be transferred to the bank account of the Nyanga Traditional Healers Organization for Africa based in Johannesburg[7], and then sent back to Rodney. This request was also rejected because money used for activities in Bushbuckridge Municipality is strictly meant for local activities, and cannot be transferred to an

7 Many healers in the Bushbuckridge area were, at the time, also members of the Nyanga Traditional Healers Organization for Africa. Being a member of the organization is a guarantee that the healer is capable of healing patients in an ethical, efficient, safe and hygienic way. The organization also works with the government to ensure the good work of traditional health practitioners (www.traditionalhealth.org.za/t/aboutus.html, last accessed January 5, 2015).

organization in another region. Rodney and his fellow healers thus decided to create their own organization, which they called the Traditional Health Practitioners of Bushbuckridge (THPB), with an independent bank account, and from 2009 onwards they started meeting at Vukuzenzele Medicinal Plant Nursery.

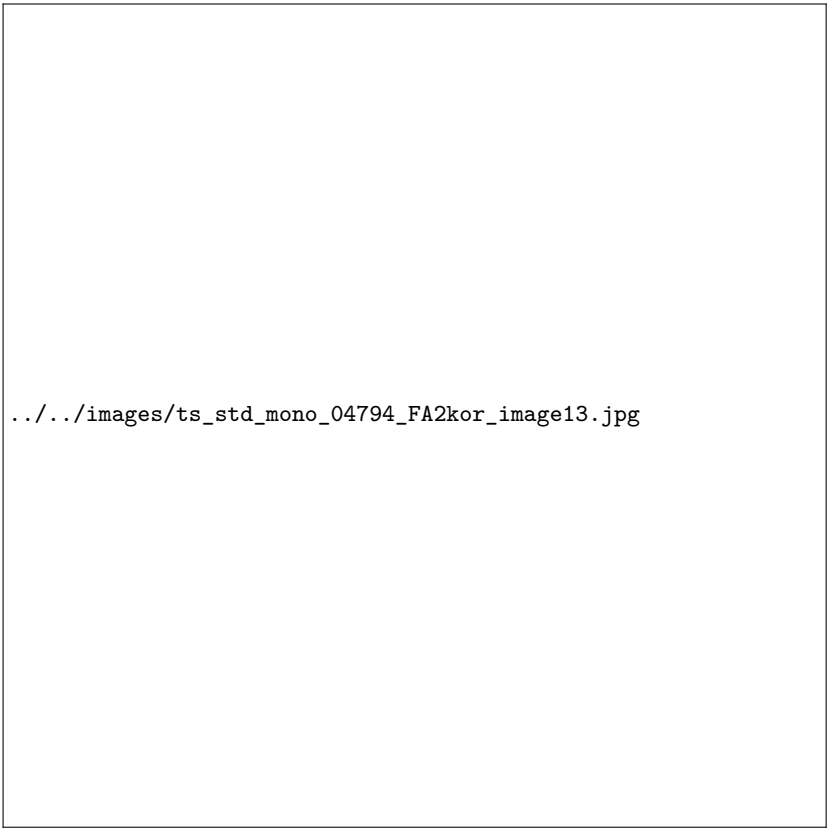
Vukuzenzele is a small medicinal plant nursery in Role, a suburb of Thulamahashe. It was initiated in 1998 under the guidance of Mama Rose, a vivid and ambitious healer in her early sixties. During a visit to Vukuzenzele, Mama Rose told me: I have been working as the deputy director of an umbrella organization at Bushbuckridge, which managed development and income generating projects in the Bushbuckridge area. I then attended a bee keeping course in Cambridge, United Kingdom, and a plant conservation course in Greenglen, Durban (informal conversation, Vukuzenzele, December 2010). Building on her acquired knowledge, she set up Vukuzenzele as a local development project to supply healers with medicinal plants and the government with medicinally valuable tree seedlings (of pepper bark tree, for instance) to sustain the rapidly degrading biodiversity of the area by means of reforestation. Interestingly, Mama Rose also revealed, "You know, Britta, we black people, we know nothing about plants." Was this an idea she had gained in the courses she had attended, I wondered? But Mama Rose did not continue elaborating on this statement.

Later, in 2009, the Department of Water Affairs and Forestry acknowledged the work of Mama Rose and her co-workers by financing a pump to bring water from the nearby river to the nursery. They also sponsored a fence to protect the seedlings and plants from cattle and goats grazing on the adjacent common land. The project continued to grow, and a couple of years later, in 2008, the Department of Social Development offered financial support to the Vukuzenzele project to build two stone buildings: one to serve as an education and conference center and the other from which to sell medicinal plants. When I visited Vukuzenzele in December 2011, the buildings were still under construction, and the finances had basically come to an end. However, Mama Rose remained determined: "I want these additional traditional *rondavel* [southern African-style round huts] as an education center for tourists and school classes." This was, nevertheless, more of an imagined future than a reality. Although the government buys 600 tree and other medicinal plant seedlings every September for the reforestation of biodiversity poor areas, Vukuzenzele was at the time still struggling to survive financially. Mama Rose was hoping that after the COP 17 meeting in Durban in 2011[8], she would be allocating

8 The seventeenth session of the Conference of the Parties (COP 17) conference on climate change was held in Durban in 2011. The K2C Biosphere Region area is affected by climate change (more – and more violent – storms, hotter summers, colder winters), which was an issue discussed at the COP 17.

more funding. Until then, she would put all her personal time and strength into Vukuzenzele.

Figure 13 Plant seedlings watered by healers



The K2C management committee is responsible for tourism, community development and sustainable biodiversity protection in the K2C Biosphere Region. In her function as a K2C committee member, Marie-Tinka was very active in setting up community and biodiversity protection projects in the larger area. Coincidently, the Cape Town-based NGO Natural Justice was interested in cooperating with communities to develop BCPs. To pursue this aim, Natural Justice, under the lead of the African ABS Initiative, first connected with Wayne Twine of the Wits Rural Facility of the University of Witwatersrand[9], who connected them with Marie-Tinka, who

9 The Wits Rural Facility lies at the road to Orpen Gate, about 30 km away from Hluvukane.

then connected them with Mama Rose. Because of her background as a healer as well as her knowledge of beekeeping, her experience with the plant nursery and her extended network of healers in Thulamahashe, Mama Rose was an obvious person to approach to bring healers together to engage in the development of a BCP.

In June 2009, 20 healers of Mama Rose's circle were brought together with the NGO Natural Justice, members of the K2C committee and the Mpumalanga Rural Development Program. This group of different stakeholders discussed issues regarding access to natural resources and medicinal plants and the protection of traditional knowledge. A number of consecutive meetings were held to discuss these issues further. After this first kick-start meeting, the as yet unstructured and unorganized group of 20 healers grew in the second meeting to 80 healers; this included Rodney Sibuyi, Adah Mabunda and Charles Mthetwa, who had not attended the first meeting but had heard of it through their own gatherings of their new healers organization at Vukuzenzele . Due to their rapid growth, the association changed their name from the initial name Traditional Health Practitioners of Bushbuckridge (BHPB) to Kukula Traditional Health Practitioners Association, in short Kukula Healers (Kukula means "we will grow"). It was an impressive start for an association that did not exist before 2009. The rapid growth of the Kukula Healers might have had its roots in the density of the population living in the small villages spreading between the larger trading towns of Acornhoek and Thulamahashe. Intense cell phone communication and mouth-to-mouth propaganda among the traditional healers of the area easily spread the word of the formation of the Kukula Healers as a new group. The lack of any other, similarly successful associations might additionally have contributed to its quick success.

Rodney was already known in the area for being a strong healer, as well as for his wise leadership in the community development council (CDC) of Share/Hluvukane and for his eloquent English. He was therefore immediately elected CEO of the new association. Rodney's fluency in English was invaluable for communication with the K2C committee members as well as with Natural Justice. Furthermore, Rodney was not only the elected spokesperson, but was also the best person in taking the lead.

Since the members of the Kukula Healers were spread across Thulamahashe, Acornhoek and Hluvukane, transportation between the villages was difficult and expensive, which sometimes posed a problem for the regular meeting of all members. The association therefore formed a management committee of 26 healers. These 26 healers would, in turn, be represented by six executive committee members: the CEO Rodney Sibuyi, the chairman Adah Mabunda, the second chairman Charles Mthetwa, the third chairman Lion Thethe, the secretary Singulo Kumalo and the treasurer Lethea Olifant. For meetings with Marie-Tinka, for instance, or for decisions made in the name of the Kukula Healers, the six representatives would meet first. But even this was not always easy; Adah lived in a remote com-

munity called Gottenburg next to the entrance gate to Mayeleti Game Reserve, and Lion Thethe lived in the Welverdiend community, both of which are about 30 minutes' drive away from Hluvukane, where the executive committee met (shifted from Vukuzenzele Medicinal Plant Nursery). Furthermore, meetings were often hindered by money or weather constraints; Adah, for instance, was intermittently unable to come after heavy rains flushed away the road to Gottenburg. Nevertheless, in the monthly meetings, in which every Kukula Healer could participate, the activities and decisions of the executive committee would be discussed with the larger group.

While Rodney managed the Kukula Healers with success, Mama Rose felt usurped and resentfully started to take a distance from the healers, ending in the separation of the Vukuzenzele Medicinal Plant Nursery project from the Kukula Healers. Mama Rose later claimed defensively, "I left the Kukula because of all the work at Vukuzenzele." Rumors said that Mama Rose had 'power issues' and that because of her bossiness, other Vukuzenzele members had also parted from the nursery. For her part, Mama Rose claimed that they had left due to having to do too much work for too little pay: "They don't want to know about plants, they only want to make fast money. After some time, they get lazy. So it is a problem to keep the garden going. You know, Britta, it is much easier to work in a family than in a cooperative" (conversation at Vukuzenzele, December 2011).

At a workshop on the Traditional Knowledge Commons in Cape Town in March 2012, where Mama Rose and Rodney were both invited, some major misunderstandings and personal sensitivities could eventually be resolved. Mama Rose was also able to see that cooperation leads to more (financial) support than smaller solitary projects. The Vukuzenzele project and the Kukula Healers had very similar future plans, including the idea of building an education center on medicinal plants. The work plan for 2013 for the Kukula Healers developed by Natural Justice as a provision for funding also included "the formalization of project cooperation between Vukuzenzele and the Kukula Healers." Nevertheless, Mama Rose remained distant to the Kukula Healers. She still participated in meetings, workshops and celebrations, but mainly kept to herself in Vukuzenzele.

The development of the Kukula Healers would probably not have been so successful without the funding of Natural Justice. The NGO had initiated the first meetings at Vukuzenzele, paid for transportation and food, and provided continuous finances for the development process of the BCP, including several overnight workshops where the management committee of 26 healers was accommodated at the Wits (Witswatersrand University) Rural Facility, as well as for the translation of the BCP into different languages and the printing costs. The financial dependency of the healers on the NGO remained until the point at which I left the area in May 2010, continued until the end of 2015, and may indeed continue further.

The Biocultural Community Protocol

The BCP that was developed between the Kukula Healers and Natural Justice did eventually manifest in August 2010 as a 23 page printed color document, translated into Shangaan, Sesotho and English. It entails detailed information about the needs of the healers, their position and responsibilities within their communities, and their ways of dealing with requests from outside parties interested in their knowledge[10]. The core of the protocol describes the close relationship of the healers with their communities and the surrounding environment, including "How we connect our communities via our culture to our biodiversity"[11]:

> Our harvesting of medicinal plants is guided by our spiritual values and is regulated by our customary laws that promote the sustainability of our natural resources. For example, we ask our ancestors as we harvest to ensure that the medicines will have their full effect, and believe that only harvested leaves or bark that are taken in ways that ensure the survival of the plant or tree will heal the patient. This means that we take only strips of bark, selected leaves of stems of plants, and always cover the roots of trees or plants after we have collected what we require. Also, we have rules linked to the seasons in which we can collect various plants, with severe consequences such as jeopardizing rains if they are transgressed. Because we harvest for immediate use, we never collect large scale amounts of any particular resource, tending to collect a variety of small samples. This inhibits over-harvesting[12].

This excerpt of the Kukula Healers' BCP expresses ecologically-based customary laws that protect the environment and relate the healers to the health needs of their communities. It outlines the values and moral norms of the healers. Certainly, not all of these normative rules are met in everyday life. I actually saw a number of breaches. But documenting these rules enshrines their importance and is an effort to ensure the ongoing respect for threatened cultural tradition and degrading biodiversity. The Nagoya Protocol, which states that parties shall "take into consideration indigenous and local communities' customary laws, community protocols and procedures (Art. 12, Sect. 1), and support the development of [c]ommunity protocols in relation to access to traditional knowledge associated with genetic resources and the fair and equitable sharing of benefits arising out of the utilization" (Art. 12,

10 Biocultural Protocol of The Traditional Health Practitioners of Bushbuckridge, 2010 (http://community-protocols.org/wp-content/uploads/documents/South_Africa-Bushbuckridge_Biocultural_Protocol.pdf).

11 (ibid.: 1).

12 (ibid.: 2); see also: http://naturaljustice.org/video/photo-story-bcp-traditional-health-practitioners-bushbuckridge/ (last accessed October 16, 2016).

Sec. 3 (a)) is the stepstone for developing a BCP. According to Kabir Bavikatte, one of the founders of Natural Justice:

> The value of a community protocol lies in their ability to act as the glue that holds together the total mosaic of a community life that is fragmented under different laws and policies, with the understanding that the conservation of nature is a result of a holistic way of life (Bavikatte 2011: 23).

The fundament behind the promotion of BCPs is all well and good. In everyday reality, however, they are not so easily applicable and ratified and are rather an ongoing process, also framed by failure and delay. These challenges also faced the BCP of the Kukula Healers; for instance, the tribal authority Chief Mnisi was, at first, not interested in communicating or cooperating with the healers about the protocol. Other community members and organizations, like local churches, did also not take cognizance of the new developments of the healers. Nevertheless, the Kukula Healers were eventually successful in completing the BCP, and with it they have implemented a tool to reaffirm their importance in their communities, that enables self-governance, promotes them as stewards over their local resources, and includes them in the preservation of biodiversity and hence of the land and environment in which they live. The BCP as a primarily non-market approach (Brush 1994) is, however, also a means to cope with economic market demands. It provides for legal requirements such as prior informed consent and ABS from "researchers who (in the past) provided us with few details of who they are working for and what our knowledge will be used for"[13]

Another key aspect of the BCP is its push for access to nature reserves, namely Mariepskop, a mountain on the edge of the Drakensberg Escarpment, a biodiverse and fertile area with rare medicinal plants. Over-harvesting by *muthi* hunters and firewood collectors in the communal areas has led to medicinal plants vanishing or being harder to find, and hence to the lack of these plants for healing practices. Accessing nature and game reserves is a strong concern of the healers in order to be able to maintain their customary use of regional plants. The K2C biosphere region, however, is dominated by privately or governmentally owned nature and game reserves. These reserves are inaccessible to the local population and collecting plants is strictly forbidden. The wish to gain access to Mariepskop was documented in the BCP and was discussed with the area's manager Gwyneth Depport at the workshop to develop a Code of Conduct/Ethics, with positive results: the Kukula Healers may enter the nature reserve if led by a knowledgeable guide. Accordingly, the BCP provides a strong call for cooperation and dialog with local authorities,

13 See: Biocultural Protocol of The Traditional Health Practitioners of Bushbuckridge, 2010 (http://community-protocols.org/wp-content/uploads/documents/South_Africa-Bushbuckridge_Biocultural_Protocol.pdf).

the government, the K2C committee, local health facilities like Hluvukane Health Clinic, the South African Wildlife College as well as Kruger National Park and other game and nature reserves. Cooperation and dialog will hopefully strengthen the healers' position in their communities as well as their integration in sustainable environmental protection programs.[14]

When reading the BCP, however, it soon becomes obvious that the ideas have been strongly guided by external actors such as Natural Justice. This is legible in the prevalence of the language of policies and law. Although the content of the BCP is based on the ideas and needs of the healers, Natural Justice has clearly guided these formulations. But what exactly motivated the healers to develop a BCP, aside from the influence of Natural Justice? How exactly does the local situation of the healers look in everyday life? Why did they agree to develop the BCP? What concerns and motivates the traditional healers most in their everyday lives? And how has the BCP been embedded in their personal lives as well as in the lives of their communities?

"Our Knowledge Is Threatened": Traditional Healers in a Changing Society

Besides the rich and deep collection of knowledge of many traditional healers, and the many customary laws that protect knowledge, knowledge transference faces many constraints. Even before the development of the BCP, the healers were aware of the fact that the society in which they live has changed through the influences of modern technology and work migration, and with these changes they felt the pressure to adjust their tradition to meet current demands. In interviews with Kukula Healers members, they recounted challenges that they found threatening to their traditions, like the advent of a modernizing society[15], modern technologies, young people seeking higher education or at least better paid, "clean jobs," the lack of interest of the younger generation in the "old tradition," the tendency towards short training periods for traditional healers with a consequent deterioration in quality of the transferred knowledge, economic, environmental and political changes, as well as subliminal jealousy and envy. When I spoke to Rodney's or Adah's children, they preferred well paid jobs such as working in an office, in the IT sector or in tourism, and they often had a dismissive attitude towards traditional healing,

14 In one example, Rodney Sibuyi and other Kukula Healers were trained as environmental monitors at the South African Wildlife College. In 2014, the Kukula Healers were approached to support Kruger National Park in the fight against rhino poaching, as many poachers were supposed to live in communities next to the park (http://kruger2canyon.linmedia.co.za/articles/news/13173/2012-05-25/traditional-healers-take-a-stand-against-rhino-poaching, last accessed October 30, 2015).

15 Modernization processes in African societies have been largely discussed in i.e. Geschiere 1997 and Geschiere et al. 2008. For more generall discussion on „modernity" see also Giddens 1991, 1994.

claiming instead to be Christians; going to church was declared as incompatible with traditional healing. Indeed, Adah himself explained that the younger generation is no longer interested in traditional healing and customary laws: "They prefer partying," she said, hinting at the *sheebeen* (local pub) opposite her house, "and jobs in the IT sector."

This perceived stance of younger people being against traditional healing stands in contrast to the supposedly increasing number of people who train as traditional healers. One explanation for this is the fact that in today's money-based economy, becoming a healer is (also) a means of economic survival (Dietzel 2013). Normally, a consultation fee is 100 Rand. For additional services, depending on the treatment and the applied and prescribed *muthi*, patients pay supplementary fees. The motivation to train as a healer may also derive from the idea of getting fees for training other healers. Economic incentives, amongst others, motivate people to train as healers, regardless of whether they have had the calling or not. Though while some healers can sustain their livelihoods through the consultation of patients, not all healers are in the position to have many patients, especially in a densely populated area like Bushbuckridge Municipality, with its estimated 8000 traditional healers (estimation from informal conversation with Remember Mathebula, regional politician and former member of the K2C committee). Many healers thus had to rely on other income sources, such as breeding cows, donkeys, goats and chickens, renting out donkeys, running a sheebeen or even leading a church. Many of the Kukula Healers also claimed in interviews that people today prefer to go to the health clinics. Others seek support and spiritual guidance from churches, including the Zionist Christian Church or private churches such as those established by Nigerian migrants. The priests of these churches regularly defame traditional healers and often speak out against people visiting traditional healers at all, based on the accusation that they are manipulative and only want to take people's money. Lion Thethe (LT) explained the influence that the church has had on traditional healing and customary laws.

> *LT:* Customary laws are for the whole [of] Africa. They were the custodians of the moral attitude of the community. That is where the community puts belief and trust. But with the church, the change started from there. But the children who grow up from the church, they are experiencing to live with the church and with modernization. And so, today, people believe only in the clinic, even though the African healers know a lot about disease. Let's say, maybe a child gets sick, because of his or her ancestors. She will die. Before, I remember when a child gets sick. It's critical and when the parents go to the inyanga and he throws the bones and he says there is that person from long ago and you find that problem and when you get home, you will be amazed because the child runs and it [is] healed. Even from the Bible we know, it says: 'Your belief will make you get up

and walk'. We believe in our ancestors. The Bible says, 'How can you love God, whom you cannot see, but fail to love your brother?'

BR: Why do people feel threatened by the healers?

LT: No, they put it in a different way. The Bible says: 'Respect your mother and your father'. (…) But today, the preacher comes and says, 'Your forefathers are demons. (…) Even when your father or mother can let you down, God cannot let you down.

Lion Thethe above illustrates the difficulties between traditional healing and "the churches"[16]: traditional healers believe in the ancestors, while the churches preach belief in God and diminish the power of the elders (ancestors) to substitute for the power of God. He pointedly questioned this stance by asking, "How can you love God, whom you cannot see, but fail to love your brother"?

Against the background, it was nevertheless the case that most of the healers whom I spoke to were members of one of the churches in the area. They had no issue with combining a belief in God with their belief in and work with the ancestors. Rodney, for instance, told me that it was a Zionist Christian Church priest who had suggested that he should train as a healer. Rodney himself had also opened his own "church," located on a spot under a tree next to his house, where people of Share community would gather for a congregation every Sunday. He had never trained as a priest, but he had had the vision that he should "pray with and for his people." Another member of the Kukula Healers, Mr. Ntala (MN), explained in an interview in December 2011 that he did not see any problem with being a traditional healer and a priest of his own church. Even the ancestors seemed tolerant of the combination:

BR: So, you are a priest and a healer?

MN: Ya, I have gone for training [as a healer].

BR: First you were a healer and then a priest? Is there no conflict?

MN: No, not according to the ancestors. I can still give the medicine to the patients.

BR: Was it like a calling to become a priest?

MN: No, I was a healer before, so in the long run, I had a dream that I must change, become a priest. So, I went to someone who was a healer and then a priest. Then I had a dream that I must build a church; I had the dream four times. I heard like a voice like God say that I must build my church here. This is a Zion Church here. Lots of traditional healers, they go to Zion, because they allow them to be healers.

BR: And is your church full?

16 There are innumerable churches in this multi-ethnic region. Additional research would be required to understand the contradictory relationship between traditional healers and local churches in the area.

MN: Yes, it's always full, but a lot of them are healers.

This ambivalent stance of the healers toward the churches, and vice versa, was repeatedly mentioned in other interviews. Ambivalent positions were also noticeable in other realms of the everyday lives of the Kukula Healers and others. Jealousy and suspicion, for instance, were often mentioned as a major factor negatively impacting the process of knowledge transference, which led some healers to not share their knowledge with others. The traditional healer Andaleti Nkomo in the Eastern Cape had this to say on the subject in March 2009:

BR: And do you talk about your knowledge in the community? Do you share your knowledge with others?

AK: Oh, that is a problem, because all traditional healers are jealous. They don't like to share the knowledge. But eh, I am not like this. I started to go to church first. I am open. So, I like to share, I do tell others.

BR: What are people jealous about?

AK: It is like a competition. Because they always will think that patients and clients will come to me and not to the others, when I tell them what I use and people only come to you and not to me.

Andaleti Nkomo thus ambivalently regarded knowledge sharing. She said that she herself did not have any issues with sharing her knowledge, but the fear of envy and jealousy of her fellow healers did hold her back.

Jealousy and suspicion were more often pronounced in interviews in the Eastern Cape than in Bushbuckridge Municipality. The fact that it was mentioned less by the Kukula Healers is presumably because I approached them at a point in time when they had already extensively discussed knowledge sharing in the process of developing the BCP. They were so well versed in the rhetoric of sharing that the idea of not sharing was only pronounced as a means of protecting specialized knowledge, and not motivated by jealousy. This is not to say that jealousy is not a common motivation for secrecy in the Bushbuckridge area. Indeed, jealousy is often associated with witchcraft accusations, which in Apartheid times, but also in the post-Apartheid era (Ashforth 2001, 2005), have made healers particularly vigilant when it comes to knowledge sharing. As Adam Ashforth (2001: 5) has explained:

> Witchcraft in the South African context typically means the manipulation by malicious individuals of powers inherent in persons, spiritual entities, and substances to cause harm to others (…) the motive of witchcraft is typically said to be "jealousy" (which in ordinary usage here encompasses envy).

Comaroff and Comaroff (1991, 1993) argue that jealousy in the context of traditional healing and witchcraft accusation is bound to economic competition. Being an expert of particular knowledge makes one economically superior to other healers,

which creates a mixture of desire and despair, ending in jealousy in times when healers have to struggle for economic survival in a context in which their livelihoods are primarily based on monetary income[17].

With the integration of traditional healers into the legislation and the attempt to professionalize traditional healing (see also Last & Chavunduka 1986; Zenker 2010, 2015) through the registration of all healers at the Department of Health, the attitude towards knowledge sharing has slowly changed in the healers' minds. Lion Thethe, in an interview in January 2012, explained why sharing knowledge has become so important today, and why the Kukula Healers decided to share knowledge with one another, as well as with actors outside of traditional healing:

BR: And does sacred knowledge exist?

LT: We have sacred knowledge, but not in that way, because everything should be in [the] public. If maybe you used to keep knowledge secret, you will find that maybe if you put it out, you can get help. But if you keep your knowledge you make it too confidential. You can't get assistance. People will never know what is your problem. All in all, you have to be open. What is the secret there? It can be a secret among the members. Because maybe I come to her [a healer], I need a treatment, it is maybe her secret because she knows something about this treatment. She may keep that part secret because this is how she can make money. But if I want to know about that secret, I have to go through that training, because this is the only way. But beyond that, with the inyangas [in this context, inyanga are diviners/sangomas], we must share. Because you find that today the government says the doctors must share with the inyangas. Because you find that another person comes to the hospital and the disease the person is carrying needs the inyanga. So the doctors must be free to let him go and then he comes back. Even the inyanga, they mustn't treat the patient until he dies. If maybe you find that our inyanga doesn't have the machine like adding blood or the water [transfusion], so then you take that person to the hospital. And don't be proud or jealous. Bring the person to the hospital. And then you carry on with the treatment. So, if you keep that secret, many people will die.

17 For the scope of this thesis, it would go too far to engage deeply with notions of witchcraft. This has been done elsewhere. Isak Niehaus, for instance, claimed that in Green Valley in the Homeland *Lebowa*, witchcraft and witch hunting is a political occurrence, which represents social changes in society (Niehaus 1993, 2012). He also wrote extensively about the fear of witchcraft in Bushbuckridge/Impalahoek, which he suggests is not only a consequence of a new form of capital accumulation (cf. Geschiere 1997) or the consequences of economic globalization with the formation of "occult economies" (a means to employ magical means for material ends; Comaroff & Comaroff 1998, 1999). It is, he argues, "also about other things, i.e. the re-invention of tradition (Sanders 2003), the accumulation of wealth beyond economic wealth, i.e. accumulation of people and the wealth of people (i.e. accumulation of zomies). Those who were accused of being witches "keeping zombies" were poor in possession and people (Niehaus 2005: 199f.).

BR. So, you also don't mind sharing with the public? With the community?

LT: Yes, we must share, so that people don't hide the diseases that they are having. People, they used to stay quiet sometimes. But you need to be open.

BR: And was it always like that?

LT: No, not always. Before it was really a secret. They were not talking to each other. Maybe you happen to have a problem or a disease you happen to keep secret, only speak to one inyanga. But today, inyanga share and they know which inyanga knows about this and this disease. He can help you then.

Lion Thethe insisted that the sharing of knowledge, especially because of diseases like HIV/AIDS or tuberculosis, is vital. Sharing provides help for people in need and strengthens communication between the different health institutions, an often contested and not always integrative space (Wreford 2008, 2009). Learning "Western ways of healing" (Zenker 2010: 229; Decocteau 2008) broadens knowledge in fighting prevalent diseases like HIV/AIDS. If you do not share, you will not be helped in the challenge of treating these diseases. If knowledge is not shared, mistrust is more likely, which is more threatening to healers than the sharing of knowledge. Openness has, therefore, to some degree been exchanged for the previously highly valued secrecy. "In earlier times," Rodney explained, referring to the times during Apartheid, "we didn't share our knowledge. The knowledge holder owned the knowledge. But now, we [the healers] realized that we need to share knowledge, otherwise this knowledge is going to die" (informal conversation, Share, December 2011).

This new position of knowledge sharing came not least with the awareness that their knowledge has an increased value in the knowledge economy. In an interview conducted in Hluvukane, Rodney (RS), Charles Mthetwa (CM) and Charles's cousin, Pitso Mthetwa (PM), revealed the new stance of the healers with regard to their knowledge and the sharing of this knowledge. I asked about their ideas on revealing knowledge to an external research institution:

BR: (…) If the IKS Lead Program or another research institution would come to ask you for knowledge, would you mind sharing?

RS: Yes, we want to share our knowledge, but only if we come together and come to an agreement, because many people come and take our knowledge. The researchers come and go away with our knowledge.

CM: And make a lot of money.

BR: And the agreement must then be with the healer or with all Kukula Healers?

CM: It must be within the organization. We have the rule: If someone comes, we need to ask him [the following]: What is it exactly that you want to do and what is the amount of medicinal plants you want to have? After we give you this, what are we going to get? What are our benefits? We can't just give. That's why

we came to an agreement with Sue from Godding and Godding. If the research comes right, we need to know exactly what are the profits, because it is our knowledge. Sue does not have the knowledge. She might have the knowledge on how to do the products, but the knowledge comes from us. It is us who know what to use against this and this disease.

PM: Because sharing is good, because you learn (…).

I cannot draw on interviews from the time before the Kukula Healers had started developing their BCP, since I only arrived in the area at the end of 2011. Nevertheless, the idea that knowledge has been taken away by outsiders (in the above quote, by researchers) was probably common to many traditional healers both before and after developing the BCP, and indeed it was often expressed in the many conversations and interviews that I held with them. Realizations of biopiracy were often expressed in sentences like " It is us who know what to use against a disease" or "It is our knowledge", indicating on the value of their knowledge and the threat when someone wants to take "our knowledge" away. At the same time, the realization that the sharing of knowledge may be vital for the future of their profession was also mentioned repeatedly.

This ambivalent stance towards sharing was also reflected in the ambivalent position of traditional healers with regard to the churches or local health clinics and the community. In both the Eastern Cape and Bushbuckridge, many lay people I spoke to outwardly claimed, that they would never consult a traditional healer, though they actually did consult healers – often secretly – for spiritual guidance, as well as for family, job or health related issues. Even Philip Mnisi, the 78-year-old chief of the area between Acornhoek, Thulamahashe and Hluvukane, explained in an interview in April 2012 that he endorses the developments of the Kukula Healers and that he and many others consult traditional healers. Indeed, at no point in the interview, which had up to that point seemed to have been specially formulated for me, the 'white researcher', did he speak negatively about traditional healers:

BR: And have you heard about the BCP? The document that the healers set up?

PM: I have heard about it and also gave [them] permission to dig roots, and now it is officially announced that the healers can dig the roots [on common land].

BR: What is the most important role the healers have in the community?

PM: It is to heal the ailment diseases, because there are diseases even the hospitals cannot heal. But the healers can do that.

BR: Do you yourself consult sangomas?

PM: Definitely.

BR: And the indunas [sub-chiefs], do they also go?

PM: Yes, everybody.

BR: And is there something to support traditional healers to save medicinal plants or knowledge?

PM: Ya, there is such a policy that is there. But you know, most of the people are bypassing, and get access to the land. They perform biopiracy. Like that one who cut the tree yesterday there, and then got fined.

BR: Do you think that your children will go to traditional healers? How will children perceive the future of customary laws and traditional healers?

PM: Ya, the government of today is going back to our cultures, so after some years they are going back to the roots. So, there will not be many changes.

The chief not only acknowledged the healers as important for the communities and their cultural life, but also permitted them to access common land to dig roots and collect medicinal plants. This exception is significant, because the chief is the official in control of administering common land. He is not the owner, as common land belongs to the state, but the organizer and distributor of tenure. He has control over the land titles and is responsible for the allocation of the 'permission to occupy' for residents. In regulating access to common land, he may fine the trespassing of access rules with high penalties. So-called illegal *muthi* hunters, for instance, can be fined by the chief for illegal harvesting, which is a big problem because it leads to the rapid extinction of plants and to traditional healers having to buy medicinal plants elsewhere (mostly from traders from Mozambique).

One day in April 2012, for instance, Rodney's father called him to tell him he had seen *muthi* hunters leaving the commons area, carrying bags loaded with plants. At the time, Rodney and I were not far from the location that Rodney's father described. We jumped into the car and rushed over. As we approached, we saw a white Toyota pick-up truck packed with seven people and seven bags full of plant material heading towards Acornhoek. We passed the Toyota and Rodney indicated for them to stop. The surprised driver stopped immediately. Rodney explained that they were not allowed to collect medicinal plants on the commons without the permission of the chief. He requested that they come to the tribal authority's office on the road to Acornhoek. At the office, they were told to hand over the collected plant material and pay a fine of 3000 Rand. They vigorously defended themselves. "We did not know about the law, that collecting plants on common land is no longer allowed. We never needed permission [before]," they claimed. They continued, "We come from further away and were instructed to collect medicinal plants for Johannesburg *muthi* market." The whole incident made Rodney very agitated. "*Muthi* hunters are threatening our tradition", he exclaimed, "but it is not easy to prevent them from collecting". But now, under the provision of the Biodiversity Act, at least *muthi* hunters can be caught and punished more easily, so "that they know," [not to continue to illegally connect medicinal plants] as Rodney suggested.

The above description of the 'capture' of these *muthi* hunters is an example of the contestation over natural resources in an area where the local biodiversity is under progressive threat. The extinction of plants leads to the extinction of particular knowledge associated with these plants, which is just one of the many threats that the healers experience. In sum, the ambivalence between the denial and acceptance of traditional healing in healers' communities, as well as the urgency to protect indigenous knowledge and medicinal plants, brought the healers eventually to the conclusion that a BCP may be a useful tool in helping to improve their situation.

Reorganizing Knowledge Protection: The TK Commons Pool

As has been shown so far, traditional healing is not a static system. On the contrary, indigenous knowledge is in flux and adaptable, and influenced by other knowledge systems, even though it might retain a nucleus of accumulated knowledge that always remains stable. While secrecy may remain the safest way to protect knowledge, this does not exclude the aspiration to share knowledge with third parties. Accordingly, traditional knowledge systems are subject to both internal and external adaptations and changes. Traditional healers are capable of adapting to changing politics and integrating the transformations of a modernizing society with new demands with regard to public health care[18].

Lion Thethe, in the interview cited above, quite frankly said that traditional healers should share knowledge to combat diseases like HIV/AIDS, as well as to overcome the general mistrust against healers. He suggested that openness creates more trust. Among the Kukula Healers, the sharing of knowledge was seen as commonsense; this had been extensively discussed during the group's establishing phase. The healers had realized that in order to enable negotiations with third parties, neither secrecy nor their traditional way of sharing and protecting knowledge would provide a way forward. Therefore, the relatively strict rules of not sharing knowledge with outside parties were redefined and reorganized. In a process of "reinventing their tradition" (cf. Hobsbawm & Ranger 1992; Prickett 2009), the Kukula Healers sat together to formulate and define this new form of sharing, pooling and distributing knowledge. The result, the 'traditional knowledge commons pool' (TK commons pool), came about as a response to these challenges, epitomizing flexible adaptation rather than fatalism, helplessness and capitulation. This flexibility speaks against the often-reproduced notion that indigenous knowledge is closed,

18 On the relationship between the public health sector and traditional healers, see Freeman and Motsei (1992); Wreford (2008) for South Africa; Meier zu Biesen (2012) for Zanzibar; Langwick (2011) for Tanzania.

non-systematic, holistic and advances on the basis of experience (Banuri & Apffel-Marglin 1993; see also Howes & Chambers 1980; Sillitoe 2002). Instead of looking at indigenous knowledge and traditional medicine as static systems only used for healing, they can be viewed as a strategic resource (Knipper 2010: 205; Meier zu Biesen, Meier zu Biesen et al. 2012; Langwick 2011) to increase the bearer's social and political status and position within society, or as a tool to gain additional "secondary income" (Unschuld 1975) beyond mere healing. In the context of the Kukula Healers, their traditional system of knowledge sharing and protection was transformed into a system adapted to the market, which they used strategically to gain more political power, as well as, in the best case, to generate a secondary income.

The idea for the TK commons pool did not come from the healers themselves, but was introduced by Natural Justice, who suggested that they establish a knowledge commons pool to assemble knowledge on medicinal plants in order to strengthen the healers as knowledge holders and create awareness of their rights to their property. The creation of the TK commons pool required the community of knowledge holders to develop, in accordance with their customary laws, the terms and conditions for access to their knowledge. To enter into such a process, Natural Justice supported them with questions pertaining to legal and administrative rules and regulations, as well as financially with a budget allocated from other funding agencies (in this case the Gesellschaft für Internationale Zusammenarbeit, GTZ). The legal aspect comprised making the language of politics and instruments that commonly protect knowledge in the world of intellectual property law legible and approachable to those who have never been involved with it before. So what does this mean with regard to the TK commons pool of the Kukula Healers?

"We Want to Share Our Knowledge": The TK Commons Pool

"We want to share our knowledge, but only if we come together and come to an agreement," expressed Rodney assertively in a short TV spot on one of the largest German television news channels, the ARD Tagesthemen (daily news). He most probably would not have been able to make this assertive statement without having gone through a number of workshops, trainings and discussions in the course of developing the BCP. The statement indeed had a taste of learned development rhetoric. But how can traditional healers share knowledge that is protected by customary laws and the moral guidelines set out by the ancestors, and protect it against the pressure of commercial interests from outside entities? And at the same time, how can they claim their own economic interests with regard to the disclosed knowledge? As was said in chapter IV, traditionally, knowledge is organized along distinct forms of knowledge transference. It is gained during healer training in a particular *impande*, received from the ancestors and is extended through experience, communication with the ancestors and the sharing of knowledge with other

healers. During the training, it is restricted by specific rules of transfer; the knowledge is embedded in a 'bounded community', guarded by the ancestors, and there are strict prohibitions on sharing knowledge with people outside of the *impande*.

According to the rules and the fact that knowledge is restricted to a particular group of knowledge carriers, traditional knowledge can be viewed as a commons, i.e. "a particular form of structuring the rights to access, use and control [of common] resources" (Benkler 2006: 24; Ostrom 1990). The commons refers to "the great variety of natural, physical, social, intellectual, and cultural resources that human beings hold in common or in trust to use on behalf of themselves, on other humans beings (…) and which are essential to their biological, cultural, and social reproduction" (Nonini 2007: 1). In addition, it is "a resource shared by a group of people that is subject to social dilemmas" (Hess & Ostrom 2007: 3). In her book 'Governing the Commons' (1990), the political economist Elinor Ostrom defined eight 'design principles' for effective common pool resources (CPR) management:

1 Define clear group boundaries.
2 Match rules governing use of common goods to local needs and conditions.
3 Ensure that those affected by the rules can participate in modifying the rules.
4 Make sure that rulemaking rights of community members are respected by outside authorities.
5 Develop a system, carried out by community members, for monitoring members' behavior.
6 Use graduated sanctions for rule violators.
7 Provide accessible, low-cost means to dispute resolution.
8 Build responsibility for governing the common resource in nested tiers from the lowest level up to the entire interconnected system (Ostrom 1990: 90).

A commons has many rules and sanctions that need to be kept alive in order to restrain abuse. Abuse of the commons is, at least in bioprospecting today, also dependent on the forces that come with the demands of the economic market. As Donald Nonini claims, "all commons are functioning arrangements that connect people to the material and social things they share and use to survive and operate outside – but most frequently alongside – capitalist markets" (Nonini 2007: 6). However, he continues, "the functional webs of interdependence that people who organize their lives around a commons have created cannot be reduced to market valuations" (ibid.). Although the market does have an enormous influence on the knowledge commons, it is not totally dependent on market forces. It has and continues to exist independently of the economic market, though some adaptation of knowledge sharing to capitalist market needs does occur.

When knowledge is inappropriately shared outside of the bounded (or secret) community of traditional healers, especially when the knowledge leaves the bound-

aries of the *impande*, it is subject to social dilemmas (Hess & Ostrim 2007: 3). All major aspects of the healers' practice are in danger of losing their purity, and hence power, when not guarded closely (cf. Douglas 1966). Interviews with Kukula Healers revealed that knowledge that is shared without previously requesting permission from the ancestors and/or informing other healers may lead to punishment by the ancestral powers, possibly even the death of the person responsible. I could not definitively determine whether this was mere rhetoric or an actual practice. The narrative went that when the ancestors are ignored, such as when a calling is not followed or knowledge is illegitimately disclosed, the ancestors will punish with illness, social rupture and even death (cf. Ashforth 2005b). This comes into conflict with the call for disclosure made by the CBD and the National Biodiversity Act, a conflict that encourages the "probability of betrayal" (Simmel 1906) through the seductive prospect of potential monetary and/or non-monetary benefits.

To resolve this tension, the Kukula Healers finally decided to reconstitute their original traditional knowledge commons, which prohibited the sharing of knowledge outside of the *impande*, into a TK commons pool – a pool of knowledge that is shared among all members of the association. The TK commons pool that was established has a "commons structure" (Ostrom & Hess 2007), though it is nevertheless different from the original traditional knowledge commons. This pool consists of all knowledge that each individual member is willing to add, as well as all collectively known knowledge that the healers are willing to share with the public. Disclosure to the public can, however, still only occur under specific restricted conditions, to some extent guided by rules manifest in the CBD and the National Biodiversity Act, including notions of prior informed consent, non-disclosure, ABS agreements and co-patenting.

The TK commons pool has blurred boundaries. Rodney told me that when the TK commons pool was discussed, the Kukula Healer members agreed that all knowledge that would help healers to improve their services to their communities and help them to enter into negotiations with outside stakeholders could be shared. A general consensus was also reached that knowledge could not be shared with people outside of the healers' community, unless all members of the community agreed to it. Knowledge, however, is not a fixed entity. It is lived experience and everyday practice. Knowledge lives within every healer and within his or her family and community, and is thus already partially shared in everyday life. One healer told me in an interview, while sitting next to her husband, "You know, I don't share my knowledge with anyone." She then smiled and looked at her husband. "Also not with him." I could see that she was speaking 'officially' here in the interview; personally, I had the impression that she might share some knowledge and/or practices with her husband. Keeping knowledge fully secret in an orally oriented society, where living closely together is a common rule, is difficult. Healers might talk with their spouses or other relatives about plants,

as they are often prepared in the communal living areas. Children may also be sent to collect plants, or at least join in on plant collections. Family members thus habitually get to know about medicinal plants and the preparation of *muthi*, when it is prepared in the healers' homesteads. Knowledge as lived experience, embedded in everyday practices, can thus only be partially kept secret.

Notably, not all members of the group share *all* of their knowledge, because this could lead to the weakening of their individual healing specialization. In interviews, this was articulated in partially contradictory statements. On the one hand, it was claimed, "I don't mind sharing all my knowledge." On the other hand, some healers revealed, "I would keep some knowledge for myself, as it strengthens my position as an expert." This sense of individual ownership over particular knowledge was valued as more important than the collective ownership of the association. From what I gathered in the interviews, it remained vague to me what knowledge exactly had been opened up for sharing and what was kept secret for private and professional purposes. I had the impression that this was a flexible decision made by each individual healer.

As a result, not all knowledge was fed into the newly established TK commons pool. Healers retained knowledge for their own (economic) protection. Therefore, while the TK commons pool can be described as a pool of knowledge shared among a group of people, it has its limitations, which are mostly built, to refer back to Donald Nonini, "alongside the capitalist market" (2007: 6). It is, first of all, built to be able to engage with the demands of the global economic market, i.e. to control knowledge in the global knowledge economy, which is governed by intellectual property law. Second, it has internal limitations due to the fact that nobody knew exactly what knowledge this TK commons pool contained. When I asked about the content, the answers I received were usually somewhat diffuse, ranging from "I share everything" to "I agreed on sharing when someone wants specific knowledge from me" to "I don't share everything." No answer ever revealed what exactly the pool contained, whether knowledge on plants or practices, and who exactly contributed to it. It seemed to be more of a common agreement *that knowledge may be shared*, but not about *what knowledge exactly* is shared.

In the process of sharing their knowledge with the company Godding & Godding, the Kukula Healers thus accepted that their knowledge on the "soapy plant" and the "oily *muthi* mixture" that were involved in the plant exchange in Thulamahashe was open to be shared. The original knowledge of the oily extract, for instance, came from an elderly healer who had migrated from Mozambique and had lived for 20 years in Hluvukane. The form in which this extract was presented at the plant exchange, as a crude oily mixture, was not, however, applicable for the economic market. It demanded further processing, to be done by Godding & Godding. The company did not ultimately find any viable cosmetic value in the mixture, but in the event that it had, the healer would have had to incorporate a line of collective

knowledge holders (i.e. her ancestors from Mozambique as well as the other living healers in the area) into further ownership negotiations. Being part of the Kukula Healers association would have helped in negotiating ownership rights, providing stronger group coherence and a stronger (legal) partner in ABS negotiations.

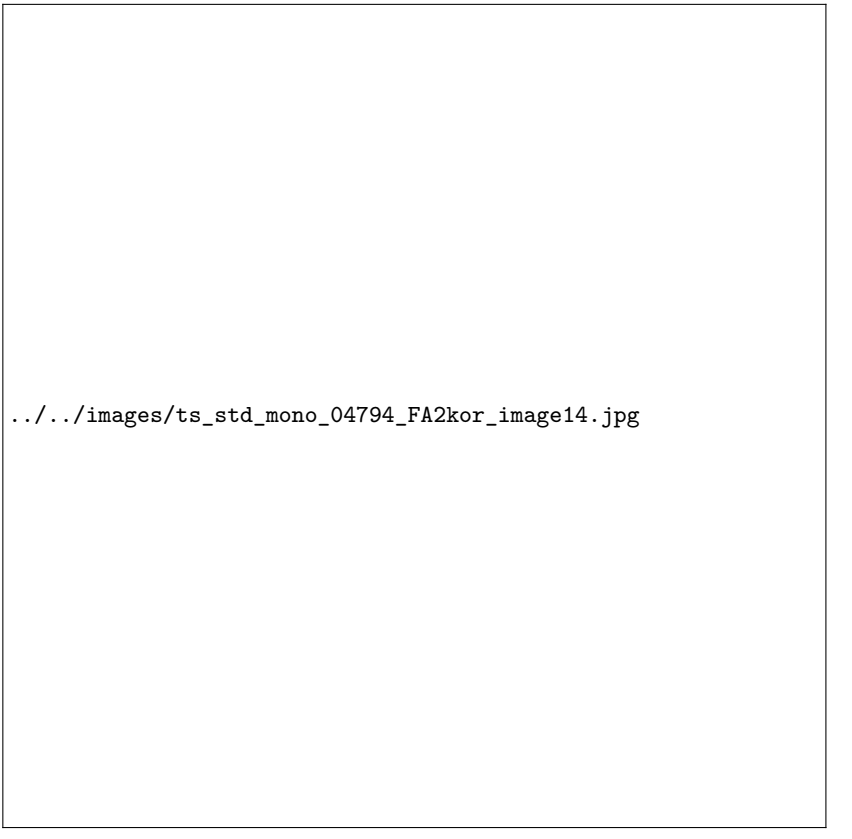
The healers may come together again to agree on the sharing of other knowledge, if another third party (other than Godding & Godding) were to approach them for knowledge sharing. In this case, the same rules would be valid: first, the agreement of all Kukula Healers members would be required before the knowledge could be shared; second, there would have to be a trust relationship between all healers. Trust overrides jealousy and fosters the trustful sharing of knowledge and of any benefits that may materialize. The latter did not transpire during the time that I was staying in the area, and of course its likelihood in the future is not guaranteed. Financial benefits did not emanate from the knowledge exchanged with Godding & Godding, since the company did not continue to work with the exchanged plant material. And though the TK commons pool had been helpful in the case of the plant exchange in Thulamahashe, to me it remains unclear whether it will have a lasting effect.

The TK commons pool remains a blurred entity, which is built on the *inclusion* of knowledge, the *expansion* of people, *setting boundaries* of controlled sharing as well as *limitations* of what is shared and how. It upholds the relations that are attached to knowledge, but allows for an expansion of this web of relations as well as their strengthening. It basically brings people together to discuss the value of their property, knowledge and medicinal plants. This supports Gino Cocchiaro's earlier argument that BCPs, and with them the development of a TK commons pool, brings dispersed and unorganized communities together to discuss their needs, which inevitably leads to them taking a stronger stance with regard to their needs. Knowledge, in an agreed upon TK commons pool, is a binder of social cohesion. In addition, the negotiation process enables healers to engage in a new deep effort of introspection into their values, norms and communities. Lewis Hyde summarized his thoughts on this in his book 'The Gift' (1983):

> When 'knowledge' passes from hand to hand in this spirit, it becomes a binder of many wills. What gathers in it is not only the sentiment of generosity but the affirmation of individual goodwill, making those separate parts a spiritus mundi, a unanimous heart, a band whose wills are focused through the lens of the 'shared knowledge'. Thus the knowledge becomes an agent of social cohesion, and this again leads to the feeling that its passage increases its worth, for the social life; at least, the whole really is greater than the sum of its parts. It brings the group together, the 'knowledge' increases in worth immediately upon its first circulation, and then like a faithful lover, continues to grow through constancy (Hyde 1983: 35).

The following graph illustrates the sharing of knowledge outside of the boundaries of an individual *impande*, but still within the boundaries of all involved *izimpande*. The TK commons pool, through its innovative combination of knowledge sharing and protection, supports the Kukula Healers' ability to govern and further develop their knowledge, while at the same time enabling a coherent group identity, which also strengthens their cultural heritage. This new tool of governing intangible property may, however, lead to legal clashes, as it will be confronted with the legal demands of intellectual property protection.

Figure 14 The TK commons pool



Legal Implications: When Intellectual Property Meets the TK Commons Pool

The Kukula Healers' TK commons pool was established in order for them to have a commonly agreed upon tool to defend their knowledge as intangible property

against those who seek to control knowledge within the boundaries of intellectual property rights and law, in particular research institutions such as the IKS Lead Program and the company Godding & Godding. In the event that a research institution or company approaches the healers for information on medicinal plants, such a request could lead to clashes between the two systems, namely customary law and intellectual property law. The former is a system that protects and governs collectively held knowledge, while the latter protects the inventions and innovations of individual knowledge holders, mostly within larger companies or institutions. When these two systems meet, a battle over rights and law is almost guaranteed.

Historically, the battle of rights and law in South Africa has its origin in the beginning of colonialism in the 17th century. With the invasion of the Dutch settlers it was 'Roman-Dutch law', and with the arrival of British settlers it was 'English law', and these systems were slowly established in the Cape area and gradually forced upon the indigenous population. In colonial South Africa, the state legal system was guided by a positivist approach that ignored the social origin of laws and defined local Africans as having no law at all (Bennett 2004). But customary laws had and continue to exist, and they were/are imbued with socio-cultural values, ethics and traditions (ibid.; Oomen 2005) that were/are lived beyond the legal forces of colonial and later Apartheid and then also post-Apartheid powers. Nevertheless, they "have been treated as inferior, scarcely deserving recognition as true laws" (Bennett 2011: 30) and were never fully integrated into either the colonial or Apartheid constitutions. For highly specialized systems such as state law, the mutability of customary law was regarded as unreliable and incompatible. With the new democratic constitution of 1993, amended and finalized in 1996, customary law was integrated for the first time and "the perception of customary law as inferior to the common legal system slowly reversed" (ibid.: 31).

Intellectual property and indigenous knowledge are concepts that for a long time traveled separate historical pathways. Intellectual property is a generic term for systems of positive law, some of which, such as patent law, have medieval origins (Drahos & Frankel 2012: 1; see also Drahos 1996; Mgbeoji 2006). These ideas underlined property securitization in early, middle and late capitalism (Drahos & Frankel 2012: 3). Indigenous knowledge has much older roots, though it was only recently brought into the legal debate (cf. Brush 1996), and with little acknowledgement of its innovative qualities. Innovation is legally designated to new products only. As a predominantly market-oriented tool, developed in the context of industrialized nations, intellectual property law testifies its inability to deal with traditional knowledge. For example, one requirement of patentability is that an invention has to be novel and documented. Copyright protection, with its requirements of 'originality' and its limitations to what is actually recorded, is thus unsuitable for the traditional songs and melodies of indigenous peoples that often only exist in oral form. "Geographical indication," another prerequisite of intellectual prop-

erty law, also does not apply to knowledge that is habitually used beyond a specific region, often with ownership that cannot be located, as was the case with *Hoodia gordonii*. Concurrently, intellectual property law is unable to integrate traditional knowledge since it is non-inventory, collectively held and inalienable.

Nevertheless, customary laws in themselves have been acknowledged as a form of knowledge protection, most recently with the Nagoya Protocol, which in Article 12 (1) says:

> In implementing their obligations under this [Biocultural Community] Protocol, Parties shall in accordance with domestic law take into consideration indigenous and local communities' customary laws, community protocols and procedures, as applicable, with respect to traditional knowledge associated with genetic resources.

Article 12 (1) of the Nagoya Protocol suggests integrating customary law in accordance with domestic law (which is state law of South Africa). The vagueness of the definition of the Nagoya Protocol may therefore enforce the ambivalent position whereby at state's domestic law eventually overrides customary law (Vermeylen 2013: 190). Putting down customary law in a documented, and thus provable, form may help to balance out this legal power battle; a battle that is not new. Jacques Derrida argued that the continued use of the oral/written distinction is always haunted by the underlying racist distinction of the colonial project (Derrida 1976)[19]. The distinction between state law and local customary laws, which stems from colonial times and where the written word is still regarded as more stable and trustworthy than the oral word (Vermeylen 2013: 192), continues until today. In accordance with the notion of *lawfare* (Comaroff & Comaroff 2009: 53), the healers, with their BCP, conformed to the requirements of a legal system that still insists on provable, written documentation. Narratives such as myths, origin stories and oral customary law are, from a legal point of view, less relevant. But the BCP is also an attempt to put customary laws into a legal form, applicable to the (legal) requirements of the National Biodiversity Act (PIC, NDA, ABS and co-patenting) and intellectual property law, yet with the aim of moving beyond the so far dominant idea of individually held innovations of intellectual property law.

A Sui Generis (Partial) Solution: A Legal Trust

As was indicated above, the manifestation of customary law in a semi-legal tool like the BCP, which is not an official legal tool but may be used in legal negotiations, can be read as an imposition of legal categories and of the written word on oral cultures. Nevertheless, the BCP brings intellectual property law, which demands

19 For further details about the interface between the written and the oral, see also Goody (1986).

written documents as legal proof, together with what is important to the healers. The BCP is thus an intermediary between two different legal systems.

In the discussion on how to make use of the Kukula Healers' BCP with regard to knowledge protection under current intellectual property law, Gino Cocchiaro of Natural Justice and Bernard Maister of the intellectual property unit at the University of Cape Town Law School developed a 'legal trust' model. The legal trust is a model whereby the Kukula Healers, as a legal entity, may decide about their knowledge and knowledge protection schemes as well as about how to share the possible benefits that may derive from their knowledge. It deals with questions such as how to share benefits appropriately in the community and who should take responsibility for this process. The trust model is a legal mechanism with a long history in Western legal regimes, and in South Africa it is recognized and governed by the Trust Property Control Act 57 of 1988. This act defines a trust as "the arrangement through which the ownership in property of one person is by virtue of a trust instrument" (ibid.) placed under the control of another, namely the trustee. The trustee then administers or disposes of the property "according to the provisions of the trust instrument for the benefit of the person or class of persons designated in the trust instrument for the achievement of the object stated in the trust instrument" (ibid.).

Theoretically, in the case of the plant exchange in Thulamahashe between the Kukula Healers and Godding & Godding, the *trust* was based on the property that the healers provided to the company, comprising the plant material itself and the associated knowledge. The *trustee*, as the person or class of persons who can legally administer the trust property, could have been an outside entity, i.e. a lawyer or a K2C committee member, but also a designated group defined within the Kukula Healers association, such as the six executive committee members. The trustee would eventually control and organize the potential benefits arising from the trust and delegate them to the beneficiaries. The *beneficiary* could in this case have been, for instance, children of Kukula Healers members. A legal trust model thus extends the traditional understanding of reciprocity, and even the reciprocity that is implied in the TK commons pool, as it may potentially lead beyond the boundaries of the healers association and reach into the communities or families of the healers.

Practically, the legal trust model only comes into being in the event that benefits actually materialize. In the case of the Kukula Healers and Godding & Godding, this has, so far, not happened. In January 2012, Sue Godding explained in an interview that I conducted with her in the presence of Rodney Sibuyi at the small cosmetics factory situated between Hoedspruit and Acornhoek that "The soapy leaves and the oily liquid have not been analyzed yet. The Christmas business in December had not left any spare time for further research. And, ehm, unfortunately, the leaves have gotten rotten by now, so we cannot use them for investigation any-

more." She apologized for the "bad timing of the plant exchange in December" and reassured us many times that she "still believe[d] in these natural products." "My [black] employees," she added, "do not believe at all in this rubbish. And I, personally, would also prefer to buy nicely packed soaps and creams" (information from interview with Sue Godding, February 2012). To be applicable for the market, the products exchanged by the healers would obviously require some commercial as well as aesthetic upgrading. The Godding & Godding cosmetic silk products, for instance, which are supplemented with 'African additives' such as Marula and Baobab tree essence, are styled with sophisticated white packaging with the G & G initials printed in silver[20]. It is marketed as an expensive product line, mainly for wealthy tourists on their way to Kruger National Park or customers who buy the products in up market shopping malls.

In April 2013, when I went back to Bushbuckridge Municipality for a private visit, I learned that Godding & Godding had still not considered conducting any further research on the offered plant material. Next to their problems with the gioverment for not having complied with the Biodiversity Act regarding some of their products, the company had, in addition, gone through a recession. Even new plant material, which the Kukula Healers had iven to someone in the company, had never reached Sue Godding (personal communication with Sue Godding, March 2013). The company was basically uninterested in further developing anything from the plant material. Marie-Tinka, who had also been part of the plant exchange in Thulamahashe, said:

> Honestly, I don't believe in the commercial path. It is much more important for the healers to stabilize their own position in their communities as social and therapeutic workers and as stewards over environmental knowledge. It was Debby who much more pushed the commercial path (from personal communication with Marie-Tinka, March 2013).

The healers, in contrast to Marie-Tinka's opinion – which to me sounded slightly paternalistic, and also reflected her position as administrator of the financial support that the healers received from Natural Justice – had hoped for the successful development of a cosmetic product, though they adapted to the situation with the motivation to continue with other projects. Rodney repeatedly held, "We must make money, Britta, but how? We must develop our own business." The accusations, pronounced by Kukula Healers, that Debby had taken some of the exchanged material to give it to a German company did not turn out to be true; they were possibly based on the lack of direct communication between the Kukula Healers, Marie-Tinka, Debby and Godding & Godding. Most communication was supposed to be held via Marie-Tinka, but as Rodney told me in December 2013, she had stopped

20 http://goddingandgodding.com.

working with the healers and left the entire communication to another K2C member.

Against this background of the plant material and knowledge of the healers never ending up in a product and hence never materializing any benefits to be shared – a situation that is not uncommon in bioprospecting activities – the legal trust remains a mere theoretical concept. The idea of a trust model therefore can, for now, only stand as a hypothetical 'best case scenario' (also for other communities) and as one further step in the quest for solutions for the fair sharing of benefits arising from bioprospecting. Nevertheless, establishing a BCP, and with it the TK commons pool, helped the healers of Bushbuckridge Municipality to identify their needs, manifest their position in society and understand parts of the often highly sophisticated legal language implied in knowledge protection and ABS agreements, through the many workshops they attended in their cooperation with Natural Justice.

The BCP thus remains a partial solution. The healers had hoped for financial benefits, but were flexible in terms of adapting and reconsidering their original objectives, and remained dependent on the financial support of Natural Justice. Without this support, the healers association would not be able to meet regularly to discuss their objectives and future perspectives. At the time of my stay with them, they had no businesses or projects that offered them any sort of financial income, besides their own individual incomes from traditional healing and/or other small-scale businesses or family support. In this sense, the BCP remained what the World Intellectual Property Organization has defined as a *defensive mode of protection*. The TK commons pool contributed to this defensive mode of protection, as well as to the politicization of the healers, by helping them to view their knowledge as a "strategic resource" (Knipper 2010). It was intended not only to protect their knowledge and claim ownership and governance over their resources, but also to potentially make financial use of their property in the future. The TK commons pool may help the healers, as it enabled them to bundle their knowledge into a pool under their own sovereignty. In adition, the TK commons pool as a new concept was also discussed beyond the boundaries of the Kukula Healers in Bushbuckridge Municipality – i.e. during a workshop in Cape Town in March 2012, which I describe in the section below.

A Traditional Knowledge Commons Workshop (March 2012)

The workshop on the traditional knowledge commons was initiated under the umbrella of the Open A.I.R Network and the GIZ ABS Capacity Developmentz Initiative, and facilitated by Natural Justice, the workshop was entitled 'Non-traditional users of traditional knowledge: Opportunities and challenges around compliance'. Together with Mama Rose and Rodney, I joined the workshop. There were also four

Natural Justice members and three researchers and intellectual property experts from Ghana, Kenya and South Africa. Together, we discussed questions such as "What is a traditional knowledge commons?" "How is a commons possible in a space of multiple cultural backgrounds?" and "How can we make use of the knowledge commons in knowledge protection schemes?"

In the discussions about the traditional knowledge commons, Mama Rose and Rodney explained the cultural and spiritual values of traditional healers in Bushbuckridge Municipality to the other participants, who were mainly legal experts working in NGOs or at the university. Mama Rose explained, "We look at their [the ancestors'] knowledge in a very different way than just a commodity to be bought and sold. We want to be involved in the use of our knowledge and be recognized for our contribution." Mama Rose and Rodney placed emphasis on the cultural and spiritual values of traditional knowledge in the context of an intellectual property law system focused on economic values. The discussions went on in the search for answers to the question of how to protect traditional knowledge in the age of the global knowledge economy. The TK commons pool can define the ownership of knowledge included in potential upcoming products by giving credit to the spiritual and cultural background of indigenous knowledge, though it cannot protect the knowledge when it gets involved in commercialization processes. The discussions were further concerned with the question of how to protect collectively held knowledge under intellectual property law. The inclusion of the ancestors as an entity similar to a legal person could not be (legally) integrated. But it is also possible that their full integration is not necessary or even aspired to in this context. More important may be for academically and legally minded persons to understand the lifeworld of the healers, their epistemology and ontology, in order to support them in governing themselves and the environment they live in.

What I noticed in this regard was an ongoing switch between understanding and misunderstanding between the healers and the other participants. Oftentimes, when one of the legal participants spoke, Rodney or Mama Rose had to come to me for clarification. Since I had lived with the healers for four months at that point, I was somewhat able to translate the highly sophisticated language of the mainly academically and legally trained participants. The convoluted technical language assumed a prefabricated legal language, a knowledge consensus, or a sort of universal truth – and power designation – that Richard Rottenburg has defined as "metacode" (Rottenburg 2009: xxix). The two healers had acquired some understanding of the language and meaning of these metacodes in the many meetings they had had with Natural Justice. They could engage in "code switching" between essentially epistemologically heterogeneous worlds, a process whereby practitioners "develop a specific form of meta-knowledge that enables them to move back and forth between different forms of knowing that become labeled as culturally specific knowledge and globalized knowledge" (Rottenburg 2012). However, even this abil-

ity of code switching did not mean that the healers could fully comprehend all of the language used in the workshop. In turn, when Rodney tried to explain the role of the ancestors in knowledge production, for instance, the academically trained workshop participants also came to me for understanding, as I, after the months spent with the healers, was also regularly engaged in code switching. Even though Rodney's English was good, he nevertheless did not find the right words of the legal language. In attempting to explain the ancestors, he was basically trying to explain something that is non-codifiable in terms of legal languag

The Pursuit of Integration by Law

In their own right, as well as supported – or pushed – by national and international policies and NGOs, the Kukula Healers, by developing a BCP, discovered their potential as environmental entrepreneurs and stewards of their knowledge and the environment in which they live. They developed the BCP and the TK commons pool for their own means, though both were probably instigated (as well as possibly indoctrinated) by the advances of the NGO Natural Justice. Some scholars have noted that not only legal systems but also neoliberal governmentality seeks to empower local communities to recognize traditions as a source of social capital (Bebbington 2004; Coombe 2011; Perreault 2003) and encourage people to adopt a possessive and entrepreneurial attitude toward their culture and the social relations of reproduction that have traditionally sustained them (Coombe 2009: 399; Greene 2004; Lowrey 2008). Comaroff and Comaroff (2009: 56) framed the new entrepreneurial endeavors of indigenous peoples as *ethno-preneurial*. Furthermore, supported by legal tools, mechanisms and institutions, through *lawfare* local communities are pushed into presenting and promoting themselves and to "render cultural identity into the language of copyright, sovereignty, and patent" (Comaroff and Comaroff 2009: 30f.; Comarof 2001), as well as to "forum shop" (Benda Beckman 1981) for the most advantageous jurisdictions and legal institutions both within and beyond the nation state in which to pursue their collective interests (Comaroff and Comaroff 2009: 56–57). The Comaroffs further propose:

> For one thing legal instruments appear – we stress – appear – to offer a means of commensuration: a repertoire of standardized signs and practices that, like money in the realm of economics, permit the negotiation of values and interests across otherwise intransitive lines of difference (2009: 37).

Developing the BCP may be regarded in terms of such "standardized signs and practices" that enable the negotiation of values and interests. In addition, "Law making is power making," as Walter Benjamin (1978: 295) asserted, and hence the intensive quest, or the external demand, that indigenous communities govern

themselves in a system of legal sovereignty also means drawing on their own legal claims and systems. An internal jurisdiction, in short, creates new sovereignty for communities. "Unlike liberal conceptions of rights that emanate from a conceptualization of the individual as the fundamental agent of social activity, a biocultural approach to rights takes as its primary focus the community and the myriad relationships that bind it together" (Abrell et al. 2009b: 5).

The Kukula Healers took this biocultural approach and formed it into tools that allowed them to negotiate within a predetermined system; for instance, the nondisclosure agreement that they made with Godding & Godding was a legal obligation enforced by the National Biodiversity Act. Without an adjustment to these legal tools, the exchange of plant material and further negotiations would not have been possible. A BCP can thus be framed as a tool of *ethno-preneurship*, which encourages communities to claim their rights to their property, and a tool of *lawfare*, the adjustment to legal requirements (see also chapter VI). The legal securitization of the Kukula Healers continued with the manifestation of their own constitution and subsequently a code of conduct/ethics. Gino Cocchiaro, who supported the healers in this process, explained that as "all companies and institutions have a constitution and a code of conduct/ethics, so the healers too sould have such legal manifestations" (from interview, Cape Town, June 2016).

The Kukula Healers Constitution and Code of Conduct/Ethics

For the Kukula Healers to develop a constitution, the process basically required the participation of two parties: the healers themselves as a newly founded association, and the NGO Natural Justice. The former was the executing and receiving party, while the latter was the delivering and supporting party. The healers' lack of a legal education made it necessary for them to receive legal support in formulating the constitution.

The role of NGOs as actors in the field of global policy making and local implementation has been discussed widely (i.e. Escobar 1994; Ferguson 1990; Fassin 2007; Ticktin 2014). Generally, NGOs act as important players in humanitarian and human rights interventions by merging and interacting between the state and local communities (Fassin 2007; Rottenburg 2009; Dilger 2011). NGOs have become the "favored child" of official development agencies (Fischer 1997: 442) in the wake of weakening states in the Global South. They form a wide range of formal and informal linkages with one another, and with government agencies, social movements, international development agencies and communities. These relationships have a profound impact on how globalization, or the implementation of globally accepted efforts like the Millennium Development Goals (MDGs) or intellectual property rights, actually take place and how they are enacted and experienced in local lives (Fischer 1997).

In the case of the Kukula Healers, it was mostly Natural Justice who took the lead in developing the relevant documents. Representatives of the government were at times present, but during the period that I observed, between December 2011 and May 2012, it was only the NGO that worked with the healers. The NGO also suggested that in order to solidify and professionalize the association, a constitution and code of conduct/ethics would be vital. The constitution was developed before I began my research. In a four-page long text, the objectives of the association were outlined, among them: the protection of cultural practices; the sustainable use of biodiversity resources, income and property ideas; rules for the management committee; and the financial responsibilities of the treasurer (to name but a few).

The code of conduct/ethics was then developed in a two-day workshop at Wits (Witwatersrand University) Rural Facility. The workshop was initiated as part of the "to-do work plan" funded by Natural Justice. The participants consisted of the larger management committee of 26 members of the Kukula Healers, Mama Rose, Gino Cocchiaro and Johan Lorenzen of Natural Justice, Marie-Tinka of the K2C committee, Gwyneth Depport of Mariepskop and myself. Equipped with flipcharts and cards, and coffee and tea for the breaks, the workshop was then steered by Gino Cocchiaro and Johan Lorenzen, though Rodney was the main facilitator and translator.

The workshop began with a Christian prayer and continued with intermittent dancing in the coffee breaks, which livened up the focused and target-oriented atmosphere. The objectives of the workshop were, next to developing a code of conduct/ethics, to decide on "signs of identity" such as nametags, a uniform, a logo and, most importantly, a certificate to signify membership, as well as the identification of a "way forward" for the future. According to the healers, having a code of conduct/ethics generally ensures "more power to knock on the door of the government." The two days were filled with intense discussions about customary laws, the ethical rules of the healers and their position in society. The discussions were held in smaller groups that were then brought together in the larger panel. Like many other meetings I attended of the Kukula Healers, I was impressed by the progressive and organized way in which they held their meetings. During the entire six months I spent with the healers, I never witnessed any sort of argument or disagreement, at least not openly. The only conflict was between Mama Rose and the Kukula Healers, and even this seemed vaguely resolved after Mama Rose and Rodney had reconciled at the traditional knowledge commons workshop in Cape Town. Mama Rose participated in the workshop with equal enthusiasm as the others.

The preamble of the code of conduct/ethics underlines the wish of the healers to be trusted and regarded as credible in their communities and by other stakeholders. It also puts forward the code of conduct/ethics as a means of knowledge protection and sustainable use of resources. Representing trustworthiness, integrity and honesty were the core imperatives of the healers, also to counteract still pre-

vailing witchcraft accusations and other preconceptions that exist against them. Subjects like honesty and responsibility, relationships with other healers, patients and apprentices, and consultation fees were also intensively discussed, to ensure the credibility of traditional healers in their communities and to adjust to the requirements of the Traditional Health Practitioners Act (2007), which proposes the professionalization of traditional healers in South Africa with the registration of all healers nationwide. The code of conduct/ethics is a moral and ethical index, especially with regard to healers' behavior, with aspects of the value of reciprocity in knowledge sharing as well as referring patients on: to another healer in case he/she is an expert in a specific field, or to a health clinic in case the healer cannot treat the problem sufficiently. Next to relationships with patients and other healers, the relationship with the environment was also a central point for the healers (probably also pushed by Natural Justice and the K2C committee). The sustainable harvesting of plant material and the prohibition on over-harvesting were expressed as important.

The strong emphasis on the moral and ethical behavior of the healers displays their wish to be accepted and acknowledged in their own communities and beyond. This may also be seen as a sign of the general professionalization efforts regarding traditional healing in South Africa, an endeavor that started at the beginning of the last century already with the establishment of first healers associations.[21] The Traditional Healers Council that is suggested in the Traditional Health Practitioners Act, for instance, only accepts members of an organization and not individual healers. In addition, the Department of Health registers all healers individually. The general idea is that as a registered and certified association, the Kukula Healers have much more negotiating power with regard to other stakeholders such as the government, NGOs, companies, researchers and nature reserve owner.

Apart from attempts to professionalize themselves, neither the BCP nor the constitution or code of conduct/ethics provide a means for financially self-sustaining projects that could help the healers to attain independence from NGOs like Natural Justice. The question of capacity building is, next to local community empowerment, one of the core interests of Natural Justice in their support of such communities. Capacity building was therefore on the agenda for the years

21 The foundation of healers associations in Natal in 1930 demarcated first efforts to professionlize traditional healing. The Natal Native Medical Association, for instance, was founded in the 1920th. The association "hired lawyers, lobbied the national and provincial governments, wrote a constitution, held public meetings, and issued certificates to its members" (Flint 2008: 151). Those healers, who were accepted as members, were regarded as being in a powerful position against those, mostly rural and secluded healers Being a member of an association implied being in a superior position to those who are not included as well as showed a demarcation line to white biomedical physicians. Members of a healers association had "formal education" of a formal training program (ibid.153).

2013/2014. But to what extent did the healers think of their own independence and future plans for self-sustaining development?

Future Scenarios: Self-Sustaining Entrepreneurs?

For the entire time that I was in Bushbuckridge, it struck me how engaged the Kukula Healers were in the association. They always managed to get the management committee of 26 healers together for a workshop or other events. In particular, the four core executive committee members Rodney, Adah, Charles and Thethe were always ready to meet, organize and discuss activities and coming projects. Whenever something was on the agenda, such as speaking to the local *induna* about getting the permission to occupy a piece of land close to Welverdiend community, all four managed to get together. They were deeply engaged in keeping the association going and finding future tasks that may, at some stage, enable them to sustain themselves. Their activities were very much self-motivated. The financial and structural support of the K2C committee or Natural Justice were invaluable, but not the only driving force; though of course having the NGO as a supporter increased their motivation as well as opportunities to move forward.

Consequently, I wondered what would happen to the Kukula Healers once the support and funding stopped, i.e. when Natural Justice decided to close this 'case' to invest in other 'cases', or when the German government stopped supporting ABS as a means of local development. What will happen when the sources that feed these "tales of development" (Escobar 1995), in this case the tale of indigenous entrepreneurship and custody over resources and environmental protection, run dry? Will they remain, in the end, just another tale? Additionally, although the BCP evokes the impression of a positive development for the Kukula Healers, and may stand as a role model for other communities, it does have a questionable downside. The BCP is not an official legal document, and does not have any binding implications. It is, first and foremost, a shiny 23-page long document that can be distributed in the surrounding communities, and at national and international workshops and conferences. But that may be it. Other communities may also want to develop such a protocol, which might be good for Natural Justice, as the NGO is largely supported by donor agencies to implement BCPs. But what, in the end, does the BCP really provide for the Kukula Healers, besides greater recognition and an improved self-image? I can only offer partial answers here, as the protocol had only just been developed and further outcomes will only reveal themselves in the future. However, the long-term effects of the BCP may turn out to have similar implications as many other development efforts: it may simply fizzle out.

The following section is concerned with these questions. Developing the BCP is not just a process of short-term engagement, leading to a document. It should also be a step towards taking responsibility for the governance of collectively held cul-

tural property. It is an attempt to take over public stewardship of these resources and therewith an attempt to engage in public political life and in sustainable environmental protection. But here again, dependency on external factors comes into play. Would the Kukula Healers be in the position to define themselves as custodians over their knowledge and stewards of biodiversity without the support of Natural Justice? How can they provide for their own future?

Capacity Building for an Independent Future

In interviews, many Kukula Healers members expressed the wish to frame options for future cooperation. Some pronounced that they wished that the government would support them more to build up future projects. Others claimed that they "wanted to continue cooperating with the local health clinic to share information on prevalent disease like HIV/AIDS and tuberculosis". The Kukula Healers and the Hluvukane Health Clinic held monthly meetings to share information, but this, some argued, "could be intensified and could even lead to the establishment of a traditional health clinic", where healers would provide health information and cooperate closely with the Hluvukane Health Clinic. Others again wished "to receive additional training from the nearby South African Wildlife College (SAWC) on how to protect medicinal plants and how to plant medicinal plants in gardens or larger plantation projects". These wishes were not unrealistic and could build up cooperation between the healers and other local stakeholders. It would involve the dissemination of indigenous knowledge on healing to local institutions, and in turn the healers would receive knowledge. Many of these visions had already been put into practice. There was regular cooperation between the Hluvukane Health Clinic and the Kukula Healers, some of the healers had received training from the SAWC, and at Vukuzenzele Medicinal Plant Nursery plants were being bred (though the latter was only partially attached to the Kukula Healers). None of these cooperations, however, were income-generating projects for the Kukula Healers.

On one of our many rides on the way to organize activities or conduct interviews, I asked Rodney about the future plans of the Kukula Healers. On these rides, Rodney often fell asleep, and would then wake up and start, while still drowsy, deep ethical and philosophical discussions about leadership ("As a leader you must always be transparent, put things on the table so that your people know what you are doing"), relationships ("No, you cannot cheat on your wife, it is disrespectful") and life ("You must always have a plan in life"). The future of the Kukula Healers, however, was a core subject that concerned him deeply and we regularly discussed chances, opportunities and ways forward. His ideas ranged from eco tourism projects to traditional healing educational centers for the younger generation and for tourists, to a health clinic and a plant nursery. Rodney's 'future philosophies' were probably one of the motivations that drove him to spend a very

large amount of unpaid time and work in the management of the Kukula Healers. Almost every week, we discussed how the Kukula Healers should proceed in the future. But two things were even more pertinent to Rodney than tourism and the environment: it was the survival of the traditional healers' knowledge and practices, in short their cultural identity and heritage and the education of the future generation about these knowledge and practices. A subject close to his heart seemed to be the education of a society that is increasingly losing touch with the environment in which they live and the traditions they have grown up with. Biodiversity is created through interactions between human communities and local ecosystems (Coombe 2001).

The Kukula Healers were pushed by the NGO Natural Justice, which is itself an 'invention' of a particular global political situation of interests in sustaining biodiversity and cultural heritage, the association soon established itself as an environmental agent, standing as an important local steward for sustaining the environment, based on their trans-generational knowledge on plants and the environment. Pushed by this sudden attention, financial support, their new position in society and the remarkable efforts of all healers to keep the association going, they started developing future plans, with two future projects in mind.

First, in cooperation with the K2C committee (the project initiators) and Gwyneth of Mariepskop, the healers assessed a project that combined agro-forestry with the creation of an education center. The project was thought of both in terms of maintaining sustainable biodiversity in the K2C Biosphere Region as well as ensuring local community development, including capacity building and income generation. The main focus of the project was agro-forestry, which was linked to the K2C committee's strong interests in carbon-offset projects (e.g. cultivating plants that take a maximum of carbon from the air) to fulfill its obligations as a UNESCO declared biosphere reserve. But the plan also included the planting of Marula trees and the cultivation of cash crops like maize, organic vegetables and medicinal plants.

The initial project site under consideration was a huge plot of land between Welverdiend and Orpen Gate leading into Kruger National Park, southeast of Hluvukane in the arid area of the Lowveld. The vast, dry plot of land had just a few bushes and trees and very little water; a small streamlet of water flowed through the middle of the property during the rainy season, but in the winter season basically dried up. Making this former patch of bushland into arable land would have required a lot of commitment on the part of the healers. Each member of the Kukula Healers had one or two additional jobs, as well as families and animals to care for. For Rodney, Adah and Charles, reaching the plot would take 40 minutes. Only for the healers who lived in Welverdiend or Clare, the closest villages, would it be possible to regularly work on the land without requiring a significant amount of time to reach the plot. In addition, the healers alone could hardly sustain the costs

of cultivating the land, and hence their dependency on a donor agency would remain inevitable. After seeing the property and evaluating these issues, the proposal seemed unsustainable.

Another idea was to build the project in the even further away Mariepskop, a mountainous yet more fertile area. Getting there would cause even more transportation problems for the healers, not only in terms of time but also financial costs. But on the other hand, getting into Mariepskop, cooperating with the management of the nature reserve and working there would accomplish one of the targets of the healers, namely gaining access to so far inaccessible and closed off nature reserve areas with their valuable medicinal plants. After decades of restricted access to areas that were originally part of their plant collecting grounds, this was quite motivating for the healers, also because communal land is generally overharvested by firewood collectors (fulfilling a daily living need) and *muthi* hunters.

My fieldwork in this area ended before this (or any other) project had come into being, and still in 2012 and 2013, when I revisited the area, the project ideas had not developed further. Indeed, it might simply be one of those 'future scenarios' that are developed in the enthusiastic wake of emerging activism, but which come to an end the moment the support of the donors ends. I can only hypothesize here. I know that some Kukula Healers members had been invited by the management of Kruger National Park to help in anti-rhino poaching activities, while other were involved in the environmental monitoring of medicinal plants[22]. An independent future may yet not be provided with the establishment of the BCP and the traditional knowledge commons pool. Furthermore, Bushbuckridge Municipality remains an impoverished area. Even if a few jobs are created in the green economy sector, they will probably not provide a sustainable future for all Kukula Healers members. But as Marie-Tinka said, this was not the idea of the process. The main idea was the empowerment of local communities. Empowerment is not only about economic stability or future perspectives, but is also about developing a new position in society. And this objective was reached in case of the Kukula Healers, who began cooperating with different local organizations, the Kruger National Park and Mariepskop, the Mnisi tribal authority as well as the NGO Natural Justice. This can be regarded as a first step towards gaining a voice, where marginalization and disregard had once been prevalent. The story of the Kukula Healers continues. Natural Justice continues to financially and legally support them. In 2015, Natural Justice applied for funding from the Open A.I.R. Network to conduct a case study of the Kukula Healers as social entrepreneurs, who continue, in cooperation with local stakeholders, to contribute to the sustainability of the biodiversity and cultural diversity of the region.

22 http://natural-justice.blogspot.de/2015/11/the-kukula-traditional-health.html (last accessed October 16, 2016).

Conclusion

Notably, solutions for ABS and knowledge protection remain partial, local and fragile. The development of a BCP as a procedural, group formation tool seemed to have helped the Kukula Healers to create a group identity, which was grounded on the wish to protect their 'cultural property'. This process was supported by NGOs, Natural Justice and the K2C committee in particular, and was pushed further by the Kukula Healers themselves. The cultural value of their property made them aware of their own value: in their communities, as cultural and environmental stewards, as representatives of a new post-Apartheid South African community that engages in political, legal and economic discourses about rights-based, democratic empowerment.

Despite these positive developments, the process does also, inevitably, have a shadow side. Hardly anything of what the healers had hoped for – financial benefits and the sustainability of their cultural property – had yet come to fruition. It almost felt as if it really was more about the *process* as such and the *capacity* to deal with such a process, as Gino Cocchiaro suggested in my interview with him, than about the protection of cultural property per se. The Kukula Healers had gained recognition in their communities and made an effort to stand up against witchcraft accusations and marginalization. They also managed to cooperate with important, powerful stakeholders, such as tribal authorities, the South African Wildlife College, Kruger National Park and the Kruger to Canyons (K2C) Biosphere Region, and had brought attention to their cultural property as a legally and politically discussed matter.

In this sense, the development of the BCP and of the TK commons pool did have some effects. Whether these effects will have a long-term influence remains to be seen. Tangible outcomes, such as monetary benefits or even non-monetary benefits like a traditional healing education center, were not in sight as of December 2013. *Ethno-preneurial* results were, likewise, only visible in as far as the healers had becom politically and leally more sound (as suggested by the term *lawfare*). The value of the process of developing a BCP is thus less monetary and more political and legal, and oriented fundamentally towards identity and cultural heritage. Reducing the 'value' of bioprospecting to mere economic terms would not do justice to a more complex process. These processes are different in every local context, but they are guided by national and international politics, which in the process of "studying through" cause a different effect each time they are applied. Further research would further contribute to the evaluation of their effects. ABS agreements seem important, and a driving factor behind such processes, but might also be the last outcome that can realistically be expected.

Chapter VIII
Closing Pandora's Box: Conclusion

Introduction

At this point, the trajectory of (the value of) medicinal plants and associated knowledge through the different sites and situations of this research comes to an end. The trajectory led from nature to healers' communities in the Eastern Cape and Mpumalanga/Limpopo Provinces, through the fabric of the biochemical analysis of medicinal plants and into access and benefit sharing (ABS) and intellectual property rights (IPR) politics and (indigenous) knowledge protection. What did this trajectory reveal? What are the results of this long journey through many diverse sites across South Africa, with their many actors and their different interests and motivations? What did this trajectory tell us about the value of medicinal plants and (indigenous) knowledge? What values were we actually talking about when we looked at the values of *muthi* and (indigenous) knowledge? And why are these values so strongly contested in democratic post-Apartheid South Africa?

To answer these questions, this book looked at the specific configurations, or assemblages (Deleuze & Guattari 1997), that emerged in the *contact zones* (Pratt 1992) and sites of research. By following medicinal plants and knowledge through different sites – healers communities in the Eastern Cape and Mpumalanga/Limpopo Province and the Indigenous Knowledge Systems (IKS) Lead Program in Cape Town – this book looked at the discourses and values that emerged from the interaction of different human actors – traditional healers, scientists, members of the government and NGOs – and non-human actors – different medicinal plants (i.e. *Hoodia gordonii* and *Sutherlandia frutescens*) as well as the technologies and devices of laboratories and healers.

At first, the trajectory revealed that bioprospecting, by definition, is a scientific and economic project, with the stakes corresponding accordingly. But soon other values and interests started to play a vital role as well. To grasp all of the values, I unraveled the entanglement of tangible (medicinal plants) and intangible ([indigenous] knowledge) property at each site as well as across sites. I demonstrated that the emerging values were built according to economic, legal and political in-

terests, but at the same time were interrelated with national and local claims of cultural identity and heritage. In short, the book showed that medicinal plants and knowledge are highly contested. This contestation began with the landing of Jan van Riebeck at the Cape in 1652, and has continued until today.

Historical Contestation

This book unraveled the enormous challenges in which medicinal plants as tangible property, but even more so (indigenous) knowledge as intangible property, were and are situated in South Africa. Due to the lack of documented information on the relationship between plants and people *before* the colonial invasion of the Cape in 1652, the contestation between property, people and politics could only be examined from the beginning of (colonial) documentation, which, as has been pointed out, was mostly written by white men (Pratt 1992). These first written records and diaries reveal the ambivalent interactions between early researchers and adventurous travelers and the local population of South Africa, ranging from astonished curiosity and respect for the knowledgeable 'natives' to a totally dehumanizing and dissecting gaze cast on nature and people (ibid.). Driven by the vision of exploring and conquering this *terra incognita* or *terra nullius*, the invading imperial forces thought that natural resources could ultimately be taken without giving anything in return, beyond small material goods such as tobacco or alcohol. Early plant taxonomies and the growing collections of flora and fauna gathered by European universities and botanical gardens are some of the most obvious examples of early biopiracy (Makay 1996). These colonial, mostly non-reciprocal, encounters also reflect the early exposure of local indigenous populations to Western notions of property, an external concept brought to South Africa through the imposition of Roman-Dutch law that forwarded the notion that property is individually owned, an idea that stood in contrast to the views among the local population that property was/is embedded within the relational negotiations of collectively owned possessions such as cattle (Gluckman 1965: 36ff.; Bennett 2011).

The first meetings between researchers and travelers and the local population were individual encounters during the former's journeys into the interior of the Cape and later to the rest of the country (Flint 2008: 96). These encounters were embedded in a "complex space where, despite their highly unequal powers, practitioners from all different knowledge traditions have exercised agency – none of the systems had been hermetically sealed with respect to culture and practice, and none has remained unchanging or static" (Augusto 2008: 193). The exchange of knowledge and resources was thus in constant flux. Over time, medicinal plants "became an important means of establishing dialogue and trust, as well as a means of physical survival" (Flint 2008: 95). Remedies and cures were included in the pharmacopoeia of both sides; white settlers used local remedies to treat local diseases,

while local healers integrated the medicine of white health practitioners into their practices. However, with the ongoing establishment of colonial power, politics and law, this increasingly influenced the power struggle between the colonial rulers and the local people, chiefs and traditional healers, with the latter "representing the existence of a judicial and political system that strengthened chiefs and interfered with the implementation of white rules" (ibid. 109). This 'resistance' to colonial rule was reacted to with yet more restrictive laws and punishments, including the criminalization of traditional healers, mostly out of fear of witchcraft. The ongoing project of replacing traditional medicine with biomedical medicine and practitioners represents the power struggle between the two systems that continues to this day. The principle of taking without giving was expanded during the Apartheid years, with the dispossession of local black (indigenous) populations from their lands and regions and the diminishing of their legal rights, including the right to practice traditional healing, which was prohibited under the Witchcraft Suppression Act of 1957. These restrictions were only slowly reversed following the end of the Apartheid regime in 1994, with South Africa becoming a signatory of the Convention on Biological Diversity (CBD) in 1995, with the promulgation of the new national constitution in 1996, and in 2004 with the adoption of two policies dealing with indigenous knowledge systems, namely the Traditional Health Practitioners (THP) Act (amended in 2007) and the National Environmental Management: Biodiversity Act (NEMBA).

In order to understand the contestation over knowledge in the realm of bioprospecting today, it is important to understand the relationship between knowledge, plants, people and politics in South Africa's history of colonial invasion and Apartheid. As has been shown, plants and knowledge were never 'just' resources, but were strongly linked to territories, politics and the law, and were from the beginning entities in interaction, which rendered biopiracy an issue from the very beginning.

Ambivalent Relations: Secrecy Versus Disclosure in the Global Knowledge Economy

To understand the value of plants and knowledge in the context of bioprospecting in contemporary South Africa, I also had to reflect on my own position as a researcher from the Global North; an issue that was strongly linked to the central point of this book, namely the ambivalent relationship between *secrecy* as a means of protecting knowledge as well as traditional culture and values, and knowledge *disclosure* as a means of making (potential) economic, socio-political or humanitarian gains. My position as a researcher ranged from my being angrily chased away to being warmly welcomed and integrated into healers communities. I never asked for knowledge on plants, but I was nevertheless put in the position of be-

ing an alleged biopirate who could potentially sell the plants and knowledge of my interlocutors to pharmaceutical or other companies. On the other hand, I was regarded as someone who would bring information about the healers to the rest of the world, i.e. in the form of a published book, as well as other forms of 'speaking for' traditional healers[1]. No less ambivalent was my position at the IKS Laboratory, where I was easily integrated, yet most of the knowledge and meetings remained closed to me, the inquiring ethnographer, perhaps as a result of the information feudalism of the global knowledge economy (Drahos 2002). Disclosing scientific knowledge to outside persons or scientific entities could mean losing the rights to that knowledge, usually claimed in the form of a patent. Hence my position as an ethnographic researcher was as ambivalent in the biochemical laboratory as it was in the realm of traditional healing.

As an inquiring researcher, I was thus subjected to the politics of bioprospecting, which nowhere were more salient than in the ambivalent incongruity of knowledge protection versus knowledge disclosure. Some knowledge was disclosed to me, but most was kept secret. Secrecy and customary rules of knowledge protection are still valid and effective today, but they are partially disrupted by the seduction of knowledge disclosure, which is transported with the message of the global knowledge economy and manifested in the idea that when disclosing valuable knowledge, the knowledge discloser might be able to reap certain benefits, ensured through the settling of an ABS agreement. This message came with the ratification of the CBD and the National Biodiversity Act, as well as the agreement on Bioprospecting and Access and Benefit Sharing (BABS 2008), which was slowly disseminated to rural areas and local (healers) communities via word-of-mouth, transferred from healer to healer, within healers associations as well as in trainings and workshops held by NGOs and the government. Some healers communities that received and understood the message of ABS and the opportunities that supposedly came along with it considered it worth taking the chance of disclosing previously secret knowledge.

The IKS Lead Program, for instance, was one institution where knowledge on medicinal plants or plant mixtures could be disclosed by traditional healers and other citizens. Disclosure was only possible following specific rules and guidelines, which stated, for instance, that a prior meeting had to be held with IKS staff members in order to share information about the claim and to create a trust relationship. These meetings were not intended for the in-depth sharing of cultural information, but for the sharing of information that would be crucial for the consequent scientific analysis. In the case of the medicinal plant claim of *Rohelia* made

1 I gave, for instance, a one-hour radio interview about the research to a German audience on RBB Kulturradio (July 8, 2010), and contributed information to an online article (also in German) for the Berliner Tagesspiegel (July 10, 2010): http://m.tagesspiegel.de/von-heilern-und-heilpflanzen/1878480.html.

by Mrs. Dihara in Beaufort West (see chapter V), the cultural background of the claim (and claimant) was not at all important; the information of interest to the IKS Lead Program was related to the disease that was being treated by the claim and how successful the claim had been so far, both of which had to be proven with patient records. The vital information obtained in relation to the claim of the Mdehle Inyanga Healers Association, a more 'indigenous claim', was about the disease it treated (diabetes), its dosage and that there was a successful record of treated patients. Deeper cultural or spiritual knowledge was not discussed in the meeting.

However, the Mdehle Inyanga healers had, prior to the meeting, discussed among themselves whether they wanted to share the knowledge, and had likely consulted the ancestors for approval to disclose it to the IKS Lead Program. Knowledge held by healers communities is not supposed to be shared without the agreement of the ancestors, as Ntate Ndeni explained to me. It was repeatedly said by various healers that those who disclosed knowledge without the ancestors' permission could be punished with disease and even death. Though I personally never came across an example of a healer whose death was said to have resulted from the improper disclosure of knowledge, I nevertheless understood the ancestors here as a moral entity controlling and protecting the dissemination of knowledge. Losing control over knowledge also means losing control over cultural being, social cohesion and well-being in communities. Therefore, knowledge requires comprehensive protection, which was traditionally provided by the traditional knowledge protection system of sharing knowledge only within the boundaries of the *impande*, a hierarchically structured body with elder healers (*magobela*) training the younger healers-to-be (*thwasa*) before they can be initiated. Knowledge sharing beyond the boundaries of the *impande* is well guarded, both by the healers themselves and by the ancestors.

This generations-old traditional knowledge protection system does not, however, provide sufficient security in the global knowledge economy, where knowledge, once subject to commercialization in the form of a product, is commonly protected under intellectual property law. When indigenous knowledge is disclosed to a third party, such as the IKS Lead Program or the company Godding & Godding, the knowledge leaves the secured space of traditional knowledge protection and enters a new unprotected realm that is governed by economic market-oriented tools of intellectual property law. In this unprotected space in the interstices between customary protection and intellectual property protection, knowledge is vulnerable and subject to easy abuse. In recognition of this issue, alternative means of knowledge protection have been sought that can maintain the traditional knowledge protection system, and is at the same time capable of adapting to intellectual property law.

Bioprospecting Trapped: Torn Between the Commons and the Anti-Commons

In chapter I, the *tragedy of the commons* (Hardin 1968) – the over-utilization of common resources – was contrasted with the *tragedy of the anti-commons* (Heller 1998) – the under-utilization and overprotection of common resources, which disturbs the continuation of research and development. As has been shown throughout this book, in the activity of bioprospecting both 'tragedies' play a fundamental yet contradictory role. Indigenous peoples have long been subject to the tragedy of the commons: their resources have been (over-)utilized by outsiders over the course of many centuries of biopiracy, but also by their own over-use, i.e. through firewood collection and the over-harvesting of certain plant species. The politics of the CBD and the National Biodiversity Act restricted access to natural resources and (indigenous) knowledge and prohibited the free collection of plant material both by and for the use of healers as well as by and for companies and research institutions. Furthermore, in their quest for new drug leads, some companies began simply to screen random plant samples collected directly in nature, without including indigenous communities, traditional healers or their knowledge.

Uli Feiter, the owner and director of the medicinal plants and pharmaceutical company Parceval, for instance, expressed his resentment over the National Biodiversity Act, mostly because it infinitely complicated his business with medicinal plants. He nevertheless ultimately decided not to give up altogether and endeavored to work more closely with local communities in the Eastern Cape (in part because he was already fully occupied with the Pelargonium trade). Being sued for biopiracy would most probably have doomed his company, so collaboration was the best way forward. The company Godding & Godding, in contrast, eventually dropped out of further cooperation with the Kukula Healers, basically due to the problems that arose over being charged for not having appropriately complied with the National Biodiversity Act. Therefore, the new biodiversity legislation, while it enables the protection of medicinal plants and indigenous knowledge, is also a threat to those who are engaged in bioprospecting.

Here I want to come back to the question of whether and how it is possible to make economic use of medicinal plants and the indigenous – partially sacred and spiritual – knowledge attached to them, while simultaneously protecting knowledge and plants against inappropriate (ab)use by 'outside' companies, research institutions and/or individual researchers. Chapter VI displayed how ABS politics seem to provide more obstacles than opportunities. I described how companies (such as Godding & Godding), businessmen (like Robby Gass, Uli Feiter and Nigel Gericke) and scientific institutions (such as the IKS Lead Program) had to figure out how to share benefits, and frequently came up against the mostly unresolved questions of what to share and with whom. I examined biocultural community protocols (BCPs) as a proposed integrative community approach to circumvent or

at least deal with the obstacles that ABS and IPR politics induce. Before any form of ABS agreements can be negotiated, however, medicinal plants and associated knowledge first have to go through a translation process, from plant and knowledge embedded in the cultural context of healers' communities to a pharmaceutical or cosmetic product of use in the commercial market. The first step in this translation process, which in itself is not easy to reach, is that a plant must find its way into a biochemical laboratory for analysis.

From Indigenous Knowledge to Scientific Knowledge to Economic and Scientific Value

The IKS Lead Program in Cape Town, a governmentally owned scientific program aimed at supporting and promoting indigenous knowledge systems, had the task of scientifically advancing indigenous knowledge systems and medicinal plants. Medicinal plants reach the laboratory – if it all – in manifold, non-linear ways. Either plants that are already known are re-screened for new valuable compounds, or promising new plants or plant combinations are disclosed to the laboratory in the form of medicinal plant claims made by traditional healers and other citizens. Once a plant or plant combination has entered the laboratory, it traverses a process of *particularization*, *abstraction* and *validation* (Agrawal 2002) aimed at detecting the smallest possible unit of the plant material, a new chemical compound. The knowledge that comes with the plant material is already filtered out during the medicinal plant claim meeting. Only information valuable for detecting new drug leads is of interest.

Nikolas Rose (2007) describes the process of extracting life – here, the social and cultural life that comes with medicinal plants – out of living beings – here, medicinal plants – as the "molecularization of life" (cf. Laplante 2014). This "molecularization of life" is part of the twenty-first century politics of "life itself" (Rose 2007: 3), which involves the translation of the "situated [local] knowledge(s)" (Antweiler 1998; Haraway 1988; Geertz 1983) of various ethnic groups, communities and individual knowledge holders into global pharmaceuticals, which leads to distinct forms of (bio)value and power regimes of global biocapital in the capitalist market (Waldby 2000, 2002; see also Foucault ([1978]/1990). In effect, the disclosed plants and knowledge are reduced to the mere scientific value of a chemical compound in order to secure "scientific facts" (Adams 2002), "efficacy" (Waldram 2000) and safety for later users; mostly, but not only, consumers of pharmaceutical products in the Global North. The food company Unilever, for instance, dropped out of further research and development of *Hoodia* products due to safety issues that were allegedly detected in products containing the chemical compound P57 extracted from the plant.

Medicinal plant material and associated knowledge are, aside from being subjected to the attempt to fuse indigenous and scientific knowledge, forced into a procedure of standardization marked by clinical trials. This procedure, which will eventually lead to the commercialization of products valuable for the global pharmaceutical market, reduces all possible values to mere biologically valuable and scientifically and economically usable facts. The production of biovalue is a scientific attempt to control the 'lack of safety' that comes with 'raw' medicine, without acknowledging the already existing knowledge of traditional healers and their epistemological and ontological background.

On the other hand, the IKS Lead Program had the task to "support and promote indigenous knowledge systems". This was primarily practiced by following up medicinal plant claims (though these did not come only from traditional healers), by inviting healers to training courses on tuberculosis, for instance, and by including them in the educational curriculum of the IKS Lead Program, e.g. as teachers for visiting school children during National Science Week. These endeavors of *integration*, however, seemed more a measure of *including* traditional healing and its practitioners into the scientific realm, of making use of them, and less about acknowledging and integrating their knowledge systems. Indeed, the cultural value of indigenous knowledge systems only played a limited a role in the scientific assignment. This was pointedly summarized by the IKS Lead Program Director, Dr. Matsabisa, when he stated "I am not interested in the spirit, I am only interested in the molecule."

The impetus behind indigenous knowledge systems being seen as having merely economic and scientific value was also politically manifested at the national level in the IKS Policy of 2004, with its aim of strengthening the contribution of indigenous knowledge to social and economic development. With the IKS Lead Program's further engagement in poverty reduction and local development projects, including the La Serena *Sutherlandia frutescens* plantation site in De Doorns, it did also contribute to rural economic development. In these projects too, however, indigenous knowledge systems only played a side role. The *Sutherlandia* plantation site, for instance, did not have much to do with indigenous knowledge systems; *Sutherlandia* is a well-known plant in South Africa and information on it can be found in commonly available botanical books and databases. George, the plantation site manager, was also not interested in indigenous knowledge; *Sutherlandia* for him was "the global solution" to health issues. Indigenous knowledge systems hardly played a role here, at least not in a deep cultural sense. The promotion of knowledge holders – traditional healers – was thus ultimately linked solely to the agendas, results and endeavors of the scientifically- and economically-aligned program.

This economic notion of (bio)value thus "overdetermines all alternative formations, as well as non-economic strata of social life" (Žižek 2004, cited in Sunder

Rajan 2006: 6). The ancestors, for instance, cannot be utilized or capitalized in a biotechnological system specialized on the extraction of commercially exploitable goods, unless a sales strategy can find a way to merchandize the spirit. The spiritual-cultural component, which is basically carved out at the laboratory door, may, for instance, be later added by a company – to a limited, marketable degree – to underline the authentic character of a pharmaceutical (i.e. *Umckaloabo*), a cosmetic (i.e. a hair shampoo with *Marula* essence) or a food supplementary product (i.e. *Hoodia* powder for dietary products). The marketing strategy for *Umckaloabo*, for instance, employs a stereotype of Africa and its ethnic groups. The webpage as well as the products are promoted with the image of people equipped with spears and shields standing under an Arcadia tree against the background of an orange-red sunset. Playing with such 'authentic' African images may provide a good marketing strategy – in the *Umckaloabo*® case, it suggests the warmth and strength of rural Africa – but this strategy does not, in the end, provide any information about the cultural background and value of the original knowledge used to make the product.

Understandably, the main interest of pharmaceutical companies or scientific research is to produce scientifically valuable results and to sell their products. Uli Feiter of Parceval frankly summarized this interest with the words, "I am a businessman, not a social worker." Both Dr. Matsabisa and Uli Feiter were open about their aspirations with regard to medicinal plants and indigenous knowledge. However, they had to conform to the (inter)national legislation of the CBD, National Biodiversity Act and the BABS regulations, and were thus forced, aside from all economic interests, into cooperations with indigenous knowledge holders. Uli Feiter in particular was deeply involved in interactions, negotiations and cooperations with local communities. These negotiations and cooperation increased his sense of understanding of the cultural and emotional value comprised in bioprospecting, which also forced them to look beyond the veil of economic interests alone.

The Comaroffs have claimed "ethno-commodities and the value they accrue remain subject in many ways to the whims of capital and the preconditions of those who profit from its circulation" (Comaroff & Comaroff 2009: 27). This may be true, "But this is much too simple" (ibid.). The 'commoditization only' suggestion sounds perhaps too much like a deterministic reduction to mere economic value. The negotiations and cooperations with healers and healers communities that Uli Feiter as well as Dr. Matsabisa evoked under the pretense of ABS agreements ultimately showed that indigenous communities, when properly included, do not have to be the mere victims of commercially-interested companies or scientifically-oriented research institutions, but, as "ethno-preneurs" with "indigenous agency" (ibid), they can also make use of the commercial interest in their tangible and intangible cultural properties. The Comaroffs hold that "ethno-preneurialism frames identity as a mode of finding selfhood through vernacular objects" (ibid.: 28). Therein "identity is increasingly claimed as property by its living heirs, who

proceed to manage it by palpably corporate means: to brand it and to sell it, even to anthropologists, in self-consciously consumable forms" (ibid.: 29).

I suggest, therefore, that economic interest may certainly be a driving motivation, but to my mind the analysis should not become trapped in reducing bioprospecting to economic and scientific interests alone. This is difficult, given that almost everything in bioprospecting, from its defined objectives – the scientific and economic utilization of genetic and biological resources – to the politics in which it is embedded – the CBD and National Biodiversity Act – propose economic incentives to be the main motivation. Therefore, the next section returns to the question posed in chapter I about how much of the suggested 'empowerment politics' transported in ABS and IPR is in fact created with the intention of making indigenous peoples ally with bioprospectors in order to ultimately feed the economic market (Takeshita 2001).

Bioporspceting: A Paradigm Beyond Mere Scientific and Economic Value

Politics may to some degree be created to make indigenous peoples ally with bioprospectors in order to feed the economic market, but this leaves out the agency that arises from the opportunities that bioprospecting politics also encompass. Leaving out indigenous peoples' agency puts them back into the colonized, marginalized and disempowered corner under the pretense of neoliberal market regimes. And indeed, indigenous peoples may be the 'victims' of economic market interests. The Masakhane community in Alice in the Eastern Cape, for instance, had to fight for their rights to continue to use the extraction method that they, and other communities in the area, had been using for centuries. If the German company Schwabe had sustained the patent on the method, the communities would have officially no longer been allowed to use it. Although dependent on the market, the community nevertheless showed forms of resistance and agency against it.

The Kukula Healers of Bushbuckridge Municipality also expressed forms of empowerment and agency that were linked to the ABS and IPR politics with which they worked, though they also had the momentum of a group of people and individuals who had deliberately decided to work for the sustainable future of their communities, independent of such external politics. Indeed, in the case of the Kukula Healers, some members were, before the association's establishment, already actively involved in environmental protection projects. Mama Rose, her husband David and some other healers had established the Vukuzenzele Medicinal Plant Nursery, while Rodney Sibuyi, Adah Mabunda and Charles Mthetwa had established a new association of healers. Political interests might have motivated their activities, but first and foremost they were interested in actively contributing to the life of their communities and the surrounding environment. Mama Rose was interested in medic-

inal plants and had realized that environmental protection is inevitably linked to traditional healing practices and the plants she needed for her practice. Hence, she established Vukuzenzele Medicinal Plant Nursery *before* the NGO Natural Justice came to know about her. Similarly active were Rodney Sibuyi, Adah Mabunda and Charles Mthethwa both dedicated healers and active members of their communities. They had also decided to form their own healers' association *before* their involvement with Natural Justice. It was only later that Natural Justice and the K2C committee introduced the idea of the BCP.

Traditional healers may appear to be disempowered in the larger, national political context, although I hold that this may be a very limited understanding of disempowerment. Most recently with the implementation of the THP Act and the IKS Policy, traditional healers have started to be active participants in national politics (Zenker 2010, 2015; Laplante 2015). In addition, local communities have their own structures and local hierarchies (Oomen 2005), in which traditional healers play an important role (Flint 2008). Healers are not per se disempowered, and yet they are still at the margins in terms of political and legal rights, power and economic influence, and still they must fight against witchcraft accusations, competition from churches and biomedical health clinics, and a young generation deeply in doubt about traditional ways of living.

Natural Justice thus encountered a group of healers who were integrated in their communities. This integration had an ambivalent connotation, however, because on the one hand they were fully accepted and active members of their communities like every other member, but on the other hand the healers were also subject to resentment, threats and witchcraft accusations, which were also expressed in the diminishing number of consulting patients over the years. Developing a BCP was therefore not only an idea imposed by Natural Justice, but also an opportunity to improve their situation as traditional healers by receiving political attention and recognition as well as local credit for cooperating with the NGO, the K2C committee, Kruger National Park or Mariepskop. The seeming decline in the healers' reputation in their communities could thus be upgraded with the impact of their cooperation with such external entities and stakeholders. This cooperation will perhaps not lead to financial income (although the cooperation with Natural Justice brought about moderate financial support for the association), but could encourage their stronger position within society. This scenario was, however, strongly linked to ABS and IPR politics and laws.

The Opportunities and Challenges of Law

The legal concept of ABS is defined in terms of the success of a product. Without a product and benefits, there can be no ABS agreement. However, ABS entails a whole set of negotiations and discussions that must take place *before* the actual

benefits can arise. In the case of the Kukula Healers and Godding and Godding, prior informed consent (PIC) and a non-disclosure agreement (NDA) were negotiated before the exchange of plant material and associated knowledge occurred. These negotiations encompassed the development of a trust relationship between the knowledge providers – the Kukula Healers – and the knowledge users – Godding & Godding and their representatives, the K2C committee.

In what the Comaroff's (2009, 2006) have defined as *lawfare* – the use of legal means for political and economic ends (Comaroff & Comraroff 2006: 30f.; see also J.L. Comaroff 2001) – communities are forced into the rhetoric of ABS and IPR politics by means of legal tools (such as PIC, NDA, MTA). Natural Justice, for instance, supported the Kukula Healers by providing legal 'education' in the form of introducing the healers to international and national ABS and IPR politics. The formation of an association as a legally accepted group, and the development of a constitution and a code of conduct/ethics, enabled the healers to structure their so far unstructured group and to access the corresponding legal rights. As an official association, which cooperated with Natural Justice and the government, the Kukula Healers also managed to gain more local recognition within their own communities, as well as from other stakeholders like Godding & Godding, Kruger National Park, the Mariepskop Nature Reserve, as well as outside groups such as the Open A.I.R. Network, the latter of which published an academic article and produced a YouTube video with and about the healers[2]. Many meetings and discussions with the healers and Natural Justice and the K2C committee brought about a deepener understanding of their political and legal requirements as a group, a group that had had little previous contact with such formal, legal structures. The PIC and NDA that they negotiated with Godding & Godding were new forms of collaboration intended as a securitization of their rights to their property. Also, as an association, ownership rights are much easier to defend within the realm of intellectual property law; the traditional knowledge (TK) commons pool that the healers developed enabled the association to hold rights over their collectively gathered knowledge, with the legal rights holder being the association. In negotiations over knowledge exchange, the healers can therefore protect their collectively held knowledge as a legally, and emotionally, united group.

As the Comaroffs wrote in *Law and Disorder in the Postcolony* (2006), *lawfare* "might also be a weapon of the weak, turning authority back on itself by commissioning courts to make claims for resources, recognition, voice, integrity, sovereignty" (Comaroff & Comaroff 2006: 145). In this sense, *lawfare* thus applies a double standard. In the case of ABS, on the one hand it replaces local customary laws of knowledge protection with enforced legal structures, while on the other it enables communities to learn about these legal structures, adapt to them and make

2 www.youtube.com/watch?v=Ve8i-akzCOk (last accessed February 15, 2019).

use of them. Law making, to cite Walter Benjamin, is power making (Benjamin 1978: 295). And thus indigenous communities may connect their identities to the legal rights attached to their property and thus accept the law as an instrument of political and legal leverage and local empowerment, brought about by NGOs such as Natural Justice and governmental institutions and departments.

In addition, in ABS negotiations and the quest for knowledge protection, customary rules of knowledge protection and new legal structures to adapt to the economic market rules of intellectual property law co-exist. The Kukula Healers did not give up their old structures of knowledge protection, and they still applied them in their daily practice as healers. However, with the TK commons pool they developed a scheme that integrated the new system, which allowed for the opening up of protected knowledge in order to pursue economic interests, into the old system, which protected knowledge against outside influences. Although neither the TK commons pool nor the BCP were legally binding tools, the knowledge held by different healers was brought within a legal framework – i.e. an "assemblage of legal practices, legal institutions, statutes, legal codes, authorities, discourses, texts, norms and forms of judgment" (Rose & Valverde 1998: 542; see also Strathern 1999) – which did the work of "interpellation in fields where rights are negotiated and collective subjects are recognized and invested with new responsibilities for managing cultural goods" (Coombe 2011: 81).

The support of NGOs to help indigenous communities understand and make use of legal tools may help them to define their rights and thus also to rise up from their politically marginalized position in society to a position where negotiation at eye level is possible in the larger community, for instance with tribal authorities like Chief Philip Mnisi, other stakeholders in the region and with external entities like national and international companies. In addition, with an association like the Kukula Healers, a new cultural subject was created, which could act and react as an agent engaged in the sustainable use of biological resources and resource management (Brosius, Tsing & Zerner 1998, 2005).

Looking at indigenous communities simply as a new entity through which to apply the messages of the CBD and other environmental and indigenous policies like the National Biodiversity Act and the IKS Policy could easily fall into the trap of romanticism, essentialism and reductionism: communities are not *per se* the 'new' solution to combat environmental degradation and cultural loss. Furthermore, they must still struggle to claim their rights to property. The example of the Kukula Healers may be an overly positive one, also because I entered into their process during a peak of positive feedback and cooperation; future perspectives had still to be developed. Additionally, a BCP does not automatically make a community independent and strong, so that it can sustain itself economically and emotionally. Breaches may happen, as occurred in other development projects (cf. Escobar 1998). Their processes may fail, or lead 'only' to 'minor successes' beyond economic benefits; for

example, a stronger political voice and the protection of the cultural identity and heritage of their communities.

Examples like that of the Kukula Healers may indeed contribute to solutions, or at least pathways, towards the preservation of cultural heritage and biodiversity, if they are not only regarded as 'close-to-nature natives' but rather as equally strong participants in political processes. The reduction of indigenous actors to 'the good native' who is passively awaiting global and national politics fails to acknowledge the movements, interests and motivations of indigenous communities beyond politically and legally imposed structures. Communities like the Kukula Healers do have economic interests, but they also have additional interests in local empowerment as well as future visions for the next generation, such as sustaining the environment and livelihood they live in. However, they are also not so naïve as to believe that their society does not change. In contrast, developing a BCP is a sign of adaptation to the changes within society, and to their positioning themselves anew within this society.

Bioprospecting as a Means of Hope

Bioprospecting evokes hopes of participating in the economic benefits that may – yet hardly ever do – result from such activities. These hopes lie not only in indigenous communities, but among other non-indigenous citizens as well. It is a somewhat "vague hope" (Crapanzano 2003: 6), which also includes disappointment and frustration. All efforts put into bioprospecting are primarily endeavors towards an (imagined) 'better future'. But on the way to this better future, a lot of activities, emotions, new configurations and assemblages come together, which may either lead to a success story or to one of the many dead-end roads of bioprospecting. Cases like the *Dicoma anomal* patent, whereby the IKS Lead Program under Dr. Matsabisa had submitted a patent claim on an antimalarial property of the plant, do occur; new associations like the Kukula Healers are formed; NGOs such as Natural Justice, the BCPs and the Nagoya Conference in 2010 have influenced international politics; and notions of property – like the exchanged plant material and associated knowledge of the Kukula Healers – have become more emotionally contested.

This positive assessment does not ignore the more negative aspects of bioprospecting, namely the ongoing yet subtler forms of biopiracy occurring among still disempowered communities. In effect, the voice of the Kukula Healers might have been heard in international, national and local forums, and yet their actual daily life situation did not change much. But, as Gino Cocchiaro from Natural Justice and Marie-Tinka Uys from the K2C committee rightly proposed, bioprospecting is about the process and the later capacity building, not about selling 'culture' to the capitalist market. In this sense, I suggest that the capitalist market may be

the initiator, the spark that lights the fire of hope, but it is not the driving factor that leads to a continuation of activities (especially when no benefits have been realized). The Kukula Healers, for instance, continued to meet and be involved in activities with local stakeholders, including representatives from Kruger National Park, until now, January 2016, as I heard from Rodney Sibuyi during a recent phone call. In the end, capacity building and the learning process of democratic and political negotiation processes might even be more important than economic benefits. Or as Coombe (2011: 93) has suggested, "the communities 'empowered' by recognition of their traditional knowledge, their tangible and cultural heritage, or their traditional cultural expression may sometimes be artifactual, but they are still emphatically real and have material and political consequences."

Future Perspectives

This book provides a new approach to the complexity of politics, economy, science, law and socio-cultural perspectives on medicinal plants and (indigenous) knowledge, which were all assembled in the field of bioprospecting in the years 2009 to 2012. By bringing together actor-network theory (ANT) with a trajectory of property and values in multiple sites and contact zones, this book offers a valuable analysis of the contestation of medicinal plants and (indigenous) knowledge in post-Apartheid South Africa. This was done less to continue building on the existing demarcation between traditional knowledge(s) and healing practices on the one hand, and scientific knowledge(s) and practices on the other, and more to highlight both the demarcation as well as the mutual dependency and interaction between the two. It has also been shown how much the production (or lack of production) of a pharmaceutical product from medicinal plants is dependent on a number of often-coincidental factors. The trajectory from nature to healers to product is disrupted by political, legal and socio-cultural constraints, which are partially annulled – or used – for new dialogues, cooperation, agency and future perspectives (such as indigenous communities becoming indigenous entrepreneurs or 'ethno-preneurs'). This is not to say that these interactions are not driven by past and present power imbalances, but that the focus shifts to a more holistic view on the mutuality and interdependence of the different human and non-human actors in the field of bioprospecting. Bioprospecting is, without question, a scientific and economic enterprise, but it would not exist without natural resources, the people using these resources, and the politics and laws that bring these resources and people together, or conversely that separate them.

The unique contribution of the present book lies in the provision of an example of how to assemble the many disrupted and yet associated human and non-human actors in the field of bioprospecting in post-Apartheid South Africa. This book could thus stand as an exemplar for similarly embedded future anthropological research

projects. Understanding the complexity and complicity of local communities, their knowledge systems, practices and materials in interaction with local, national and global institutions and organizations and their knowledge systems and practices, as well as with overarching political, economic and legal implications, may help to deal with prevalent (global and local) challenges such as climate change or health crises. Against the often repeated critique of ANT that it lacks an analytical integration of power, I rather suggest that the way in which I have used ANT in this book contributes to a better understanding of the interrelations, but also the tensions and conflicts, that accrue when human and non-human actors assemble in innovative configurations, and where 'new' and 'old' technologies, laws, politics, the economy and different actors meet.

Hence, this book may provide a methodological and theoretical framework for coming projects, where "old" and "new" technologies meet, e.g. projects like a recently promoted project at the Central University of Technology in Free State, South Africa, where engineers working on software that "mixes modern and ancient [i.e. tribal] knowledge to predict the onset of droughts"[3].

This is only one example of cooperative ventures, which seek for innovative future solutions for prevalent local, national and global environmental and/or health problems. Innovation and creativity therefore cannot and should not be viewed as a monopoly of countries of the Global North, who bring new technologies to the Global South (though intellectual property law fortifies this stance); instead, it is a question of collaborative cooperation. Questions of fair and appropriate ABS and knowledge protection beyond – or within – current intellectual property law may play an ongoing role. This book granted a first step towards understanding the correlations, interrelations and interactions of the human and non-human actors involved in the process, whereby values are produced, whose differentiation – as provided in this book– may flow into further considerations about the fair and appropriate sharing of benefits and the integration of customary rules of knowledge protection in – or beyond – intellectual property law.

3 For further information on the project, see: http://motherboard.vice.com/read/south-african-scientists-think-software-and-tribal-knowledge-can-predict-drought (last accessed February 5, 2016).

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