Chapter 6
Green Diamonds of the South: An Overview of the San-*Hoodia* Case

Rachel Wynberg and Roger Chennells

Abstract One of the most famous benefit-sharing initiatives to date is the San-*Hoodia* case. The San peoples are the oldest human inhabitants of southern Africa, but after centuries of genocide and marginalization by colonialists, they now number only about 100,000 people in Botswana, Namibia, South Africa and Angola. Their current lives are characterized by abject poverty, yet they still possess traditional knowledge about local biodiversity.

This chapter describes how San knowledge about the appetite-suppressant properties of *Hoodia* – a succulent plant used as a substitute for food and water during hunting expeditions – has led to agreements to share benefits arising from the use of this knowledge, and analyses the challenges in developing and implementing these agreements. It distils and synthesizes existing research, presents a review of new initiatives and, through the eyes of the San legal representative involved in negotiations and those of an activist and researcher monitoring developments, provides a critical analysis of the case study.

The chapter concludes that the challenges of implementation are substantial, in particular the distribution of benefits to impoverished communities in three different countries. Regional differences in benefit-sharing policies exacerbate these challenges, heightened by highly unstable *Hoodia* markets, more especially in light of the main licence holder's decision to terminate its involvement.

A crucial lesson to emerge from this case study is the need to obtain the prior informed consent of communities holding knowledge about biodiversity from the outset of a project and to engage communities as early as possible as active partners.

R. Wynberg (✉)
Environmental Evaluation Unit, University of Cape Town, Private Bag X3, Rondebosch 7701, Cape Town, South Africa
e-mail: rachel@iafrica.com

R. Chennells
Chennells Albertyn: Attorneys, Notaries and Conveyancers, 44 Alexander Street, Stellenbosch, South Africa
e-mail: scarlin@iafrica.com

R. Wynberg et al. (eds.), *Indigenous Peoples, Consent and Benefit Sharing: Lessons from the San-Hoodia Case,*

Also emphasized is the importance of relationship building and of having in place a policy climate conducive to fair deliberation. The case has resulted in heightened interest about the importance of protecting traditional knowledge and ensuring that holders of such knowledge receive fair compensation.

Keywords benefit sharing • biopiracy • Convention on Biological Diversity • *Hoodia* trade • San indigenous communities • traditional knowledge protection

6.1 Introduction

The story of *Hoodia* is one that has been told many times (Geingos and Ngakaeaja 2002; Chennells 2003; Stephenson 2003; Wynberg 2004; Vermeylen 2007). Indeed, over the past 7 years no fewer than ten documentaries have been made about the case, more than a dozen PhDs and Master's dissertations registered to investigate it further, and hundreds of news items written. The involvement of the San, the oldest human inhabitants of Africa, and the intrigue of a plant that may simultaneously tackle the Western affliction of obesity and the developmental challenges of the San have triggered the public's imagination at a time when disparities between rich and poor have never been greater. For some, the case illustrates the possibilities of bioprospecting – the search for biological material with commercially valuable genetic and biochemical properties – and final, albeit tenuous, delivery on the long-standing promises of equitable benefit sharing in the Convention on Biological Diversity (CBD). For others, it typifies the problems of biopiracy, where traditional knowledge has been appropriated without the consent of holders of that knowledge.

This chapter presents an overview of the story to date. It distils and synthesizes existing research, presents a review of new initiatives and, through the eyes of the San legal representative involved in negotiations and an activist and researcher monitoring developments, provides a critical analysis of the case study. It begins by introducing the San, with their history of devastation and current developmental context. Then follows a review of the traditional use and knowledge of *Hoodia* by indigenous peoples in southern Africa and an overview of the commercial development of the plant. The next section describes how the benefit-sharing agreement was negotiated between the San and the Council for Scientific and Industrial Research (CSIR), and the key issues of these deliberations, and is followed by a review of current trends in *Hoodia* markets and the development of a second benefit-sharing agreement. The last part analyses current implementation challenges.

6.2 The San

The San peoples of southern Africa, also known as the 'Bushmen',[1] are generally regarded as having lived longer continuously in one location than any other population in history (Stephenson 2003). They are considered to be the progenitors of the rest of humankind (Deacon and Deacon 1999; Soodyall 2006) and certainly the oldest human inhabitants of southern Africa, having lived in small nomadic groups of hunters and gatherers for thousands of years as sole occupants of the region (Boonzaier et al. 1996; Lee et al. 2002). Unequivocal remains of their ancestors excavated just outside Cape Town date back approximately 120,000 years (Lee et al. 2002).

Humankind's fascination with our origins as hunter-gatherers and with the exotic or 'primitive' has made the San an icon of popular culture, a fixture in anthropological textbooks and films, and, more recently, a subject of anthropological and political controversy. To some they represent pristine hunter-gatherers, to others apartheid's[2] most oppressed and marginalized victims, but neither of these polarities captures the present realities (Hitchcock et al. 2006).

When settlers landed at the Cape in 1652, the San occupied an area stretching from the Congo-Zambezi watershed in Central Africa to the Cape in South Africa and numbered about 300,000 people (Lee 1976). Today the San comprise approximately 100,000 people, 55,000 of whom live in Botswana, 35,000 in Namibia, 8,500 in South Africa and 4,500 in Angola, with scattered populations in Zimbabwe and Zambia (SASI 2007). After centuries of genocide and marginalization, leading to loss of land and consequently loss of culture and identity, they occupy an unchallenged niche as the poorest of the poor in these countries (Suzman 2001), living in conditions of relative powerlessness.

The so-called 'Kalahari debate' articulates two positions on understanding the current vulnerable status of the San. The first is held by the 'traditionalists', who essentially see the San as primitive hunter-gatherers, relics of our forebears who have been isolated and have lived in harmony with nature, with a relatively resilient and static culture, until recent times (Wilmsen 1989). The 'revisionists', on the other hand, declare the San peoples to be an impoverished underclass, victims of an unrelenting class war against a host of more dominant peoples (Barnard 1996).

---

[1] The word 'San' was first used by the Harvard Kalahari Research Group as a replacement for the term 'Bushmen' in 1961 (Lee 1976). Whilst other terms are used in various contexts, for example 'Basarwa' in Botswana and 'Bushmen' by many including the San themselves, San leaders have agreed that the word 'San' is the only known overarching term that describes their peoples (Hitchcock et al. 2006).

[2] Meaning 'separateness' in Afrikaans, apartheid was a system of racial segegation in South Africa from 1948, and was dismantled in a series of negotiations from 1990 to 1993. These negotiations culminated in democratic elections in 1994.

Today, whilst a minority of San live in villages on their own land,[3] most reside in conditions of abject poverty on land to which they have no rights or traditional claim. Living in small rural villages in regions dominated by more powerful African cultures, in sterile government resettlement villages, or as labourers working on commercial ranches, they occupy an uneasy twilight zone between their former traditional ways and the modern world. A regional assessment of the status of the San concluded that despite decades of development assistance, they remain by far the most marginalized and dispossessed of all southern African communities (Suzman 2001).

Their former egalitarian and consensus-based hunter-gather lifestyles have had to adapt to rapid sedentarization, with predictable consequences. In common with other First Nations[4] elsewhere in the world, the San have to a large extent succumbed to societal breakdown and culture loss exacerbated by alcohol abuse and hopelessness (Silvain 2006). Representational leadership gives rise to the formation of new elites, with the concomitant jealousies and power struggles associated with modern political and social life. Some authors have suggested that it is the hunter-gather legacy that leaves societies such as the San with comparatively low capacity for bettering themselves materially (Diamond 1998). Others regard the consensual nature of decision-making in nomadic non-hierarchical societies as being central to their continued powerlessness (Colchester 2003).

The burden of the relatively recent genocidal predations on the San deserves mention. The collective trauma inflicted upon indigenous populations by colonial invasions has been remarkably similar, from the Americas to Australasia to Africa. Superior weaponry devastated entire populations, and the convenient *terra nullius*[5] doctrine gave comfort to governments responsible for atrocities committed in their name. Genocide of San peoples was rationalized as rightful retaliation against their theft of cattle, as imposing law and order on a 'lawless land' and clearing farming land of 'vagrant and treacherous savages'. *The Times* of London described the San as 'in appearance … little above the monkey tribe, and scarcely better than the mere brutes of the field' (*History of the Bosjesmans, or Bush People*, 1847).

Penn's (1996) description of the systematic destruction of the Cape San by the authorities is breathtaking in its horror. The Cape colonial government was driven by a conviction that the San, being incompatible with the creation of a 'civilized society', needed to be eradicated. During the eighteenth century thousands of San were systematically exterminated by hunting parties, and their women and children taken into servitude. The following extract from Theal (1892–1919) is a fitting summary of this sad and recent history.

---

[3] Some 4,000 !Kung of the N=a Jaqna conservancy (formerly West Bushmanland) in Namibia, 5,000 Jun/uasi of the Nyae Nyae (formerly East Bushmanland) in Namibia and 800 ≠Khomani San of the Northern Cape, South Africa, have secured rights to live on their traditional land.

[4] 'First Nations' and 'First Peoples' are terms colloquially given to certain peoples, such as the Aboriginals of Australasia, the Inuits of Canada and the San of southern Africa, who inhabited their continents many millennia before the advent of subsequent colonizers.

[5] This doctrine of colonial empires held that land occupied by indigenous or local peoples, who did not maintain a recognized system of 'ownership' of the land, was in fact empty land and thus open to occupation by the civilizing invaders.

> They [the San] could not adapt themselves to their new environment, they tried to live as their predecessors had lived, and therefore they were fated to perish. The wave of European colonisation was not to be stayed from rolling on by a group of savages who stood in its course.

The exhibition *Miscast* at the South African National Gallery (Skotnes 1996) shocked the world with photographs of dead San men and women hanging from trees after hunting parties, trophy heads and San body parts preserved for scientific research. The exhibition provided a shocking visual reminder of the sustained, merciless and unspeakable carnage wreaked on generations of San in the name of 'civilization'. San visitors to the museum, despite being aware of their history of subjugation, were equally horrified at the starkness of the visual record and reminder of their desolate past.

The San population today bears the scars of this devastating history. A number of dedicated non-governmental organizations (NGOs), collectively known as the Kuru Family of Organisations, that have evolved over the past 2 decades are grappling with the challenge of bringing appropriate development for the San (KFO 2006) (see also, Chennells et al. Chapter 9). In 1996, taking a leaf from the book of the Sami indigenous peoples of the Scandinavian north, the San formed their own advocacy organization, the Working Group of Indigenous Minorities in Southern Africa (WIMSA), charged with uniting and representing San communities from Botswana, Namibia and South Africa. San leaders in WIMSA ensured that their cultural and linguistic diversity was celebrated under a collective San cultural umbrella, which proved decisive in their aim to achieve San unity across national boundaries. As these organizations have developed, the capacity of the associated San employees and leaders to determine their own future has steadily risen. Chennells et al. (Chapter 9) describe the role played by these San organizations in San development and Vermeylen (Chapter 8) examines the degree to which San have achieved rights, both to their intellectual property and to their land.

6.3 Traditional Use and Knowledge of *Hoodia* Species

Use of *Hoodia* by the San probably dates back centuries, but the first recorded use of the plant was in all likelihood by the botanist Francis Masson (1741–1805), who visited the Cape from 1772 to 1774 and 1786 to 1795. He recorded finding 'Stapelia gordoni' (now called *H. gordonii*) (Masson 1796) and wrote that the stems of *Trichocaulon piliferum* were eaten by the 'Hottentots'. 'This is the real ghaap[6] of the natives,' wrote the South African naturalist Rudolf Marloth (1855–1931) of *T. piliferum*, 'who use it as a substitute for food and water. The sweet sap reminds one of licorice and, when on one occasion thirst compelled me to follow the example of my Hottentot guide, it saved further suffering and removed the pangs of hunger so efficiently that I could not eat anything for a day after having reached the camp' (Marloth 1932).

[6] A vernacular name for *Hoodia* and *Trichocaulon* species.

Who are the 'Hottentots' referred to by Masson, and how do they relate to the San earlier described? And what claim do they now have to knowledge about the properties of the plant? Strictly speaking, the 'Hottentots', or Khoe peoples, were herders who were related to the San, but this distinction is not recognized in the colonial botanical accounts, which cluster all groups as 'Hottentots', including the San.

The groups presumably used *Hoodia* for millennia, although the ways in which they did so are open to interpretation. A popular but perhaps simplistic account has the San using the plant for hunting purposes to give 'strength', and anecdotal accounts even suggest that hunters may have been given *Hoodia* to prevent their eating the kill. But San informants suggest that this would have been insulting to the hunter, whose skills and integrity negated the need for any external appetite suppressants.

What is undisputed, however, is use by the San of *Hoodia* and related species as a food and, especially, as a drink substitute and appetite suppressant, as well as for other purposes recounted variously as to improve virility; to cure or treat hangovers, haemorrhoids, high blood pressure, pulmonary tuberculosis, stomach pains, flu, asthma and eye pain; and, ironically, to stimulate the appetite (Watt and Breyer-Brandwijk 1962; Khoisis 1983; Dicks et al. as quoted in Van Wyk and Gericke 2000; Hargreaves and Turner 2002). Typically, such treatments would be prepared by scraping the spines off the succulent stems with a stone or stick and then eating the stem raw like a cucumber. It could also be cooked, to reduce the bitterness, or ground into a powder for treating certain ailments. In Botswana, Hargreaves and Turner (2002) note the use of *H. currorii* (known locally as *sekopane*) for purification after death and as part of a ritual to find the cause of death. *Hoodia* species are also mixed with various bulbs to wash the body to remove bad luck. A similar recipe promotes fertility in cattle. A variety of *Hoodia* species are also used in Botswana to increase crop yields, to prevent the sun from burning seedlings and to treat venereal diseases (Hargreaves and Turner 2002).

Some of these uses can undoubtedly be attributed exclusively and originally to the San, but the wide distribution of certain *Hoodia* species suggests extensive use by many other indigenous peoples in the region, including minority groups known as the Nama, Damara, and Topnaar in Namibia, both as a medicinal remedy and as a substitute for food and water. These Khoi-speaking peoples emerged in southern Africa many millennia after the San, occupied similar geographical regions and no doubt acquired San knowledge of plants and their uses, in addition to evolving their own knowledge. Steyn and du Pisani (1985) report use of *Hoodia* species by the Damara as a source of water. Van den Eynden et al. (1992) similarly indicate use of *H. currorii* as a thirst-quencher and medicinal remedy by the Topnaar of the Kuiseb Valley in Namibia. Among the Namibian Damara, reports Von Koenen (2001), *H. currorii* is known as a diabetes remedy, with a 'piece the length of a pencil cut off every day and one third eaten morning, noon and night', knowledge that has subsequently led to the filing of an

international patent for the prevention and treatment of diabetes based on *Hoodia* species (EP1166792).

6.4 Research and Development of *Hoodia* for Commercial Application

The documented use of *Hoodia* species as a food and water substitute in colonial botanical accounts (Marloth 1932; White and Sloane 1937) is significant because it led directly to the CSIR, a South African research institution, including the plant for investigation in a 1963 project on edible wild plants of the region. A 1962 publication on medicinal and poisonous plants of southern Africa (Watt and Breyer-Brandwijk 1962) had inspired the CSIR project, which aimed to inform the South African Defence Force about the toxic and nutritional properties of wild foods and so ascertain their suitability for the army. Existing literature, combined with laboratory tests on mice which had been fed *Hoodia* species, led scientists to identify the potential of *Hoodia* species as a non-toxic appetite suppressant, although insufficient evidence existed to file for a patent. The lack of technology to isolate and identify active ingredients halted progress on the research, which commenced again in the early 1980s.

In 1986, the CSIR acquired high-field nuclear magnetic resonance spectroscopy equipment that made it possible to elucidate relevant molecular structures of *Hoodia* species (CSIR 2001), and in 1995, following 9 years of confidential development, a patent application was filed in South Africa by the CSIR for the use of the active components of the plant which were responsible for suppressing appetite (South African Patent No 983170).

In 1998, the CSIR signed a licensing agreement for the further development and commercialization of the product with Phytopharm, a small British company specializing in the development of phytomedicines (Phytopharm 1997), and this was followed in the same year by the granting of international patents in some countries (GB2338235 and WO9846243A2). The agreement granted Phytopharm an exclusive worldwide licence to manufacture and market *Hoodia*-related products and to exploit any other part of the CSIR's intellectual property rights (IPRs) relating to *Hoodia* species. Through a programme dubbed 'P57', Phytopharm developed this drug lead to a more advanced stage, leading to a licence and royalty agreement in August 1998 with Pfizer, the US-based pharmaceutical giant, for further development and commercialization.

In December 2001, Phase IIa/third-stage proof-of-principle clinical trials were reported to have been successfully completed in a double-blind, placebo-controlled clinical study, taking the drug one step closer to being commercially available (Phytopharm 2001). According to Phytopharm, the trials, which involved 18 overweight

but healthy males, provided strong statistical evidence that the plant extract reduced daily calorie intake by an average of 1,000 cal.

In July 2002, Phytopharm announced a future development programme for P57, in which Pfizer would take responsibility for developing a botanical prescription pharmaceutical for the treatment of obesity and metabolic disorder, and Phytopharm would develop semi-synthetic versions of the active molecules and be free to seek other partners to commercialize these products (Phytopharm 2002).

During July 2003, Pfizer merged with Pharmacia and closed its Natureceuticals group, which had been responsible for the development of P57. This, combined with a variety of complex but poorly understood factors, led Pfizer to announce it was discontinuing clinical development of the drug and was returning the licensing rights to Phytopharm, leaving Phytopharm free to license P57 to other parties (Phytopharm 2003). Following the closure of the Natureceuticals group, Pfizer decided that the successful development and commercialization of P57 might 'be best achieved by another organisation'. Pfizer also stated that the positive clinical trial data of P57 encouraged further study of *Hoodia* as a therapy for obesity. Some critics saw the withdrawal of Pfizer from the development of *Hoodia* as the death knell for its commercialization, but Phytopharm and the CSIR remained confident of the possibility of finding other partners to take the project forward.

In December 2004, this optimism was borne out through the granting by Phytopharm of an exclusive global licence to consumer giant Unilever plc for *Hoodia gordonii* extracts, with their likely incorporation into existing food brands as a functional weight-loss product for the mass market (Phytopharm 2004). In terms of the agreement, Unilever would buy exclusive rights to the product for an initial £6.5 million, rising to £21 million once it had achieved certain milestones. Phytopharm would also receive an undisclosed royalty on sales of all products containing the extract. Through what was described by Phytopharm's then chief executive, Richard Dixey, as an 'aggressive programme', Unilever and Phytopharm would collaborate on a five-stage research and development programme of safety and efficacy studies, and Unilever would also take responsibility for the scaling up of agronomic capacity, through an expansion of cultivation efforts in both South Africa and Namibia (Dixey 2004). Unilever would lead the marketing of products, expected to be the factor that would 'win the day' (Dixey 2004). Consideration would also continue to be given to the possibility of developing an over-the-counter pharmaceutical product (Dixey 2004).

Many of these pronouncements were realized between 2004 and 2008 and developments reached an advanced stage, including clinical safety trials, manufacturing and the cultivation of some 300 ha of *Hoodia gordonii* in South Africa and Namibia (K. Povey, October 2007, Unilever, personal communication). Agreement was also reached between Unilever and the chemical company Cognis to develop a R750 million (US$94 million) extraction facility for *Hoodia* in the Western Cape province, South Africa (Department of Trade and Industry 2008). Unilever had plans to develop a *Hoodia*-based product for its line of Slim Fast® beverages, and submission to the US Food and Drug Administration for generally recognized as safe (GRAS) status was predicted for late 2009 for the use of *Hoodia* preparations

as an additive in foods and beverages (Stafford 2009). This situation changed significantly in November, 2008, with the announcement by Unilever that it was to abandon plans to develop *Hoodia* as a functional food, because of safety and efficacy concerns (Douglas 2008; Phytopharm 2008). In further communication to South African government departments, Unilever announced that it would cease all 'drying, transport, trials and any other activity associated with *Hoodia* in South Africa' as from 31 March 2009, and that Phytopharm plc would take over a proportion of existing cultivation in South Africa and, to a limited extent, Namibia (Phytopharm 2009; Unilever 2009). Phytopharm in turn announced that it would now seek other partners to further develop *Hoodia* and bring products to market (Phytopharm 2008) and that it 'remained positive about opportunities for future commercialisation' (Phytopharm 2009).

Much is at stake if a successful product is developed: the global value of functional foods, defined as 'any modified food or food ingredient that may provide a health benefit beyond the traditional nutrients it contains' (Bloch and Thomson 1995) is estimated at US$65 billion (Phytopharm 2007), with the market value for the dietary control of obesity at over US$3 billion per annum in the United States alone (Phytopharm 2003). The growth potential of functional foods is predicted to be 50% from 2005 to 2010, with an accelerating trend towards new products.

Figure 6.1 graphically depicts the license agreements developed between the CSIR, Phytopharm and Unilever, and the benefit-sharing agreement between the CSIR and the San, discussed below in Section 6.5. A chronology of the use and commercial development of *Hoodia* follows in Table 6.1.

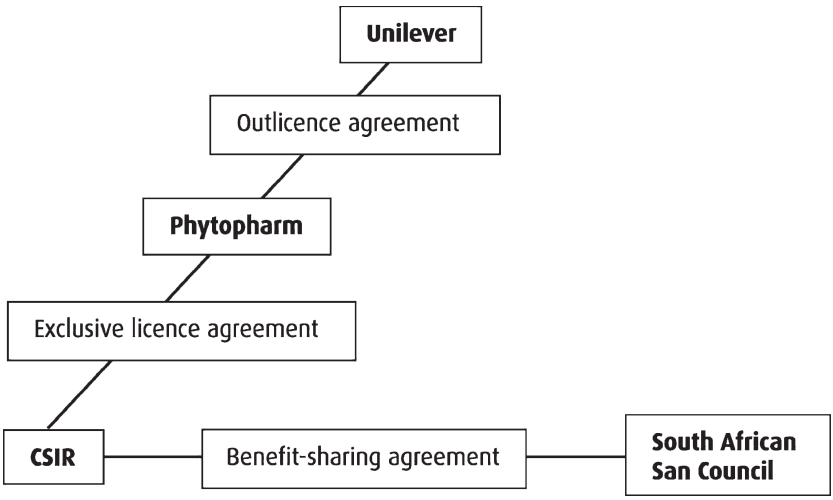

Fig. 6.1 Licence and Benefit-Sharing Agreements Developed Between the San, CSIR, Phytopharm and Unilever

Table 6.1 Chronology of the Commercial Development of *Hoodia*

C 25 000 BC to seventeenth century	The San use wild plants, including *Hoodia*, in a hunting and gathering economy
2000 BC	The earliest evidence of migration into southern Africa of pastoralists, regarded as ancestors of contemporary Khoi people (e.g. Nama, Griqua, Damara, Koranna), is from this period
AD 200 to AD 1200	Bantu-speaking (African) peoples, ancestors of southern Africa's majority populations (e.g. Zulu, Xhosa, Tswana, Herero, Ovambo), migrate south of the Zambezi River
AD 1200 to present	Extensive cultural and trade interaction, and some intermarriage, takes place between Bantu, Khoi and San peoples
1652–1900	Dutch settlers land at the Cape in 1652. The process of colonial settlement and subjugation of local tribes commences. Legalized hunting and extermination of San and Khoi peoples takes place as Afrikaner boers (farmers) drive their stock northwards and 'tame' the hinterland
1796	Use of *Hoodia* species by the 'Hottentots' is first recorded by the botanist Francis Masson
1910	The Union of South Africa is formed as a self-governing colony within the British Commonwealth
1937	The first publication of San traditional knowledge relating to the use of *Hoodia* for suppressing appetite, based on work by the German-born ethnobotanist Rudolf Marloth, appears
1945	The CSIR is established as South Africa's premier scientific research and development institute
1949	The Afrikaner-based National Party wins the election in South Africa and begins to enforce apartheid policies. San are forced to assimilate with the so-called coloureds, or people of mixed race
1955	The Population Registration Act is promulgated, forcing all indigenous people of colour to register either as Bantu or Coloured, thereby eliminating recognition of the San by government
1963	The CSIR includes *Hoodia* species in a project on edible wild plants, based on the ethnobotany of the San
1968	The death of a leading scientist on the *Hoodia* project and technical problems lead to the mothballing of the project
1983–1986	The acquisition of high-field nuclear magnetic resonance spectroscopy equipment allows for the relevant molecular structures of *Hoodia* species to be elucidated by the CSIR
1986–1995	The CSIR continues confidential work on the development of *Hoodia* species
1995	The CSIR files a patent application in South Africa for active components of *Hoodia* species responsible for suppressing appetite (South African Patent No 983170)
August 1998	CSIR and Phytopharm sign a licence agreement for the further development and commercialization of *Hoodia*, which they code-name Programme 57 (P57)
1998	International patents are granted to the CSIR in some territories (GB2338235 and WO9846243A2). Phytopharm sublicenses Pfizer to complete clinical development, obtain regulatory approval and commercialize the drug. The CSIR publishes its Bioprospecting Policy, declaring its commitment to sharing benefits with holders of traditional knowledge. However, in practice, this commitment is not implemented in the P57 project

(continued)

Table 6.1 (continued)

2001	Phase IIa/third-stage proof-of-principle clinical trials for P57 are reported to be successfully completed. WIMSA passes a resolution at its annual general meeting that heritage is indivisible and that all benefits received from the shared San heritage are to be divided amongst all San in the region
June 2001	Through lobbying work by Biowatch and Action Aid, the British *Observer* newspaper reports commercial development of *Hoodia* without the involvement of the San and quotes Phytopharm's chief executive as stating that the CSIR had led him to believe that the San were 'extinct'. The San establish that a patent has been registered based on *Hoodia* use, and that the CSIR has granted Phytopharm a licence to exploit the patent. The San inform the CSIR through their lawyer that they intend to demand their legal intellectual property rights
June 2001 to March 2002	The South African San Council is mandated by WIMSA to negotiate with the CSIR, and negotiations between the CSIR and the San commence
March 2002	A memorandum of understanding is signed between the CSIR and the South African San Council, recognizing the San as the originators of knowledge about *Hoodia* and including a commitment to benefit sharing
February 2002 to March 2003	Negotiations continue between the CSIR and the South African San Council. Workshops are held with San leaders to debate issues relating to *Hoodia* and intellectual property and to agree on principles of benefit sharing, including confirmation of the collective ownership of heritage by all San
March 2003	The CSIR (represented by the Minister of Arts, Culture, Science and Technology) and the South African San Council sign a benefit-sharing agreement. The San are to receive 6% of CSIR royalties and 8% of milestone payments
July 2003	Pfizer withdraws from commercial development of P57 and returns the licensing rights to Phytopharm
2001–2004	In parallel to the CSIR-Phytopharm initiative, a growing market develops for *Hoodia* in herbal and dietary supplements, using knowledge of the San to promote products. Some products are later revealed to be fakes, with no *Hoodia* content
October 2003	The San meet in Upington to discuss benefit sharing and decide on allocations between San councils in each country and WIMSA
2004	Phytopharm announces its intention to develop P57 as a food supplement
May 2004	A proposal is tabled to list *Hoodia* species in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), to allow for controlled commercial trade (CITES 2004)
June 2004	Namibia announces its intention to commercialize *Hoodia*
August 2004	The San apply for registration of the San *Hoodia* Benefit-Sharing Trust
September 2004	The National Environmental Management: Biodiversity Act 10 of 2004 (Biodiversity Act) is promulgated in South Africa, requiring a benefit-sharing agreement to be developed with holders of traditional knowledge where their knowledge is used for bioprospecting
October 2004	A proposal to list *Hoodia* species in CITES Appendix II is adopted by the 13th Conference of the Parties to CITES. The CSIR announces the initiation of a broader bioprospecting project with the San
December 2004	Phytopharm grants consumer giant Unilever an exclusive global licence to *Hoodia gordonii* extracts for incorporation into existing food brands
February 2005	The San-*Hoodia* Benefit-Sharing Trust is elected, formed and registered. First payments are made. Continued efforts are made to develop the capacity of the trust to manage anticipated payments to San councils

(continued)

Table 6.1 (continued)

December 2005	The *Hoodia* Growers Association of Namibia is launched
February 2006	The San, through WIMSA, enter into a benefit-sharing agreement with the South African *Hoodia* Growers (Pty) Limited (SAHG) which entitles the San to 6% of farmgate sales of raw *Hoodia*
March 2006–2007	Negotiations commence between the San, the Cape Ethno-botanical Growers Association (CEGA), the SAHG and environment departments of the Northern Cape and Western Cape provinces
January 2007	Unilever begins growing *Hoodia* in Namibia
January 2007	A memorandum of understanding is signed between WIMSA, CEGA and SAHG, with the involvement of the Western Cape and Northern Cape provincial governments
February 2007	Threatened or Protected Species Regulations are promulgated in South Africa under the Biodiversity Act. *Hoodia gordonii* and *H. currorii* are listed as protected species
March 2007	A benefit-sharing agreement is signed between WIMSA and the Southern African *Hoodia* Growers Association (SAHGA), with the approval of the South African government. The San are to receive R24 per dry kg of *Hoodia*
March 2007	Draft regulations on access and benefit sharing are tabled by the South African government in terms of the Biodiversity Act
July 2007	South Africa, Namibia and Botswana agree to prohibit the export of live *Hoodia* material from the region
September 2007	Phytopharm announces that stage 3 activities of the joint development agreement for *Hoodia* extract with Unilever have been initiated
October 2007	The US Federal Trade Commission initiates action against *Hoodia* e-mail spammers
2007	A Cabinet Directive establishes an Interim Bioprospecting Committee in Namibia
May 2008	Plans are uncovered for Cognis to build an R750 million extraction facility in southern Africa for *Hoodia*
April 2008	Bioprospecting, Access and Benefit-Sharing Regulations under the Biodiversity Act (10 of 2004) come into effect in South Africa requiring a benefit-sharing agreement in all cases where traditional knowledge is associated with an indigenous biological resource
14 November 2008	Unilever announces its withdrawal from the *Hoodia* project
31 March 2009	Unilever ceases all *Hoodia*-related operations and Phytopharm takes over a limited number of cultivation initiatives

6.5 Negotiating a Benefit-Sharing Agreement with the CSIR

6.5.1 Initiating Talks

What did these developments mean for the San, the original holders of knowledge about the properties of *Hoodia*? Up until 2001, agreements for the further development and commercialization of the *Hoodia* drug had proceeded apace without acknowledgement of the contribution of the San, let alone their prior

informed consent. Indeed a newspaper report quotes Phytopharm's Richard Dixey as having been told by the CSIR that the 100,000 strong San 'no longer existed' (Barnett 2001). In defence of its position, the CSIR linked its initial reluctance to engage with the San to a concern that expectations would be raised with promises that could not be met and insisted that the organizational policy on bioprospecting was to eventually share benefits of research based on indigenous knowledge. But clearly, the realities of implementing this policy were complex and difficult. How, it was argued by the CSIR and Phytopharm, could the real owners of traditional knowledge be identified, and what if one group had historically stolen the knowledge from another group? The potential scenarios seemed endless and intricate.

While these concerns were undoubtedly valid and are common in such cases, they were also obfuscatory and to some extent provided a useful defence for the CSIR and Phytopharm. Such sentiments were also in flagrant disregard of the International Labour Organization's Convention 169, an international agreement for the protection of indigenous peoples' rights; the letter and spirit of the CBD; the African Union's Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources (Ekpere 2001); and the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization, a voluntary guide to assist governments in developing an access and benefit-sharing strategy, as well as necessary legal, administrative or policy measures (CBD 2002). Although not stated in quite so many words by the San, who to a large degree remain on the fringes of international indigenous peoples' movements, they also ignored numerous indigenous peoples' declarations and statements that explicitly refer to the importance of obtaining prior informed consent from holders of traditional knowledge before commercialization of this knowledge and the need to ensure that benefits derived from commercialization are equitably shared with them (see Dutfield 2002 for a review of such statements).

In June 2001, the situation changed dramatically. Ongoing vigilance by a South African-based NGO, Biowatch South Africa, assisted by the international NGO Action Aid, alerted the foreign media to the potentially exploitative nature of the CSIR-Phytopharm agreement, and a British newspaper, *The Observer*, published a leading story about the case (Barnett 2001). This was not the first time that news about the patent had been made public (e.g. *Cape Times* 1997; CSIR 1999), but the international news coverage catalysed action on the case, heightened interest in links between patents, traditional knowledge and benefit sharing, and led to pressure for a rapid response on the part of both the San and the CSIR.

Ironically, the CSIR's failure to consult with the San prior to the patent application considerably strengthened the bargaining and political leverage of the San, who, having secured the moral high ground, now had a high-profile case being followed keenly throughout the world. By contrasting images of emaciated San and obese Westerners and reinforcing popular notions of 'biopiracy' on the part of large pharmaceutical companies, the media captured the public's imagination and embarrassed the CSIR and Phytopharm, and this in turn encouraged the CSIR to enter into high-level negotiations with the San.

For the San, the following three organizations played significant roles throughout the case:

- WIMSA, the San networking and advocacy organization established in 1996 at the request of San groups in the region to lobby for San rights
- The South African San Council, a voluntary association established as part of WIMSA by the three San communities of South Africa (the ≠Khomani, !Xun and Khwe) in November 2001
- The Cape Town-based South African San Institute (SASI), a San service NGO helping San-based organizations access funding and expertise

As a South African state institution, the CSIR was reluctant to negotiate with parties outside the country, so, through WIMSA, the South African San Council was formally mandated to represent the San of Namibia and Botswana as well as those in South Africa in all benefit-sharing negotiations about *Hoodia*. This arrangement recognized the fact that knowledge about the plant crossed national borders, and that the details of sharing benefits among San in different countries needed further consideration. WIMSA and SASI instructed their lawyer to negotiate with the CSIR on behalf of the San, and discussions between the two parties began in earnest.

Early on in the negotiations, the San faced a difficult choice. Should they oppose or even challenge the patent, based on ethical considerations and lack of novelty (the legal argument that the product was not a new invention), or should they adopt a more practical approach and actively negotiate a share of the royalties? This was a critical moral dilemma. As described by Vermeylen in Chapter 10, the sharing of knowledge is a culture-defining attribute of communities such as the San and basic to their way of life. Traditional knowledge of plants is viewed as collective and the idea of 'owning' life is abhorrent. The patenting of active compounds of *Hoodia* by the CSIR ran counter to this belief, yet brought with it lucrative opportunities.

Ultimately, however, the principle of 'no patents on life' was considered 'too expensive' (Chennells 2003) and the poverty-stricken San opted for a share of royalties. Writing to the CSIR president in 2001, the San lawyers stated that a legal challenge of any nature did 'not form part of our clients' plans', but emphasized that the San looked on their traditional knowledge regarding *Hoodia*, as well as other plant uses, as collective San intellectual property that it should not morally be possible for any individual or entity to own (Chennells 2001).[7]

6.5.2 Reaching a Memorandum of Understanding

In February 2002, three months after the formal commencement of negotiations, a memorandum of understanding was reached between the CSIR and the South African San Council including the following key aspects.

[7] Of interest is the subsequent appeal against the patent by the European Patent Office, on the basis of it lacking novelty and being based on prior art. The appeal was subsequently overturned.

- The CSIR acknowledged that the San were the 'custodians of an ancient body of traditional knowledge and cultural values, related inter alia to human uses of the *Hoodia* plant', and that such knowledge pre-dated scientific knowledge developed by Western civilization over the past century.
- The CSIR committed itself to recognizing the role of indigenous peoples as custodians of their own knowledge, innovations and practices, and to providing for fair and equitable benefit sharing.
- The San acknowledged and accepted the CSIR's explanation of the 'context' in which it first registered the P57 patent, without having first engaged the San in negotiations with respect to material transfer, information transfer and associated benefit sharing.
- The CSIR recognized the San as originators of the body of traditional knowledge associated with human uses of *Hoodia*.
- Any intellectual property arising from the traditional use of *Hoodia* and related to the CSIR patents for P57 remained vested exclusively with the CSIR. The South African San Council had no right to claim any co-ownership of the patents or products derived from the patents.
- The CSIR and the San committed themselves to negotiating in good faith in order to arrive at a comprehensive benefit-sharing agreement.

The parties agreed to disclose fully to each other any 'matters of significance' relating to the agreement, and that all relevant disclosable information held by the CSIR relating to the P57 patent and subsequent licensing agreements would be made available to the San.

An additional understanding considered the San and the CSIR to be the primary parties with regard to benefit sharing. This point is especially significant because it effectively excluded other groups – genuine or opportunist – from claiming benefits through prior knowledge about *Hoodia.* While this helped to address concerns expressed earlier by the CSIR and Phytopharm regarding the need to identify genuine holders of traditional knowledge about the plant, it also raised new concerns from some commentators about excluding non-San groups, such as the Nama, Damara and Topnaar, who historically occupied, and still occupy, areas where *Hoodia* grows, and undoubtedly used the plant as a medicinal remedy and as a food and water substitute.

6.5.3 Developing Positions and Identifying Key Issues of Concern

While the memorandum of understanding represented an important first step, a concrete benefit-sharing agreement was still some way off. At a series of CSIR-funded workshops and meetings, representatives of the San, the CSIR and, in some cases, government departments and NGOs were brought together to further articulate concerns and positions (e.g. Spies 2002). Key issues arising from these discussions focused on three main themes:

1. Building trust between the parties
2. Identifying genuine holders of traditional knowledge about *Hoodia* and potential beneficiaries
3. Ensuring the broader protection and promotion of San cultures and knowledge

6.5.3.1 Building Trust

The development of trust between the CSIR and the San emerged initially as a major concern (e.g. Spies 2002), more especially given the CSIR's history as an institution shaped by the apartheid regime and serving the interests of a repressive government for nearly 40 years. While transformation of this state institution is now well under way, its initial inertia in drawing the San into the project created mistrust and negative impressions amongst the San: how could they be sure that they would receive appropriate royalties and other benefits, and access to all the necessary information? At an early stage in the negotiations the South African San Council referred in writing to the CSIR's alleged collusion with the apartheid regime as a potential problem in building trust. This outraged the CSIR board, but the frank exchanges that ensued cleared the air and enabled the parties to develop a more trusting relationship as they moved towards a final agreement (Chennells 2004).

6.5.3.2 Identifying Holders of Traditional Knowledge and Beneficiaries

The San immediately commenced a process amongst communities represented by WIMSA to establish the extent to which *Hoodia* was known and used. Responses from far-flung communities in South Africa, Namibia and Botswana confirmed published records that *Hoodia*, known as *!Xhoba* to the San, was still well known and used for a number of purposes, chiefly as a sustaining veld[8] food that also reduced hunger and thirst (R. Chennells, private notes). Some informants advised against feeding the plant to small children for sustained periods, but otherwise it was confirmed to have a safe and ancient history. This bolstered the belief of the San, as the first peoples on the subcontinent, that their traditional knowledge of *Hoodia* predated that of pastoralists who had subsequently entered and settled in Southern Africa. The San view was that they had shared knowledge with all subsequent migratory groups and were thus the primary holders of traditional knowledge relating to *Hoodia*.

Despite this opinion, parties were anxious about the conflict that could arise between the San and other groups such as the Nama and Damara. Because both the plant and traditional knowledge about its use extend across Namibia, South Africa and Botswana, this matter was potentially especially complex and fraught. How

[8]An Afrikaans word meaning 'uncultivated lands or grassland'.

could a system be created that ensured fairness and equity across three countries and among the relatively new organizational structures set up by different San groups in those countries?

The restricted distribution of *Hoodia* suggested that not all San groups had utilized the plant within living memory (Fig. 6.2). But identifying groups that did have a clear record of historical use was near impossible, given the San's background of resettlement and dislocation over millennia, and also the manner in which the San have moved about the landscape over the centuries, aggregating and dispersing according to season and resource availability (Hitchcock and Biesele 2001). Moreover, thousands of people in southern Africa claim San descent and a recent history of using *Hoodia.* Knowledge about the appetite-suppressant properties of *Hoodia* is shared among a broad spectrum of communities in the region, including the Nama, Damara and other Khoe-speaking peoples, who share their linguistic roots with the San and have suffered a similar history of persecution and marginalization.

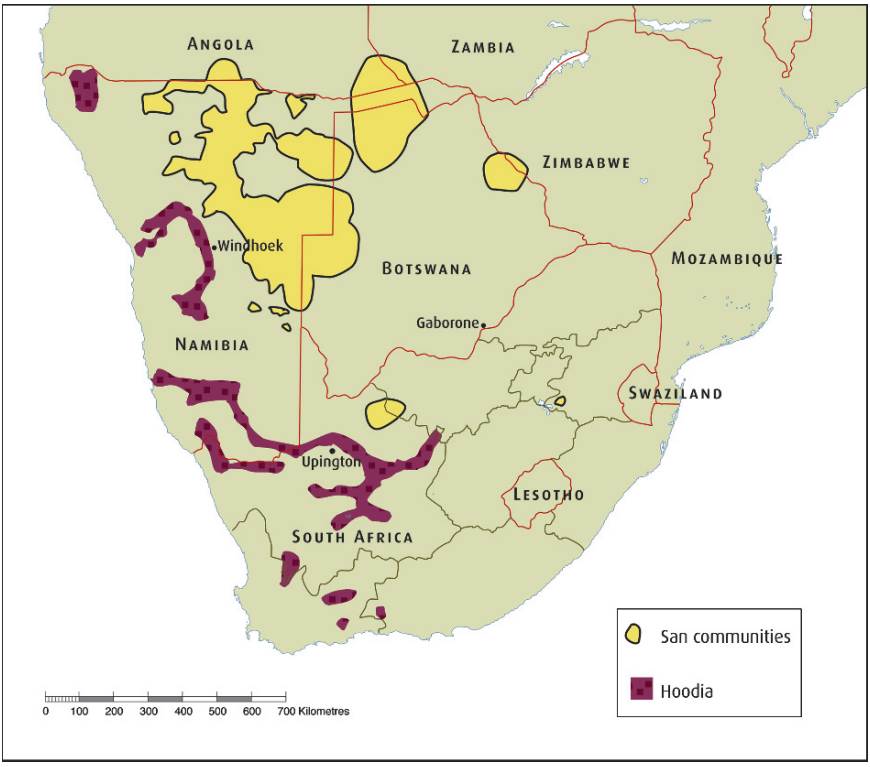

Fig. 6.2 The Distribution of *Hoodia* Species and Occurrence of the San in Southern Africa (Sources: *Hoodia* distribution from data provided by the National Herbarium Pretoria Computerised Information System PRECIS (South African National Biodiversity Institute); San data from Suzman (2001), http://www.san.org.za; after Wynberg (2006))

Resolving these uncertainties was difficult, but there was agreement amongst the San that a nit-picking exercise to link benefit sharing to specific communities using *Hoodia* would be futile and potentially divisive. WIMSA took a binding decision at an annual general meeting in 2001, after years of discussions, to the effect that heritage was indivisible, and that benefits resulting from shared heritage, such as *Hoodia*, should thus be shared equally amongst all San peoples. This decision led to a formula, arrived at collectively by the San during the negotiation process, for the equal division of financial benefits among the countries that WIMSA represented.

6.5.3.3 Protecting San Culture and Knowledge

More generally, the San sought further clarity about how they could more effectively protect their cultural heritage, including their world-renowned rock art, as well as their rich ethnobotanical and environmental knowledge. In the years preceding the benefit-sharing agreement, the San-affiliated NGO SASI had begun to assist WIMSA in establishing a code of conduct for research and researchers, and in ensuring the control and protection of all San intellectual property (WIMSA 2001; WIMSA 2003; see also Chennells (Chapter 11)).

The San became increasingly aware of the appropriation of their knowledge over centuries, without acknowledgement or compensation. How, it was asked, had the CSIR obtained local knowledge of *Hoodia* without the San knowing, and how could such knowledge be protected from future exploitation? Although legislation to protect and promote indigenous knowledge systems was being developed in South Africa at the time of the negotiations, and had been for at least 5 years, the San had not been consulted about its content and scope. The lack of legislation to protect the holders of such knowledge was a major stumbling block, requiring the San to negotiate in the absence of any legal requirement for benefit-sharing agreements with owners of knowledge or biological resources. This gap in the South African statute book was subsequently filled in 2004 by the introduction of the Biodiversity Act (Republic of South Africa 2004), and its supplementary regulations (see Wynberg, Chapter 7; Taylor and Wynberg 2008). A similar situation pertained in other countries of origin, such as Namibia and Botswana, where no law was yet in place requiring benefit-sharing agreements.

On the part of the CSIR and government, the absence of legislation created uncertainties as to who should be party to the benefit-sharing agreement and exactly how traditional or indigenous knowledge should be obtained or used. The CSIR stepped gingerly, unsure (and doubtless unenthusiastic) about ‘shedding their white coats’ and entering into protracted negotiations, but politically obliged to do so. A primary concern for the CSIR was to ensure that the San leaders they engaged with were genuine and representative, and that their agreement with the San would not lead to a flurry of claims to ownership of the knowledge from third parties.

Represented by Petrus Vaalbooi, chair of the South African San Council, with Roger Chennells, one of the authors of this chapter, acting as legal representative,

a series of meetings ensued between the San and the CSIR. In March 2003, less than 2 years after they had commenced, negotiations concluded on the specifics of a mutually acceptable benefit-sharing agreement. Announcing the deal, Ben Ngubane, South African Minister of Arts, Culture, Science and Technology, referred to its historical significance in 'symbolising the restoration of the dignity of indigenous societies' and unleashing benefits by joining together owners of traditional knowledge and local scientists to add value to the biodiversity and indigenous knowledge systems of southern Africa. It was the 'right thing' to do, he said (Ngubane 2003).

6.5.4 The CSIR-San Benefit-Sharing Agreement

The parties negotiated at arm's length for 18 months, the San initially claiming 10% of the royalties in response to the CSIR's early offer of 3%. Both parties argued strongly in favour of their positions, each listening to the other's position, considering and reconsidering implications, moving steadily to ensure progress and finally, reluctantly, settling on the agreed amounts set out below.

In terms of the agreement (CSIR and South African San Council, 2003) the San would receive 6% of all royalties received by the CSIR from Phytopharm as a result of the successful exploitation of products (Fig. 6.3). This would be for the duration of the royalty period or for as long as the CSIR received financial benefits from commercial sales of the products (Provisions 1.5 and 2). The San would also receive 8% of the milestone income received by the CSIR from Phytopharm when certain performance targets were reached during the product development period. In the event of successful commercialization, these monies would be payable into a trust set up jointly by the CSIR and the South African San Council to raise the standard of living and well-being of the San peoples of southern Africa[9] (Fig. 6.3). Both the CSIR and the San Trust were required to put clear and transparent accounting procedures in place with regard to financial benefits paid by the CSIR and used by the San Trust. The trust would include representatives of the CSIR, the ≠Khomani, !Xun and Khwe, other San stakeholders in southern Africa, WIMSA, a South African lawyer nominated by the South African San Council and the Department of Science and Technology, with strict rules determining the distribution of funds to beneficiaries. Payments would not be made to individuals and would need to be used to attain the aims and objectives of the trust. No distribution of funds would be made to a beneficiary community or institution unless a request, approved formally by the trust, set out a detailed budget and coherent plan, identified a bank account opened by elected representatives with a proper constitution, and indicated the capacity to account fully for the proper expenditure of funds (see also Wynberg et al. Chapter 12, for a further account of the trust's operation).

[9] Deed of Trust of the San *Hoodia* Benefit-Sharing Trust.

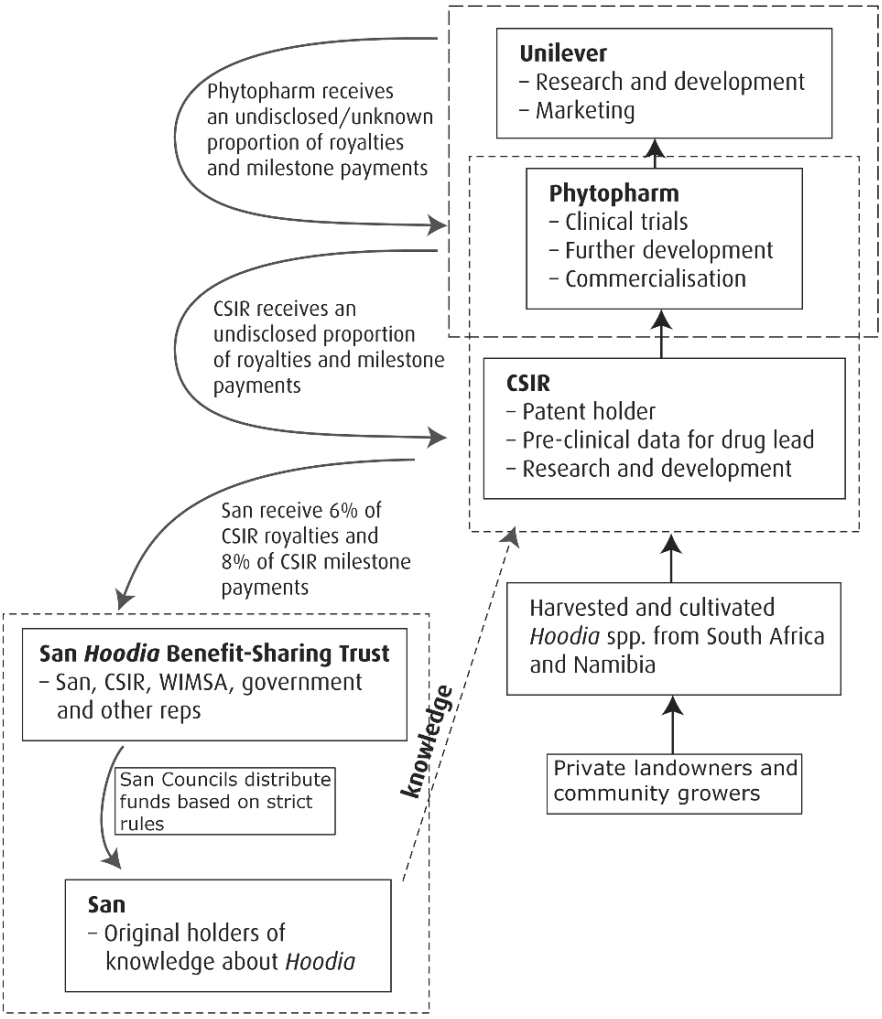

Fig. 6.3 Benefit Sharing and Value-Adding Under the San-CSIR-Phytopharm-Unilever Agreements

The benefit-sharing agreement also committed the parties to conserving biodiversity and undertaking best-practice procedures for plant collection (Provision 3.6), required the CSIR to grant the San access to existing study bursaries (Provision 3.7) and, significantly, laid the groundwork for further collaboration in bioprospecting (Provision 3.8).

In addition to spelling out the details with respect to benefit sharing and administrative aspects such as accounting, the agreement also broadly covered intellectual property issues and, importantly, set out comprehensive measures to protect and indemnify the CSIR. 'Knowledge' was defined as 'the traditional knowledge on the uses of the *Hoodia* plant that occurs in Southern Africa, originally in the hands of the San people'.

Provision 4 of the agreement specified that 'any intellectual property that may be developed or created by the CSIR, including any patent, trade mark or plant breeder's right, as a result of any use of the traditional knowledge, shall be and remain vested in the CSIR'. Moreover, the South African San Council had no right to claim any co-ownership of the patents or products derived from the patents.

Provision 6, 'Warranties and Indemnity', included an undertaking and warranty by the San that, *inter alia,* it was the legal custodian of traditional indigenous knowledge on the use of *Hoodia*; that it would not assist or enter into an agreement with any third party for the development, research and exploitation of any competing products or patents; that it would not approach Phytopharm or Pfizer to obtain additional financial benefits; and that it would not contest the enforceability or validity of the CSIR's right, title and interest in the P57 patent and related products.

A further provision on third-party claims (Provision 9) set out various measures to protect the CSIR against claims by any third party for intellectual property infringement and stipulated that a successful third-party claim against the CSIR could lead to a review of the agreement to accommodate claimants in the sharing of financial benefits. It also required the South African San Council to share financial benefits with a third party if the latter were successful in proving a claim.

In February 2005, the San Trust, formally named the San *Hoodia* Benefit-Sharing Trust, was registered. The content of the trust document was discussed over several meetings, including a consultative conference at Upington, South Africa, in October 2003, during which San delegates from South Africa, Namibia and Botswana debated issues and agreed upon guiding principles relating to benefit sharing. There was unanimous agreement that 75% of all trust income would be equally distributed to the then constituted San councils of Namibia, Botswana and South Africa; and that 25% would be retained by the trust for internal and administration purposes and for allocation to WIMSA. Priorities within the region, such as education, leadership empowerment and land security, were agreed upon as non-binding recommendations to the councils. Principles for benefit sharing that would bind the trust were unanimously endorsed by the WIMSA annual general meeting in December 2003 (WIMSA 2004). The trust began its work in earnest, electing a chair, secretary and treasurer, and started engaging with the practical challenges of distributing milestone income received from the CSIR, at that time a total of some R569,000 (see Wynberg et al. Chapter 12). The derivation of this amount was from two milestone payments to the CSIR, from Pfizer and Unilever respectively, from which 8% was allocated to the San *Hoodia* Trust (Table 6.2).

6.6 *Hoodia* Booms and Busts: 2001–2006

At the same time as institutional arrangements were being established to share benefits arising from *Hoodia* commercialization, a swathe of opportunistic *Hoodia* growers and traders were emerging outside the context of the CSIR-Phytopharm-Unilever agreements. The publicity generated by the agreements, the marketing

Table 6.2 Benefit-Sharing Payments to the San-*Hoodia* Trust from the CSIR, Paid into the Trust Bank Account on 11 May, 2005

Date	Payments received by CSIR	Foreign currency	ZAR amount	San portion
02/03/2000	First milestone Pfizer licence	US$500,000	3 245 750.00	259 660.00
14/03/2005	Unilever licence with Phytopharm milestone payment	350 020	3 867 791.00	309 423.28
	Total		7 113 541.00	569 083.28

opportunities presented by traditional San use of the plant and the patent awarded to the CSIR had led to frenzied interest in *Hoodia* amongst plant traders. By 2004 concerns about the threats posed to natural populations through unregulated collection led to the inclusion of *Hoodia* species in Appendix II of CITES.

By 2006 trade had escalated exponentially—and, in many cases, illegally—from just 25 tons in 2004 to more than 60 tons of wet, harvested material per year, sold as ground powder for incorporation into non-patented dietary supplements (see Fig. 6.4). In North America in particular, dozens of *Hoodia* products were being advertised on the Internet and sold in drugstores and pharmacies as diet bars, pills, drinks and juice, all traded by a myriad of companies 'free-riding' on the publicity and clinical trials of Phytopharm and Unilever. The CSIR patent was focused on the *Hoodia* extract, and nothing prevented other companies from simply selling the raw material for incorporation into herbal and dietary supplements. Many products were of dubious authenticity, contained unsubstantiated quantities of *Hoodia*, made unfounded claims and implied association with the San, who received no benefits (e.g. FDA 2004).

For example, an advertisement by the US-based BioMed Pharmaceuticals promoted Trimphetamine as the 'first commercially available product containing the revolutionary *Hoodia gordonii* cactus plant', based on a standardized natural extract of the plant, and another US-based company, Hi-Tech Pharmaceuticals, marketed a similar *Hoodia*-based product, Lipodrene, citing use of *Hoodia* as an appetite suppressant by the San. A rather barefaced advertisement for the Hoodoba '*Hoodia* gordonii diet pill' described the 'push by western drug companies' to 'sideline the indigenous people and turn this remarkable plant into a synthetic prescription drug', and then went on to do the same, by using the image and knowledge of the San to market the product as a natural extract (see www.*hoodia*-dietpills.com). An Internet advertisement (since removed) for Aloe *Hoodia* described how Pfizer had decided to invest 'millions' to research the benefits of the plant as a new anti-obesity drug and an advertisement for Pure *Hoodia* referred to the success of clinical trials for *Hoodia* (see www.purehoodia.com). These and related products raised important ethical and legal issues, more significantly in their neglect of the San and countries of origin as beneficiaries of commercialization, but also in the extent to which they free-rode on the research done by the CSIR and Phytopharm to demonstrate safety and efficacy.

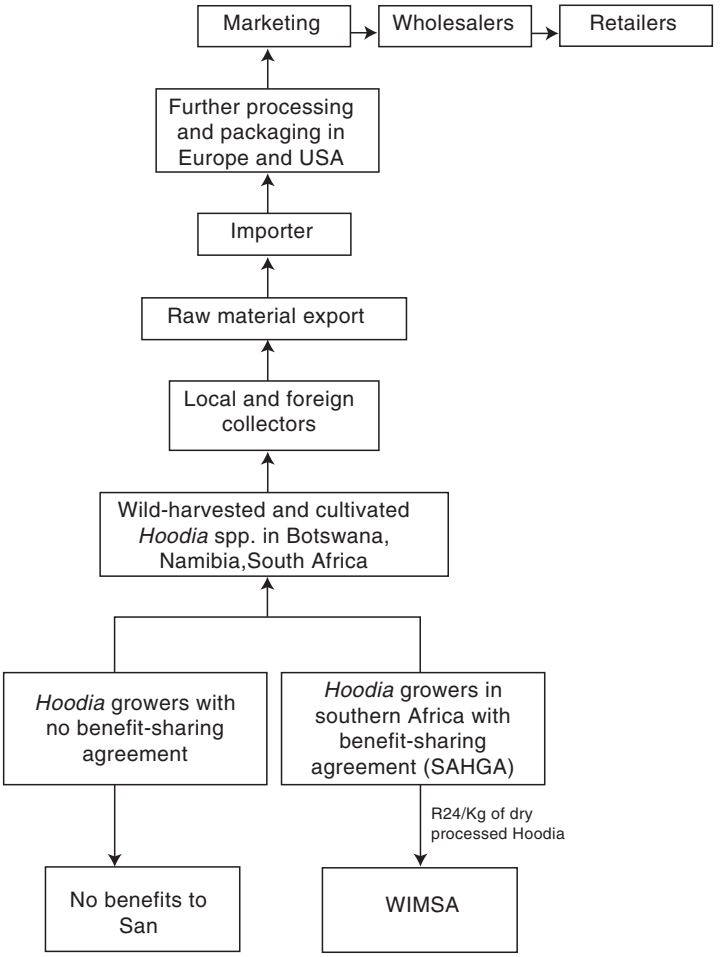

Fig. 6.4 Benefit Sharing through SAHGA and the Hoodia Value Chain Based on Trade of Raw Material

Concerns led to the closer analysis of products by the US Food and Drug Administration (FDA), which revealed that many had little or no *Hoodia* content and lacked adequate evidence of safety (e.g. FDA 2004). The US Federal Trade Commission (FTC) also brought action against spammers sending e-mail messages about *Hoodia* weight-loss products, alleging that the claims made for the products were false and unsubstantiated (FTC 2007). Along with this boom, poaching and illegal harvesting of wild *Hoodia* was widespread and unregulated, and farmers planted hundreds of hectares in the expectation of the boom to come. In South Africa and Namibia, illegal trade and harvesting of *Hoodia* resulted in a number of

prosecutions and arrests; the high prices commanded for the dry product of up to US$200 per kilogram had led to the incorporation of the plant into a global underground network of diamonds, drugs and abalone.[10]

6.7 Negotiating a Benefit-Sharing Agreement with the Southern African *Hoodia* Growers Association

From 2006, increasing concern about the quality and safety of material sold as *Hoodia*, and about over-harvesting and the sustainability of *Hoodia* supply, led to a more regulated industry based on cultivated material. Greater vigilance on the part of the FDA and FTC as well as the American Herbal Products Association rapidly reduced the number of illegitimate products on the US market, and regulators in South Africa, Namibia and Botswana introduced permitting procedures to prohibit the harvesting of *Hoodia* in the wild, require its transparent cultivation and set in place mechanisms to track trade across borders.

In South Africa, those involved in growing *Hoodia* for the herbal and dietary supplement market negotiated another benefit-sharing agreement with the San, based on a levy on processed *Hoodia* (South African San Council and Southern African *Hoodia* Growers 2006). This process was initiated in late 2005 when the San were approached by a group of South African *Hoodia* growers who were cognizant of their obligations to share benefits with the San under the 2004 Biodiversity Act and its anticipated access and benefit-sharing regulations. The San realized that the new market for *Hoodia* as a food additive or dietary supplement was likely to grow over the years, and that they had a right to share the benefits. Because these products did not relate directly to the P57 patent and the use of *Hoodia* extracts, the San were legally able to sign an additional benefit-sharing agreement with *Hoodia* growers that was not in breach of their prior agreement with the CSIR.

Negotiations commenced between the South African San Council (again acting on behalf of WIMSA) and the SAHGA, which represented the interests of some commercial growers of *Hoodia* in South Africa who had agreed to comply with certain standards of best practice, safety, fair trade and benefit sharing. In March 2006 a preliminary benefit-sharing agreement was concluded with the SAHGA. In terms of the agreement 6% of the gross value of *Hoodia* sold would be allocated to WIMSA – 4% into a trust for the San and 2% to WIMSA or the South African San Council. No member was permitted to sell to vendors engaged with the production or marketing of illegal *Hoodia* products.

Royalties of R176,000 (US$22,000) trickled in from this agreement, but it was soon replaced with another more comprehensive initiative that included the majority of South African *Hoodia* growers as well as South African provincial environmental

[10] An endangered marine mollusc, highly sought after as a cultural delicacy in the East and subject to high levels of illegal trade.

government agencies responsible for ensuring sustainable use of *Hoodia* and administering permits (see Wynberg, Chapter 7). After a year of negotiations, during which the different realities and negotiating positions of the respective parties emerged in an increasingly mature climate of transparency, a benefit-sharing agreement was concluded in March 2007 between the San and the newly formed SAHGA. This had been preceded by the signing of a memorandum of understanding in January 2007 between the San (represented by WIMSA), *Hoodia* growers and the Western Cape and Northern Cape environmental departments[11] which captured the intention of the parties as they entered negotiations.

The benefit-sharing agreement (WIMSA and the Southern African *Hoodia* Grower's Association 2007), drafted to be compliant with the provisions of the Biodiversity Act, acknowledged the San to be the primary holders of traditional knowledge about *Hoodia*, having a legal right to share benefits arising from its harvesting, growing and marketing. It also recognized the urgent need for regulation to minimize impacts on wild populations and to ensure the attainment of standards of legality, safety and fair trade. The stated objectives of the non-profit SAHGA included:

- To regulate the legal production and harvesting of *Hoodia* by its members, in compliance with the CBD
- To promote a sustainable *Hoodia* industry in southern Africa
- To liaise with all role players
- To gather and exchange relevant information relating to permits, quality control, sales and compliance
- To promote research

Two San representatives were elected to be members of the board of directors and another two were designated as observers. WIMSA in turn was to ensure the proper administration of financial benefits, and to further the objectives of SAHGA and help with effective marketing of *Hoodia*. Although the stated intention of the parties was to create an exclusive joint venture and benefit-sharing agreement, WIMSA was entitled, on good cause, to motivate to SAHGA for the signing of another, separate agreement. Parties additionally agreed to promote SAHGA as the only legitimate source of *Hoodia* for the food, food additive and dietary supplement market, outside of the CSIR-Unilever agreement and to 'inform the world' that *Hoodia* products outside of the two benefit-sharing agreements were illegal under the CBD. The agreement also, significantly, acknowledged other groups holding traditional knowledge of *Hoodia*, such as the Nama and Damara, and provided an opening for further discussions and possible agreements with such groups.

Financial benefits for the San were formulated based on a ZAR 24 levy charged on each kilogram of dry, processed *Hoodia*, paid prior to the issuing of CITES export permits and to be revisited on an annual basis. Calculation of the levy was

[11] Unpublished signed legal agreement.

based on a number of factors including the previous SAHG levy of 6% of the sale from the farm, as well as conditions in the world *Hoodia* market – recognizing its high levels of fluctuation, the need for the levy to be affordable for growers and other equity considerations. The agreement also provided for re-evaluation after 1 year, taking into account the need for the eventual amount to be fair to both sides. Parties were fully aware that the original figure of 6% had been agreed upon with SAHG without the benefit of adequate knowledge about trade volumes, without extensive calculation of the likely implications of percentages for all parties, and without sufficient reliable information to fix an appropriate percentage with certainty. Conflict resolution was proposed through mediation or, failing this, through arbitration. The agreement, whilst negotiated in South Africa, was drafted in such a way as to welcome and enable the participation of *Hoodia* growers from neighbouring Namibia and Botswana in due course.

At the time of going to press, the SAHGA benefit-sharing agreement had failed to deliver any of the promised payments to the San, largely because the Minister had not endorsed the agreement, thereby rendering it unenforceable by government in terms of the 2008 Biodiversity, Access and Benefit-Sharing Regulations (see Wynberg, Chapter 7). The agreement is currently being renegotiated and redrafted in such a way that compliance at all levels of government will give effect to the primary intention of the parties, namely that benefits from growing *Hoodia* be shared with the San.

6.8 Implementation Challenges

The conclusion of two benefit-sharing agreements is a major achievement. Indeed, these agreements are very rare examples indeed of the much-touted benefits from bioprospecting having practical realization. Nonetheless, implementation poses a number of challenges to the San, to those involved in the *Hoodia* industry and to regulators and policymakers.

6.8.1 Decision-Making and the Distribution of Benefits

One of the key challenges concerns the way in which decisions will be made about the sharing of existing and, hopefully, future benefits. The CSIR-San agreement will pay 6% of royalties into the San Trust, which, as described above, has begun preparing the policies and structures necessary to distribute anticipated flows of money. The fair and equitable distribution of large sums of money to beneficiaries in three different countries would be an enormous challenge for any organization. The fact that these beneficiaries are impoverished indigenous peoples, wrestling with problems of organizational cohesion and underdevelopment as described in Chennells et al. (Chapter 9) and Wynberg et al. (Chapter 12), makes this challenge even more complex.

The SAHGA benefit-sharing agreement also promises to deliver millions of rands within the next few years directly to the San regional organization WIMSA. This money has no prior allocations earmarked, so distributing it wisely will present the relatively inexperienced board with major challenges.

The responsibility on San individuals on the San Trust, as well as on the WIMSA board, to meet heightened expectations and to act wisely and transparently in the eyes of the watching world will be onerous indeed. NGOs entrusted with providing support will be expected to shoulder part of this burden. The objective will be to minimize the negative social and economic impacts, and the intracommunity conflicts that may arise following the introduction of large sums of money into San communities.

There is limited international and local experience in the administration and implementation of such agreements, and few, if any, cases address the sharing of benefits within communities. As Barrett and Lybbert (2000) point out, benefit-sharing questions have thus far remained issues of distribution between the community in aggregate and outsiders, with little practical experience at a local and intracommunity level. There have been some early indications, however, of the divisive impact that natural product trade can have in indigenous communities. In India, for example, the commercialization of Jeevani *(Trichopus zeylanicus*), a wild plant with anti-fatigue properties, has led to divisions amongst the tribal community, the Kanis, as to how their knowledge should be used (Tobin 2002; Gupta 2004; Chaturvedi, Chapter 13). In Peru, a 1996 agreement of the International Cooperative Biodiversity Group also led to conflict between organizations representing local Aguarana communities, as well as at a national level (Tobin 2002. Greene 2004).

In the case of the San, intracommunity issues are especially complex. The organizations set up to represent the San politically are relatively new, and the introduction of Western values and economies into supposedly traditional communities, already fractured and 'hybridized', presents a set of diverse social and economic problems. Robins (2002) describes the social complexities of contemporary San identity, knowledge and practice, and charts the intracommunity divisions and conflict that emerged between self-designated 'traditionalists' and 'Western bushmen' when San land claims were lodged in the Northern Cape province of South Africa. While these claims resulted in significant benefits for the San, they also had unintended consequences in the form of conflict. Robins (2002) points out the contradictions between San 'cultural survival' and the promotion of the values of 'civil society' and 'liberal individualism', a conclusion that holds particular resonance for the *Hoodia* case, contextualized as it is within the international discourse of indigenous peoples, a vigilant NGO community alert to biopiracy cases, and a new policy framework that requires fair and equitable benefit sharing for the use of traditional knowledge.

The possible compensation of other groups that use *Hoodia* and have traditional knowledge of the plant, such as the Nama, Damara and Topnaar, also represents a major challenge that will have to be resolved, especially once *Hoodia* markets mature and significant profits begin to flow. Already, Namibia has articulated a

position that supports the inclusion of the Nama and other groups in benefit-sharing arrangements, particularly relating to participation in *Hoodia* growing projects (Ministry of Environment and Tourism, 2007). This position is bolstered by the fact that *Hoodia* wild and cultivated populations occur in areas occupied by Nama communities. A 2008 meeting between *Hoodia* growers from South Africa and Namibia recognised the need for an alignment of approaches on both benefit sharing as well as marketing (University of Cape Town and University of Central Lancashire, 2008), and led to the San agreeing to commence negotiations with Nama traditional leaders in Namibia. However, Nama communities, even more than the San, lack organizational structures and cohesion and have required substantial support to get to the point at which they can negotiate their rights, as well as manage and disburse incoming funds. In the interim, structures have emerged through the *Hoodia* Growers Association of Namibia to raise and manage funds for the inclusion of the Nama and other indigenous groups in the *Hoodia* industry, with the intention of building their organizational and technical capacity in the medium to long term. The objective is that these two important indigenous groupings, both holders of traditional knowledge relating to *Hoodia*, will formalise a practical agreement about how benefits from the growing of *Hoodia* are to be shared between their respective communities.

6.8.2 Regional Differences in Benefit-Sharing Policies

One of the more interesting aspects of the case lies in its regional implications. *Hoodia* is a biological resource that is shared across national political boundaries, and knowledge of the plant is similarly shared by communities straddling these boundaries. Thus far, however, South Africa has played a leading role: in lodging the patent, developing commercial partnerships with multinational companies, negotiating benefit-sharing arrangements with the San and facilitating legal trade in the plant. Botswana and Namibia, by comparison, although involved in harvesting and cultivating *Hoodia*, have not yet legalized trade in the plant nor developed commercial partnerships.

Moreover, as described in Wynberg (Chapter 7), South Africa has adopted access and benefit-sharing (ABS) legislation and supports recognizing the San as a community with clear rights to benefit from *Hoodia*, but Namibian and Botswanan policies have been more ambivalent. Neither Namibia nor Botswana has ABS legislation and in both countries benefits from *Hoodia* are considered to belong to the state,[12] rather than the San or other traditional knowledge holders. Unsurprisingly, these divergent policy approaches have led to concerns.

[12]The CBD regulates relationships between states and affirms that countries have national sovereignty over their genetic resources. The distribution of such benefits is left to national discretion, within the requirements of article 15 and article 8j, which declare that holders of traditional knowledge have rights over their knowledge (see also Wynberg and Laird, Chapter 5).

A central concern relates to the difficulties of controlling trade. There have been many reports of illegal material entering South Africa from Namibia and being exported from South Africa under permit. The areas in which the plant occurs are typically very remote and illegal harvesting is difficult to monitor and combat. Steps could be taken to address these concerns, but their efficacy would be questionable without a regionally coherent position on *Hoodia* use. Strategic approaches to value-adding and the use of marketing tools such as geographical indications would also be undermined in the absence of strong regional collaboration – needed at government, industry, farmer and community level.

Although the San Trust, which was set up to disburse benefits, already implements benefit sharing across regional boundaries, based on an acknowledgment of the shared nature of *Hoodia* knowledge, there is clearly a need for benefit-sharing strategies to be developed at regional and national levels in cases where genetic resources are shared across boundaries.

6.8.3 Hoodia Trade and Markets

Without the development of a sustainable and viable industry, no benefits will emerge, and a set of complex challenges also confronts those involved in trading and growing *Hoodia.* As with other agricultural commodities, *Hoodia* markets follow the law of supply and demand, which determines the prices, quantities and allocation of resources (Wall 2001). In line with the classical model described by Homma (1992), *Hoodia* has moved through a rapid expansion phase, followed by a stabilization phase, where an equilibrium has been reached between supply and demand, supposedly close to the maximum capacity of extraction of the product. Prices have consequently risen because of the inability to meet a growth in demand, which, as Wynberg (Chapter 7) describes, has led to the adoption of policies to protect the sector or stimulate sustainable production. The shrinking of the resource, restrictive policies on wild harvesting and incentives to cultivate have stimulated a substantial increase in *Hoodia* cultivation, with the challenge now to secure markets for this material. Similarly, the recent withdrawal of Unilever from *Hoodia* development has led to an unstable market and questions as to whether a product can be developed that is safe, efficacious and desirable to consumers.

Further challenges lie in the monitoring of compliance with the benefit-sharing agreements. While this is relatively straightforward and effective for the CSIR-San benefit-sharing agreement, which has clear milestones and reporting mechanisms, it is less so for the SAHGA benefit-sharing agreement. Many *Hoodia* traders wish their trade volumes to remain confidential, yet the agreed levy to the San cannot be calculated without this information. The SAHGA agreement depends largely on good faith and the proactive declaration by growers of volumes traded and monies owed. As already noted, however, there is no government endorsed benefit-sharing agreement to date and many growers have proved reluctant to provide the necessary

information and levies. It is anticipated that the redrafted agreement will assist with enforcing compliance by *Hoodia* growers and traders.

Hoodia sales are also currently severely depressed as a result of an increased crackdown by compliance institutions on new and unregulated products. The environmental government agencies responsible for issuing permits are not legally required to provide SAHGA with this vital information, but with the promulgation of the regulations and an intended amendment of the SAHGA constitution, it is anticipated that the intended benefit-sharing payments will flow to the San within the next year.

Some of the greatest threats to benefit sharing lie outside the region. Although no conclusive figures exist, it is well known that extensive *Hoodia* populations have been established elsewhere in the world. Some of this genetic material may have been acquired before the entry into force of the CBD, and some could just as easily have been smuggled out of the region without the required permission. It is therefore possible that a *Hoodia* industry could thrive outside of southern Africa, without channelling benefits to the original knowledge holders.

6.9 Conclusion

The *Hoodia* case study tells a complex story with many strands, and from it a number of important lessons and conclusions can be drawn that ought to be integrated into ongoing debates about ways in which benefit sharing for communities can be made more equitable. One of the most crucial lessons is the need to get it right from the start. Obtaining the prior informed consent of communities holding knowledge about biodiversity from the very outset of a project – and engaging them as active partners – is an absolutely fundamental principle of benefit sharing. The *Hoodia* case study illustrates what can go wrong when this principle is ignored.

The negotiating process between the CSIR and the San has demonstrated the importance of relationship building between role players and of having in place a political climate conducive to fair deliberations. It has also affirmed the importance of community-based institutions through which holders of traditional knowledge can be represented in negotiations and benefits can be channelled. The process has highlighted the prominent role played by NGOs, legal representatives and intermediaries in benefit sharing – in this case not only in helping the San attain their rights, but also in shaping San politics and economic development.

One of the major impacts of the commercialization of *Hoodia* has been the wide-ranging interest it has aroused about the importance of protecting traditional knowledge and ensuring that holders of such knowledge receive fair compensation. Amongst the San, the *Hoodia* case is considered an important empowering tool to enable more informed decisions to be made about their intellectual property and ways to protect it. At government level, the case has led directly to an increased focus and emphasis on biodiversity and its potential value, and, in South Africa, on the inclusion of prior informed consent and benefit sharing in biodiversity legislation

and the requirement of disclosure of origin prior to the granting of patents. At the international level, the case is widely considered to have set precedents about the ways in which holders of traditional knowledge should be compensated for their knowledge.

There is clearly an urgent need to introduce new forms of protection for traditional knowledge that not only give communities rights over their knowledge, but also enable the wider preservation and promotion of such knowledge systems. The *Hoodia* case demonstrates the value of an integrated system to protect and promote traditional knowledge and, in addition, the importance of so-called 'defensive protection' to prevent the misappropriation of traditional knowledge.

Some of the lessons are still to be learnt and some are only unfolding. If the San receive significant sums of money, it will be extremely difficult to determine who benefits and how benefits are spread across geographical boundaries and within communities, and to minimize the negative social and economic impacts and conflicts that could follow the introduction of large sums of money into impoverished communities. The due compensation of other communities such as the Nama, Damara and Topnaar will also require careful consideration, including the fact that participation in government-assisted growing schemes is a significant benefit. Above all, beneficiaries will need continued legal, administrative and technical support to claim

Box 6.1 What is *Hoodia*?

Species of the genera *Hoodia* and related *Trichocaulon* have long been used as thirst quenchers and appetite suppressants (White and Sloane 1937) (Fig. 6.5). Both genera are members of the Apocynaceae family, succulent perennials adept at storing moisture during the long dry spells of their native habitats (CITES 2004). The unusual flowers are flat and saucer-like in shape and brownish in colour, and form prolifically near the stem tips in summer, when they are often characterized by a distinct carrion smell to attract pollinating flies. The stems are cylindrical, leafless and typically multi-angled, ribbed and spiny. More than 20 species have been recorded from southern Africa, although the species of most interest for their appetite-suppressing properties are *Hoodia gordonii, H. currorii, H. flava, H. lugardii* (now *H. currorii* subsp. *lugardii*), *H. piliferum* (previously *Trichocaulon piliferum*), *H. officinale* (previously *Trichocaulon officinale*) (Van Wyk and Gericke 2000; White and Sloane 1937; patent WO 9846243A2). Vernacular names for the plants include *ghaap* (sometimes spelt *ngaap*, *ghap*, *gap* or *gnaap*) and *!khobab*, *|goa.-|*, *|khowa.b*, *|goai-|*, *|khoba*, *|khoba.b|s*, *|khowab*, *|goab*, *otjinove*, *!nawa#kharab*, *sekopane* or *seboka* (White and Sloane 1937; Smith 1966; Malan and Owen-Smith 1974; Van Wyk and Gericke 2000; Hargreaves and Turner 2002; CITES 2004).

The genus *Hoodia* was named in 1830 after Van Hood, a keen grower of succulent plants (Barkhuizen 1978). Two types of *ghaap* were previously

(continued)

Box 6.1 (continued)

recognized by colonists and indigenous communities alike: true ghaap (*Trichocaulon* species) and the allied genus *Hoodia,* which was known as *bitterghaap*, *bobbejaanghaap* (translated from Afrikaans as 'baboon soap', referring to the slimy inner texture of the skins of *Hoodia* and to the fact that it is not suitable for human use), *jakkalsghaap*, *slangghaap*, *wildeghaap* or *wolweghaap*, the prefix used to denote worthlessness or inferiority (Smith 1966). *Trichocaulon* species have smaller, more rounded and almost thornless stems with small flowers, whilst *Hoodia* have long, narrow and thorny stems with large showy flowers. However, Bruyns (1993) showed there to be considerable overlap between the two groups and united all *ghaap* species under *Hoodia*.

Fig. 6.5 Flowering *Hoodia gordonii*, Ceres (Karoo), Western Cape, South Africa (Photo: Rachel Wynberg)

what is rightfully theirs, and to do so in a manner that deliberately – though cautiously – brings tangible and effective benefits to the original holders of *Hoodia* knowledge.

References

Barkhuizen, B. P. (1978). *Succulents of Southern Africa*. Cape Town: Purnell.

Barnard, A. (1996). Lourens van der Post and the Kalahari debate. In P. Skotnes (Ed.), *Miscast: negotiating the presence of the Bushmen*. Cape Town: UCT Press.

Barnett, A. (2001). In Africa the *Hoodia* cactus keeps men alive. Now its secret is "stolen" to make us thin. *The Observer,* 17 June. http://www.guardian.co.uk/world/2001/jun/17/international-educationnews.businessofresearch. Accessed 5 April 2008.

Barrett, C. B., & Lybbert, T. J. (2000). Is bioprospecting a viable strategy for conserving tropical ecosystems? *Ecological Economics, 34*, 293–300.

Bloch, A., & Thomson, C. (1995). Position of the American Dietetic Association: phytochemicals and functional foods. *Journal of the American Dietetic Association, 95*(4), 329–334.

Boonzaier, E., Malherbe, C., & Smith, A. (1996). *The Cape Herders, a history of the KhoiKhoi of South Africa*. Cape Town: David Philip.

Bruyns, P. (1993). A revision of *Hoodia* and *Lavranea* (*Asclepiadaceae–Stapelieae*). *Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie*, 115.

Cape Times (1997). Plant helps in fighting obesity, 26 June.

CBD (2002). Bonn guidelines on access to genetic resources and fair and equitable sharing of the benefits arising out of their utilization. Decision VI/24, 2002, Secretariat of the Convention on Biological Diversity, Quebec. www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf. Accessed 22 March 2008.

Chennells, R. (2001). Letter to the executive president of the CSIR, 5 July.

Chennells, R. (2003). Ethics and practice in ethnobiology, and prior informed consent with indigenous peoples regarding genetic resources. Paper presented at a conference on biodiversity, biotechnology and the protection of traditional knowledge, St Louis, MS, 4–6 April.

Chennells, R. (2004). Attorney's notes relating to San *Hoodia* case.

CITES (2004). Amendments to Appendices I and II of CITES. Proposal to the thirteenth meeting of the Conference of the Parties, Bangkok, Thailand, 2–14 October. www.cites.org/common/cop/13/raw_props/BW-NA-ZA-*Hoodia*.pdf. Accessed 7 April 200.

Colchester, M. (2003). Salvaging nature: indigeneous peoples, protected areas and biodiversity conservation. World Rainforest Movement, Montevideo. www.wrm.org.uy/subjects/PA/text-ten.pdf. Accessed 5 April 2008.

CSIR (1999). Annual Report 1998, Council for Scientific and Industrial Research. Pretoria, South Africa.

CSIR (2001). Adding value to South Africa's biodiversity and indigenous knowledge through scientific innovation. www.csir.co.za. Accessed 4 February 2002.

CSIR and the South African San Council (2003). Benefit-Sharing Agreement, 24 March 2003.

Deacon, H. J., & Deacon, J. (1999). *Human beginnings in South Africa: uncovering the secrets of the Stone Age.* Cape Town: David Phillip Publishers.

Department of Trade and Industry (2008). Address by the Minister of trade and industry. Mandisi Mpahlwa to the National Council of Provinces, 29 May 2008. http://www.thedti.gov.za/article/articleview.asp?current=1&arttypeid=2&artid=1575.

Diamond, J. (1998). *Guns, germs and steel: a short history of everybody for the last 13, 000 years*. London: Vintage.

Dixey, R. (2004). Press conference to discuss the announcement of a licence and joint development agreement between Phytopharm and Unilever for *Hoodia gordonii* extract.

Douglas, J. (2008). Phytopharm, unilever scrap *Hoodia* development, 14 November. http://www.easybourse.com/bourse-actualite/marches/update-phytopharm-unilever-scrap-*hoodia*-development-562184. Accessed 30 March 2009.

Dutfield, G. (2002). Indigenous peoples' declarations and statements and equitable research relationships. In S. A. Laird (Ed.), *Biodiversity and traditional knowledge: equitable partnerships in practice*. London: Earthscan.

Ekpere, J. A. (2001). *The OAU's model law: the protection of the rights of local communities, farmers and breeders, and for the regulation of access to biological resources. An explanatory booklet*. Organisation of African Unity, Scientific, Technical and Research Commission, Lagos, Nigeria.

FDA (2004). 75-day premarket notification of new dietary ingredients. U.S. Food and Drug Administration, Washington, DC. http://www.fda.gov/ohrms/dockets/dockets/95s0316/95s-0316-rpt0218-vol156.pdf.

FTC (2007). FTC stops international spamming enterprise that sold bogus *Hoodia* and human growth hormone pills', 10 October, Federal Trade Commission, Washington, DC. www.ftc.gov/opa/2007/10/*hoodia*.shtm. Accessed 5 April 2008.

Geingos, V., & Ngakaeaja, M. (2002). Traditional knowledge of the San of Southern Africa: *Hoodia gordonii*. Presentation to the Second South-South Biopiracy Summit: 'Biopiracy – Ten Years Post Rio', 22–23 August 2002. Johannesburg, South Africa.

Greene, S. (2004). Indigenous people incorporated? Culture as politics, culture as property in pharmaceutical bioprospecting. *Current Anthropology, 45*(2), 211–238.

Gupta, A. K. (2004). WIPO-UNEP study on the role of intellectual property rights in the sharing of benefits arising from the use of biological resources and associated traditional knowledge. WIPO publication number 769, World Intellectual Property Organisation and United Nations Environment Programme.

Hargreaves, B. J., & Turner, Q. (2002). Uses and misuses of *Hoodia*. *Asklepios, 86*, 11–16.

History of the Bosjesmans, or Bush People (1847). The Aborigines of Southern Africa. London: Chapman, Elcoate & Co.

Hitchcock, R. K., & Biesele, M. (2001). San, Khwe, Basarwa, or Bushmen? Terminology, identity, and empowerment in southern Africa. http://www.khoisanpeoples.org/indepth/ind-identity.htm. Accessed 30 March 2008.

Hitchcock, R., Ikeya, K., Biesele, M., & Lee, R. (2006). *'Introduction', updating the San: image and reality of an African People in the 21st century, Senri Ethnological Studies, vol 70.* Osaka: National Museum of Ethnology.

Homma, A. K. O. (1992). *The dynamics of extraction in Amazonia: a historical perspective. Advances in Economic Botany, vol 9*. New York: New York Botanical Garden.

KFO (2006). Annual Report. Kuru Family of Organisations, Ghanzi, Botswana. www.kuru.co.bw.

Khoisis (1983). Occasional papers of the Departments of Anthropology and Archaeology, vol 4. University of Stellenbosch, South Africa.

Lee, R. B. (1976). *Introduction–Kalahari hunter gatherers: studies of the 'Kung San and their neighbours*'. Cambridge, MA: Harvard University Press.

Lee, R. B., Hitchcock, R., & Biesele, M. (2002). Foragers to first peoples. *Cultural Survival Quarterly, 26*(1), 18–20.

Malan, J. S., & Owen-Smith, G. L. (1974). The ethnobotany of Kaokoland. *Cimbebasia Series B, 2*(5), 131–178.

Marloth, R. (1932). *The Flora of South Africa, vol 3*. Cape Town/London: Darter Bros/Wheldon & Wesley.

Masson, F. (1796). *Stapelia Nova: or, a collection of several new Species of that genus discovered in the interior of Africa.* London: W. Bulmer & Co.

Ministry of Environment and Tourism (MET) (2007). Conference on *Hoodia*, 22–23 February 2007. Schützenhaus, Keetmanshoop, Namibia.

Ngubane, B. (2003) Address by the Minister of Arts, Culture, Science and Technology at the signing of a benefit-sharing agreement between the CSIR and the San, 24 March, Molopo Lodge, South Africa, www.info.gov.za/Speeches/2003/03032410461009.htm. Accessed 5 April 2008.

Penn, N. (1996). Fated to perish: the destruction of the Cape San. In P. Skotnes (Ed.), *Miscast: negotiating the presence of the Bushmen*. Cape Town: UCT Press.
Phytopharm (1997). Phytopharm to develop natural anti-obesity treatment, Press release, 23 June. www.phytopharm.com/news/newsreleases/?page=10&id=1814. Accessed 5 April 2008.
Phytopharm (2001). Successful completion of proof of principle clinical study of P57 for obesity, Press release, 5 December. www.phytopharm.com/news/newsreleases/?page=7&id=1749. Accessed 5 April 2008.
Phytopharm (2002). Future development of P57, Press release, 30 July. www.phytopharm.co.uk/news/newsreleases/?page=6&id=1726. Accessed 5 April 2008.
Phytopharm (2003). Annual report and accounts for the year ended 31 August 2003. Cambridge, UK: Phytopharm plc.
Phytopharm (2004). Interim results for the period to 29 February 2004, Press release, 5 May. www.phytopharm.com/files/news/1588/Interim2004.pdf. Accessed 5 April 2008.
Phytopharm (2007). Phytopharm initiates stage 3 activities of joint development agreement for *Hoodia* extract with Unilever, 24 September. www.phytopharm.com/news/newsreleases/?id=7324. Accessed 5 April 2008.
Phytopharm (2008). Preliminary results for the period ended 30 September 2008, 27 November 2008. http://www.phytopharm.co.uk/news/newsreleases/?id=16517.
Phytopharm (2008). Unilever returns rights to *Hoodia* extract, 12 December. http://www.phytopharm.com/news/newsreleases/?id=16553. Accessed 30 March 2009.
Phytopharm (2009). Progression of the *Hoodia* project under Phytopharm plc, 4 March. Letter to South African government departments.
Povey, K. (2007). Unilever, personal communication, October.
Republic of South Africa (2004). National Environmental Management: Biodiversity Act (Act 10 of 2004). *Government Gazette*, Pretoria. www.info.gov.za/gazette/acts/2004/a10-04.pdf. Accessed 5 April 2008.
Robins, S. (2002). NGOs, "bushmen", and double vision: the ≠Khomani San land claim and the cultural politics of "community" and "development" in the Kalahari. In T. A. Benjaminsen, B. Cousins, & L. Thompson (Eds.), *Contested resources: challenges to the governance of natural resources in South Africa*. Cape Town: programme for Land and Agrarian Studies, School of Government, University of the Western Cape.
SASI (2007). Personal communication with A. Thoma and other members of the South African San Institute, November.
Silvain, R. (2006). Drinking, fighting and healing: San struggles for survival and solidarity in the Omaheke region. In R. Hitchcock, K. Ikeya, M. Biesele, & R. Lee (Eds.), *Updating the San: image and reality of an African people in the 21st century*. *Senri Ethnological Studies*, *vol 70*. Osaka: National Museum of Ethnology.
Skotnes, P. (1996). *Miscast: negotiating the presence of the Bushmen*. Cape Town: UCT press.
Smith, C. A. (1966). Common names of South African Plants. Botanical Survey Memoir No. 35, Department of Agricultural Technical Services, Pretoria.
Soodyall, H. (2006). *The prehistory of Africa*. *Tracing the lineage of modern man*. Cape Town: Jonathan Ball Publishers.
South African San Council and Southern African *Hoodia* Growers (2006). Benefit-sharing agreement and joint venture, March 2006. Unpublished signed legal agreement.
Spies, C. (2002) Report on workshop on benefit sharing between South African San Council and the CSIR on the *Hoodia* P57 project, 13–14 June, Molopo Lodge, Northern Cape province, South Africa.
Stafford, L. (2009). After another cancelled partnership, the future of *Hoodia* remains unclear, *HerbalEGram*, *6*(2). http://cms.herbalgram.org/heg/volume6/02%20February%20/*Hoodia*_Nixed.html. Accessed 30 March 2009.
Stephenson, D.J. (Ed.) (2003). Case Study of the Patenting of P57 and Related Benefit-Sharing and Licensing Agreements with Regard to the Intellectual Property Rights of the San Peoples of Southern Africa. First Peoples Worldwide, Virginia, USA.

Steyn, H.P., & du Pisani, E. (1985). Grass-seeds, game and goats: an overview of Dama subsistence. *SWA Wissenschaftliche Gesellschaft*, Journal XXXIX.

Suzman, J. (2001). *Regional assessment of the San in Southern Africa*. Windhoek, Namibia: Legal Assistance Centre.

Taylor, M., & Wynberg, R. (2008). Regulating access to South Africa's biodiversity and ensuring the fair sharing of benefits from its use. *South African Journal of Environmental Science and Policy*, *15*(2), 217–243.

Theal, G. M. (1892–1919). *The history of South Africa* (*Vol. 4*). London: George Allen & Unwin.

Tobin, B. (2002). Biodiversity prospecting contracts: the search for equitable agreements. In S. A. Laird (Ed.), *Biodiversity and traditional knowledge: equitable partnerships in practice*. London: Earthscan.

Unilever (2009). Termination of the Unilever *Hoodia* Project, 3 March, Letter written to South African government departments.

University of Cape Town and University of Central Lancashire (2008). San-!Khoba: indigenous peoples, consent and benefit sharing. *Hoodia* Information Workshop, Protea Hotel, Upington, 8 May.

Van den Eynden, V., Vernemmen, P., & Van Damme, P. (1992). *The ethnobotany of the Topnaar*. Belgium: Universiteit Ghent.

Van Wyk, B. E., & Gericke, N. (2000). *People's plants: a guide to useful plants of Southern Africa*. Pretoria: Briza Publications.

Vermeylen, S. (2007). Contextualising 'fair' and 'equitable': the San's reflections on the *Hoodia* benefit-sharing agreement. *Local Environment, 12*(4), 1–14.

Von Koenen, E. (2001). *Medicinal, poisonous, and edible plants in Namibia (4th ed)*. Windhoek, Namibia: Klaus Hess Publishers.

Wall, N. (2001). *The complete A–Z economics handbook*. London: Hodder & Stoughton.

Watt, J. M., & Breyer-Brandwijk, M. G. (1962). *The medicinal and poisonous plants of Southern and Eastern Africa (2nd ed)*. London: Livingstone.

White, A., & Sloane, B. L. (1937). *The Stapelieae III (2nd ed)*. CA: Pasadena.

Wilmsen, E. N. (1989). *Land filled with flies: a political economy of the Kalahari*. IL: University of Chicago Press.

WIMSA. (2001). *Media and research contract of the San of southern Africa, approved by the WIMSA Annual General Assembly on 28 November*. Windhoek, Namibia: Working Group for Indigenous Minorities in Southern Africa.

WIMSA. (2003). *The San of Southern Africa: heritage and intellectual property*. Windhoek, Namibia: Working Group for Indigenous Minorities in Southern Africa.

WIMSA. (2004). *WIMSA Annual Report, April 2003 to March 2004*. Windhoek, Namibia: Working Group for Indigenous Minorities in Southern Africa.

WIMSA and the Southern African *Hoodia* Grower's Association (2007). Benefit-sharing agreement and joint venture, as contemplated by the South African Biodiversity Act 10 of 2004.

Wynberg, R. (2004). Rhetoric, realism and benefit sharing – use of traditional knowledge of *Hoodia* species in the development of an appetite suppressant. *World Journal of Intellectual Property, 6*(7), 851–876.

Wynberg, R. (2006). Identifying pro-poor, best practice models of commercialisation of southern African non-timber forest products, PhD thesis, University of Strathclyde, Glasgow.