# Chapter 6
# Overcoming the Taxonomic Impediment: SABONET and the African Plants Initiative


*The taxonomic impediment consists of several problems: the incomplete knowledge of the largely unknown global biodiversity, the insufficient number of experts and their unbalanced distribution across the globe and the taxonomic infrastructures that are not meeting the demands yet.*

Charles Coleman (2015) *Taxonomy in Times of the Taxonomic Impediment*

## 6.1 The Long Walk to the GEF

Sunday 11 February 1990 dawned brightly over southern Africa, nowhere more so than in Cape Town, as the sun's golden rays lit up the slopes of Table Mountain, the tourist icon of the Republic of South Africa. For some people, the mountain's silhouette portrayed a vision of another country, staring down as it did on Robben Island. The calm beauty of the scene belied a palpable tension in the morning air. It was the day on which Nelson Mandela would end his long walk to freedom (Mandela 1994). From the early hours of the morning, tens of thousands of ANC supporters, throngs of diplomats from across the globe, and a swarming mass of international media waited, apprehensively, almost in disbelief. This was the day on which Nelson Rolihlahla Mandela would be released from over 27 years of incarceration.

In Maputo, two thousand kilometres way, just beyond the north-eastern border of South Africa, a rather different group of Africans was developing a strategy for collaboration among plant scientists in a post-Apartheid southern Africa (Fig. 6.1). Thirty biologists from a dozen African countries had spent a week discussing research and coordination needs and opportunities to mobilise a new dawn for the plant sciences in the region. Southern Africa was soon to be freed from the tensions and isolation that had characterised relations between South Africa, its neighbours and the world since 1948, the year in which policies of segregation and disenfranchisement became law under the country's Nationalist Party government.



B. J. Huntley, *Strategic Opportunism: What Works in Africa*, SpringerBriefs in Environmental Science, https://doi.org/10.1007/978-3-031-24880-1_6

**Fig. 6.1** Plant scientists from across southern Africa meet in Maputo, Mozambique, to formulate a collaborative programme for the post-Apartheid era. February 11, 1990

That Sunday morning, at the conclusion of the Maputo workshop's discussions, the participants walked down the potholed streets of the Mozambican capital to join a small gathering of excited people. As the hot day wore on, the crowd grew, singing resistance songs, dancing up clouds of dust, and waving tattered banners calling for the release of Nelson Mandela. We arrived in front of a rather run-down building which housed the African National Congress (ANC) headquarters in Mozambique. A local radio station broadcast the proceedings from Cape Town, relayed via loudspeakers for the benefit of the crowd. A mix of excitement and fear embraced the gathering. It was clear that some delays were being experienced in the release process. One nervous workshop delegate received a message from the Cape. There had been a right-wing attack on Mandela; rioting had broken out; Mandela had been re-arrested. Much noisy protest erupted in the crowd, but fortunately was soon calmed by what was to become the unforgettable, unmistakable, deep intonation and inspiring voice of Nelson Mandela as he addressed the wildly rejoicing crowds assembled in front of the Cape Town City Hall.

Sunday 11 February 1990 became a defining timeline in Africa's history. A less well documented narrative is that of the transformation in botanical and conservation actions that followed the heady days of the early 1990s. Here I describe two initiatives that could not have happened without political change in the region. The first, SABONET, led seamlessly into the second, the African Plants Initiative.

The Maputo meeting was a rather cathartic process for participants from South Africa, cut-off as they had been from free movement across the continent by political and academic isolation for several decades. Here, in Maputo, for the first time, we could work together with colleagues from many African states, states whose governments endorsed the United Nations declaration that Apartheid was a crime

against humanity and had legislation to arrest any South African arriving in their country. The meeting was remarkably free from any rancor, and from the first day agreement was reached to establish a 'Network of Southern African Plant Scientists – NESAPS', specifically to promote information exchange, training opportunities, collaborative studies and to publish a regional journal. *Leadership* would rotate between countries, with the first two-year term based at the National Herbarium of Malawi. The context of the meeting included a view that much of post-colonial Africa had suffered from the paradox of a steady erosion of national collections (of plant and zoological specimens) simultaneous to the rise in international and national concern for biodiversity conservation. An African approach to the paradox was needed, and ambitious action plans were developed and approved by acclamation. We then walked down to the ANC celebrations.

Following the Maputo workshop, meetings were held in Zomba (Malawi) in April 1991 and in Bulawayo (Zimbabwe) in March 1993, but little progress was reported. It was widely assumed that the NESAPS initiative was dead. But events on the international horizon gave signals of hope. In June 1992 the United Nations Conference on the Environment and Development had been convened in Rio de Janeiro, Brazil, setting new global agendas for conservation. Two key outcomes were the Convention on Biological Diversity (CBD 2018) and the establishment of the Global Environment Facility (GEF). The first set clear policy directions for governments and the broader community to achieve biodiversity conservation goals, and the second provided a financing mechanism to support conservation action in developing countries.

In South Africa, the political mood since February 1990 had been swinging from elation to deep depression as negotiations between the government and representatives of the ANC, IFP, SACP, PAC and other liberation movements were undermined by violent interference from both right-wing and left-wing extremists. But the spirit of the Maputo meeting was kept alive. A further regional workshop was convened in September 1993 at Kirstenbosch National Botanical Garden, Cape Town, which brought together 140 botanists from 14 African countries. The Kirstenbosch workshop produced a regional synthesis on southern Africa's botanical diversity (Huntley 1994), plus a strategic plan to mobilise an ambitious vision of a training and capacity development network. The project would be called the Southern African Botanical Diversity Network (SABONET). All that was needed was a generous donor to fund the project. This is where the 'Long Walk to the GEF' began.

Armed with the proceedings of the Kirstenbosch workshop, communication with a wide range of potential donors commenced. Initial responses were not encouraging. As a logical but problematic policy in the new political landscape of South Africa, all foreign donors focused their support on the priorities of the former liberation movements, not on any activity led by a South African statutory institution – such as the then National Botanical Institute (NBI), hosts of the Kirstenbosch meeting.

Despite these challenges, the view of the leadership of NBI was clear – the opportunities created by the CBD and GEF were too good to miss. The timing

seemed perfect, or nearly so, for SABONET. In October 1993 I wrote to an old friend, Chilean ecologist Eduardo Fuentes, who was then with the United Nations Development Programme (UNDP), based in New York. I sent him a draft of the Kirstenbosch proceedings, now in the format of a funding pre-proposal to the GEF. A reply soon arrived to remind me that South Africa was not yet recognised as a member of the United Nations, having been expelled on 30 September 1974, and as such could not qualify for UNDP support. Undaunted, we waited patiently for South Africa's first democratic elections, held in April 1994, followed by the inauguration of Nelson Mandela as its first democratically elected president on 11 May. South Africa was re-admitted to the UN General Assembly on 23 June 1994.

The path now seemed open for SABONET. In September 1994 another proposal was sent to UNDP, and this was approved by GEF/UNDP for 'initial development'. In March 1995 the revised 'Project Brief', having passed a technical review by UNDP, was held back from approval because South Africa had not yet ratified the CBD. Although South Africa had signed the CBD on 4 June 1993, it was not to become a member state to the Convention until 2 November 1995. The goal posts of the GEF seemed to keep moving.

By this time a new GEF contact person, John Hough, had been appointed at UNDP. Hough had years of experience in Africa, and was willing to play the long game. He guided us through the next steps, which required not only the complete revision of our initial rather naïve project outline, but also inclusion in the project document of signed statements, on official government letterheads, from each of the ten southern African countries that would participate in the project. This step proved to be one of the most complicated. Communications between African countries did not then enjoy the speed of the internet, and two countries, Angola and Mozambique, required all working documentation to be submitted in Portuguese. But we persisted, and by late 1995 the Project Document was dispatched to the UNDP offices in New York. I soon received a sympathetic but sobering reply from John Hough. The project proposal was excellent, but funding was not available until the second phase of GEF, that would only commence in 1997.

Unexpectedly, and fortuitously, an interim arrangement could be made. In September 1995, simultaneous to the news that GEF could not initiate funding until 1997, the International Union for the Conservation of Nature (IUCN) Regional Office for Southern Africa (ROSA) in Harare, Zimbabwe, had received funding from USAID for a Regional Capacity Building Network for Southern Africa (NETCAB). Through the support of Achim Steiner, then director of ROSA (and later Executive Director of UNEP and now Administrator of UNDP), SABONET was able to access seed funding to start its activities.

SABONET was now on a fast track. It held its first Steering Committee in Pretoria in March 1996, and in June 1996 the NBI appointed a highly competent Project Coordinator, Christopher Willis. With all arrangements in place, the project commenced training programmes, field trips and herbarium rehabilitation in its ten member countries – Angola, Botswana, eSwatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe (Fig. 6.2).

**Fig. 6.2** Participants from ten African herbaria at a field-based training course. (Photo: Christopher Willis)

With the project mobilised through NETCAB funding, negotiations with GEF continued. When we assumed that everything was in place, a further hurdle was presented – neither Angola nor Namibia had yet ratified the CBD. They could thus not receive GEF funds. A compromise could be arranged, given that IUCN ROSA could fund the activities in Angola and Namibia until these countries had ratified the convention. Further delays and multiple iterations of the Project Document (affectionately called the ProDoc in UNDP-speak) were exchanged between Cape Town and New York. In April 1996 the GEF Council approved SABONET, but the ProDoc needed the GEF CEO's signature – which was inexplicably delayed until September 1997. Eventually, after eight member countries had signed the approved document, the final ProDoc was signed by the UNDP Resident Representative in Pretoria on 20 January 1998. From 1 April 1998 the GEF funds became available. After a gruelling four and a half years of negotiation, the Long Walk to the GEF was over.

## 6.2 The SABONET Model: Learning by Doing

GEF funding totalled US$4.7 million, matched by similar funding from the ten participating countries. The project was approved to run for four years, but due to careful fund management (and the devaluation of African currencies against the dollar) it ran for nine years, 1996–2005. The justification for the GEF/UNDP investment was the project's direct contribution to achieving CBD objectives and articles, in particular:

- Article 12. Research and Training – The Contracting Parties shall … establish and maintain programmes for scientific and technical education and training in measures for the identification, conservation and sustainable use of biological diversity … and provide support for such education and training for the specific needs of developing countries …
- Article 17. Exchanges of information – Each Contracting Party shall … facilitate the exchange of information …
- Article 18. Technical and Scientific Cooperation – The Contracting Parties shall … promote international technical and scientific cooperation … special attention should be given to the development and strengthening of national capabilities, by means of human resources development and institution building …

SABONET was designed as a 'south-south' solution to capacity building, specifically to accelerate training and infrastructure rehabilitation, and to accelerate field work by young botanists in poorly documented African ecosystems. The project could also help break the dependency on the intellectual resources of the north by many African institutions. There was a wide, but not necessarily accurate, perception in the region that in post-colonial Africa the indigenous and local knowledge and skills-base had been eroded. It is true that many students had been drawn away from Africa (to study for higher degrees in northern universities, remote from the realities, needs and environmental circumstances of Africa) and many such graduates either did not return, or if they did, they rapidly entered administrative posts.

At a broader level, support for national or regional botanical diversity inventory, evaluation and monitoring had been superficial. Such interventions had seldom generated either human or institutional capacity. Where botanical surveys had been undertaken, they were often done by foreign consultants. In many cases no new, original field information had been added to the national repository of knowledge; at worst, old information had been erroneously interpreted or synthesised and had thus made a negative contribution to global knowledge on biological resources. It was felt that the situation could only be reversed by an African-based, in-service and carefully targeted human capacity and institution building programme – SABONET.

The project commenced from a zero base. Never before had the curators of the herbaria of southern Africa been able to meet on a regular basis, even less to participate in field trips, or training workshops; far less to receive funding for the basic needs of functioning modern herbaria. SABONET provided the opportunity for active partnerships to develop not only between the leaders of regional herbaria and botanical gardens, but also for in-service training of young technical and research staff. Perhaps most importantly, computers were introduced to herbaria that had never before had internet communications, nor the benefit of electronic data archiving and analysis. Vehicles and field equipment allowed for extended collecting trips to areas of high biodiversity interest (Fig. 6.3). As important as the tangible products resulting from the project was the culture of collaboration between countries – south-south and north-south – that evolved during the successive training sessions, workshops, field trips and joint publications. At the time of the project, the

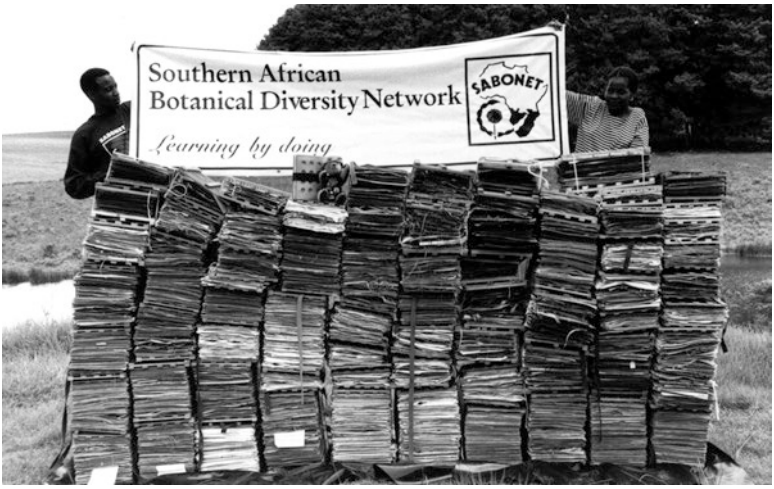


**Fig. 6.3** Botanical collaboration in action: plant presses hold thousands of specimens collected during a SABONET expedition to the Nyika Plateau, Malawi, April 2000. (Photo: Christopher Willis)

internet and electronic social media were unavailable across most of southern Africa. Fortunately, the production of a hard copy *SABONET News* was a very effective medium to keep the work of all participants connected. The use of the *SABONET Report Series* also provided a rapid publication mechanism for the many technical guidelines, checklists, red data lists, field trip reports and progress reports that added to the tangible cohesion of participants and to the excitement that the project created among botanists throughout southern Africa.

The major works coming out of the *SABONET Report Series* (Fig. 6.4) including the massive compilations of the 19,518 species listed in the 892-page *Checklist of South African Plants* (Germishuizen et al. 2006) and the 50,136 species listed in the 1126-page *Checklist of the flowering plants of Sub-Saharan Africa* (Klopper et al. 2006a, b). By the early 2000s, the internet has become widely available and researchers were supported by online data bases and electronic versions of the SABONET publications, giving easy access to the project's results. The importance of these comprehensive compilations was in their provision of updated nomenclatural standards facilitating future botanical work, such as the African Plants Initiative, across the continent. The critical role of such standard checklists is frequently overlooked by the biodiversity conservation industry, where checklists or inventories of a site, a habitat, an ecosystem, a protected area, biome, country or continent are the basic building blocks of biodiversity knowledge. Until the SABONET project, such checklists did not exist for southern Africa nor for Africa south of the Sahara (Figueiredo and Smith 2008; Germishuizen et al. 2006). Nor were skills in electronic data management of herbarium collections available outside of South Africa.

Several reviews of the project have been published (Huntley et al. 1998, 2006; Siebert and Smith 2003, 2004; Steenkamp et al. 2006), while an independent GEF

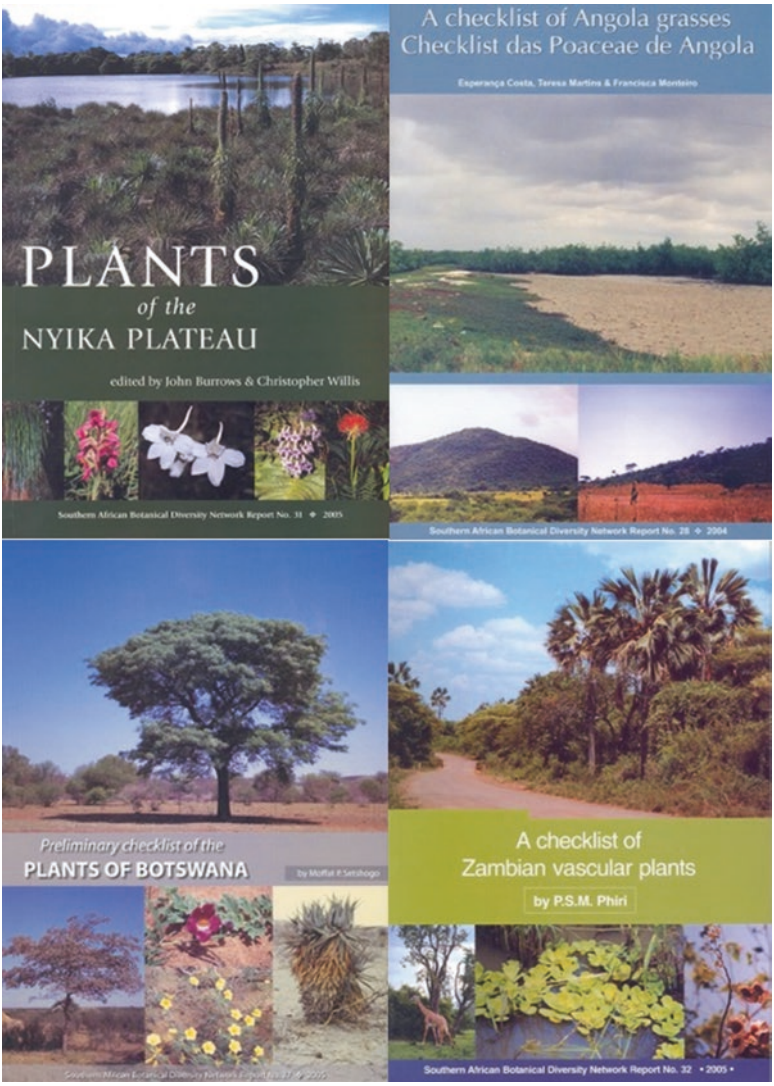


**Fig. 6.4** Cover pages of some of the 43 volumes of the SABONET Report Series

terminal review (Simiyu and Timberlake 2005) gave the project a 'Highly Satisfactory' rating – the highest rank in the GEF evaluation system. Subsequent GEF publications have commented favourably on the quality of the project's products, most particularly on its publications, including 43 volumes in the *SABONET Report Series* and 24 numbers of *SABONET News*; its extended multi-national field trips in Botswana, Malawi and Mozambique; the compilation of floristic checklists for most of the 10 participating countries; plant red data lists; computerised data inventory of over 450,000 herbarium specimens; support of 26 students graduating

with 36 higher degrees; and training of over 150 herbarium and botanical gardens technical staff. Many participants now hold senior positions in their national government and academic institutions. One is the Vice President of her country (Angola). In an extensive review of the history of plant taxonomy in South Africa, Victor et al. (2016) refer to SABONET as: "One of the most influential biodiversity capacity building initiatives globally."

## 6.3 Lessons Learned from SABONET

The GEF independent Terminal Review (Simiyu and Timberlake 2005) concluded that "SABONET has some unique elements that were responsible for its huge success that may not be easy to replicate in other contexts." These included:

- A strong project champion with institutional, regional and international support and presence;
- Visionary yet adaptable project leadership and management; a transparent and strong regional Steering Committee with consistent membership;
- Willing, focused and motivated team players in a regional context; and
- Highly experienced and committed support from the GEF Regional Advisor.

The above attributes were critical to the project's operational success. However, many underlying drivers were also at play, which had both strategic and operational influence on the project results. These included:

- The political transition in South Africa dating from the date of the release of Nelson Mandela in February 1990 (and all political prisoners soon thereafter), followed by democratic elections;
- The rapid political changes in South Africa which opened up unprecedented opportunities for collaboration not only across Africa, but also to access to international donor funding;
- The changing global environmental policy agenda – triggered by the Rio conference and the resultant CBD, UNFCCC, GEF and related initiatives;
- Plant scientists from across southern Africa who found innovative mechanisms to strengthen their profession through a 'south-south' solution;
- The availability of seed funding from IUCN-ROSA to initiate the project during the lengthy negotiations to obtain funding from the GEF;
- The colonial legacy, which included many herbaria, and locally trained botanists, some with many years of experience, and with the capacity to mentor a new generation of botanists;
- The availability of a large and strong institution (NBI) with the capacity to provide a highly skilled Project Coordinator – Christopher Willis – to drive the founding years of the project. Strong project administration skills within NBI proved a critical ingredient for success;

- Key management skills, available to competently process financial transfers to ten different currency areas, to obtain visas for travel by participants between countries, obtain import licences for vehicles and equipment, to convene and report on meetings, publish high quality journals and newsletters, and the multiple administrative requirements attending the management of donor funds;
- The availability of an advanced computer-based data management system for herbarium collections (PRECIS) which could be extended for use in all southern African countries, and the staffing for the transfer of such skills;
- The ability to make special arrangements to support the participation of the two Lusophone countries – Angola and Mozambique – to ensure that their participants were not disadvantaged by language barriers; and
- Serendipity – the good luck and good timing of seed funding from NETCAB while GEF funding was delayed; and of the simultaneous availability of inspired and mutually supportive leaders across many countries and institutions.

SABONET had developed a new professional culture within the southern African botanical community, one that facilitated collaboration in complex, computer-aided data and information sharing systems. The region was ready for an even more ambitious project.

## 6.4 Taxonomy on the Fast Track: The African Plants Initiative

The individual species of plants, mammals, birds, reptiles, etc. are the fundamental units of biodiversity science and conservation action. The identity of individual species within a given community or ecosystem is the first step in any biodiversity assessment. The reliability of species identifications is dependent on sound and testable taxonomies – the system by which peers around the globe agree on what Latinised binomials (scientific names such as *Adansonia digitata* – the baobab) are given to each clearly circumscribed species. Such names are permanently attached to what are called type specimens. Type specimens are typically the original plant material collected in the field, usually dried and compressed in a plant press, mounted on a cardboard sheet and permanently preserved and archived in an herbarium. The type specimen is the point of reference for all further uses of the name, once this has been published in a scientific journal. Fine scale molecular and genetic analyses, no matter how sophisticated, should all refer back to the original herbarium-based type specimen or in the very least the herbarium specimen of the plant from which a sample has been taken.

So far, so good.

Over the past three centuries, several million herbarium specimens have been collected in Africa for scientific research purposes. These specimens were mostly collected by visiting naturalists, scientists and colonial officials and sent back to herbaria and museums in their home countries such as Britain, France, Germany,

Portugal, Belgium and the United States. The vast majority of these specimens, including their type specimens, were thus deposited in European and North American herbaria (Figueiredo and Smith 2010; Greve et al. 2016). For researchers based in poorly-resourced African institutions, access to the original type specimens has therefore been almost impossible. Students of African botany have not easily been able to examine the type specimens that determine the name that must be applied to a particular species. This has created an almost insurmountable barrier for the nurturing of African plant taxonomists. Like many biologists in developing countries, they have suffered from what has become known as the 'taxonomic impediment'.

This 'taxonomic impediment' results from the combination of large gaps in taxonomic knowledge, limited taxonomic infrastructure and the decline of species experts (Hoagland 1996; Huntley 2003; Wheeler et al. 2004; Coleman 2015; Soltis 2017). The term was first used in 1995 at a meeting of the International Union for Biological Sciences (IUBS) Steering Committee on which I then served. It described succinctly a basic challenge to biodiversity science in Africa. The taxonomic impediment was what we were addressing through SABONET. It was a problem that was soon to be resolved – not through any international committee or convention – but by the innovative action by one man – William (Bill) Robertson, a senior administrator with the Andrew W. Mellon Foundation.

I first met Bill Robertson in the 1980s, when we both served on various international science committees. Bill was the respected 'éminence grise' of these research strategising bodies. His insight of what new directions in science were needed to understand environmental problems, and his wide experience of what initiatives might be expected to have remarkable results, were demonstrated in the many programmes that had their origin and impetus through the support he gave to projects of the IUBS and SCOPE.

In June 2003, after a visit to Royal Botanic Gardens, Kew, Bill Robertson came up with an unusual proposal. He had visited the Herbarium, where researchers were busy making digital images of type specimens. By carefully placing herbarium sheets, face-upwards, onto a cushioned platform, and by means of a mechanism that lowered a flatbed scanner face-down onto the specimen, the researchers were able to electronically scan the material without risk of damage to the fragile, often centuries-old, specimens. The process of using the 'HerbScan' was slow and costly. But Robertson could see the value to international botanical scholarship of being able to make the treasures of Kew, and of many other major repositories of plant collections, available at the click of a button via the internet, and through establishing a single integrated portal. The huge costs to researchers in travel, or risks to specimens through postage to partner institutions, could be vastly reduced. More importantly, it would mean that the information housed in the institutions of the north could be transferred back to the countries of origin in the south at low cost to the recipient institutions. A key objective of the Convention on Biological Diversity – for the repatriation of information, if not the physical specimens themselves, to the former colonies of European countries – could be achieved.

Shortly after his visit to Kew, Bill Robertson was in South Africa, where he visited the various projects funded by his institution – the Andrew W. Mellon Foundation. Before returning to New York, Bill called on Gideon Smith, then research director of the South African National Biodiversity Institute (SANBI – previously the National Botanical Institute). They discussed the idea of mobilising all major herbaria holding African material to digitise the type specimens in their collections for free dissemination of the images and associated information, of all the plants of Africa. The proposal matched an earlier concept for a *Types of African Plant Names* project that Gideon Smith had been developing – but the funding required was considerable.

But Robertson was not daunted. At that time, the Andrew W. Mellon Foundation was actively supporting initiatives to advance and preserve knowledge and to improve teaching and learning through the use of digital technologies. For African botany, it was a case of good luck and good timing. After a quick return to New York, Robertson was back in South Africa the following week, and met with me, as Chief Executive of SANBI, to test his ideas for a collaborative project involving Kew, SANBI and the Mellon Foundation as initial partners. The network, if his proposals were accepted, could be expanded to embrace all African and major northern hemisphere herbaria. On behalf of SANBI, I immediately agreed, and within months the proposal was tested with the leaders of over twenty African herbaria and international collaborators on the flora of Africa.

Gathered for the 17th meeting of the Association for the Taxonomic Study of the Flora of Tropical Africa/*Association pour l'Etude Taxonomique de la Flore d'Afrique Tropicale* (AETFAT) in Addis Ababa in September 2003, the directors of Africa's key herbaria convened an impromptu meeting to consider Robertson and Smith's proposal. The then director of Kew, Peter Crane, chaired the meeting, and outlined the proposal, which was eagerly received by all participants. That same evening a formal proposal was prepared by Gideon Smith, discussed the next morning with Alan Paton of Kew, and within the week this had been submitted to the Andrew W. Mellon Foundation and approved for funding. Never before in the history of botany in Africa had a major project been so rapidly conceived, formulated, scrutinised by peers from across the continent and approved for funding (Smith 2004; Smith and Figueiredo 2010; Smith et al. 2011; Nic Lughadha and Miller 2009).

The African Plants Initiative (API) moved rapidly, building on the experience of SABONET, with NBI/SANBI providing much of the guidance for African herbaria (Walters et al. 2010). A meeting of partners was held at Kirstenbosch in February 2004, and subsequent meetings in South Africa (Fig. 6.5), Cameroon and Kew guided the programme to success. By the end of the API project in 2008, 291,289 images of specimens were available electronically, 51,822 from African, 231,171 from European, and 8296 from North American herbaria (Smith et al. 2011).

Guided by an earlier user needs assessment (Steenkamp and Smith 2002, Fig. 6.6), the combined activities of SABONET and the African Plants Initiative stimulated a number of satellite projects, such as the checklist of the flora of sub-Saharan Africa (Klopper et al. 2006b, Fig. 6.7); a checklist of the flora of Angola

**Fig. 6.5** Plant taxonomists from 45 partner institutions meet in Kirstenbosch, Cape Town, for the 5th African Plants Initiative workshop, November 2008. (Photo: Chris Cupido)

(Figueiredo and Smith 2008; Smith and Figueiredo 2010) and of the lycophyte and fern flora of Africa (Roux 2009).

What had seemed an insurmountable challenge in 2003 – to digitise the type specimens of sub-Saharan Africa's over 50,000 species – was completed by 2008 through a network of 73 global partners and was available, electronically, to the world botanical research community. This vast Africa plants electronic database is hosted by JSTOR, a subsidiary of Ithaka, a not-for-profit organisation founded by the Andrew W. Mellon Foundation and dedicated: "to help the academic community use digital technologies to preserve the scholarly record and to advance research and teaching in sustainable ways." The products of the API are available online to participating African institutions at JSTOR Global Plants website http://plants.jstore.org.

## 6.5 The African Plants Initiative Tradition Expands to Latin America and Australasia

The success of the API led the Mellon Foundation to add its support to a similar initiative, the Latin American Plants Initiative (LAPI), which together with the API, soon morphed into the Global Plants Initiative (GPI) (Ryan 2013). The global reach and influence of the herbarium digitisation agenda and the chain of activities linking API to LAPI to GPI is no better illustrated than the timely access to Mellon Foundation support by Australian herbaria to digitise their collections. During the

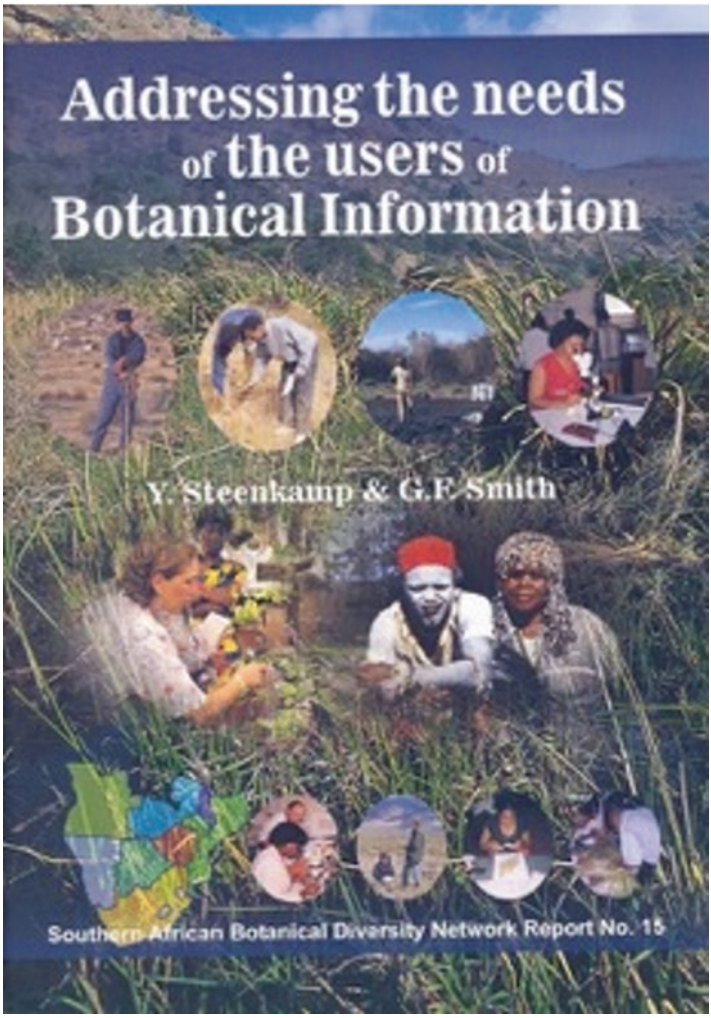


**Fig. 6.6** Volume 15 of the SABONET Report series identified the user needs for botanical information. (Steenkamp and Smith 2002)

global financial crisis of 2008, the Australian government was investing in national infrastructure capabilities, including the Atlas of Living Australasia (ALA). The Mellon grant of US$540000 helped launch what was to become a major programme of biodiversity information systems – fortuitously at the moment when such a catalyst was critically needed. The grant facilitated the acquisition of imaging equipment and supported the digitisation of 71,281 types. In the words of David Cantrill, Executive Director, Science, at Royal Botanic Gardens Victoria, the GPI: "Is a phenomenal resource for the Plant Systematic and Taxonomy Community. Staff in my institution use it continually. Australian herbaria continue to supply type images to JSTOR." (Cantrill, pers. comm. 2019).

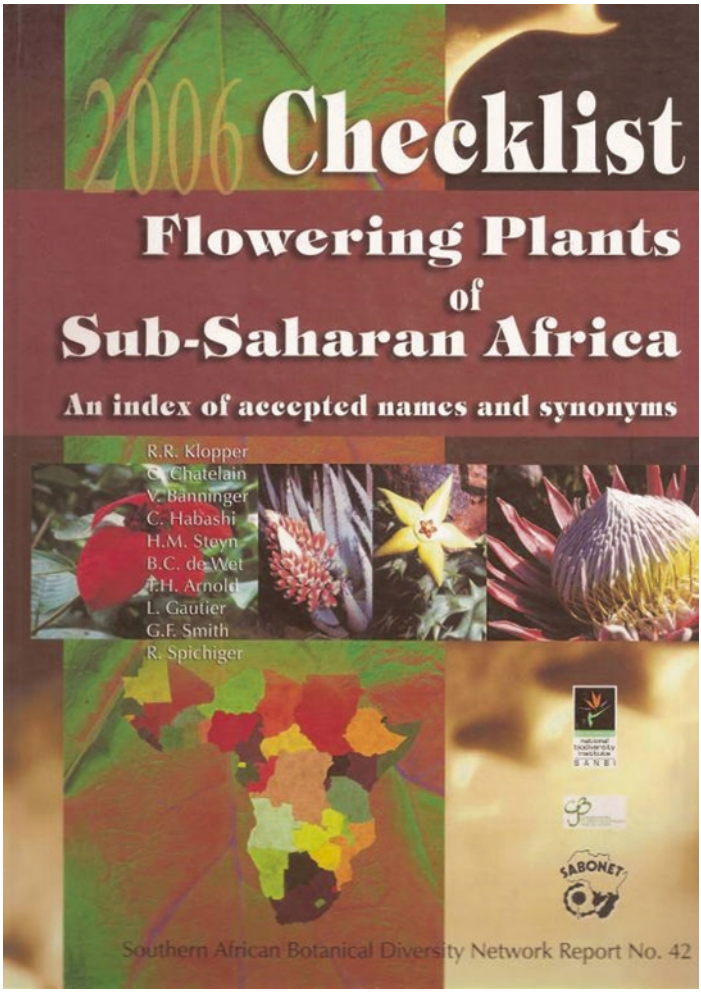


**Fig. 6.7** Volume 42 of the SABONET Report series provided the first comprehensive checklist of the 50,136 species of sub-Saharan flowering plants. This listing formed the backbone of the African Plants Initiative. (Klopper et al. 2006b)

By 2017, at the conclusion of Mellon Foundation funding, the consortium of initiatives involved 329 partner herbaria worldwide, imaging and data-basing over 2.4 million herbarium sheets including nomenclatural types ('type specimens'), historic and original material, and specimens of plants endemic to a single country. Following the model of the API, the GPI products are hosted by JSTOR, in Global Plants – the world's largest database of digitised plant specimens and associated information. The investment by the Andrew W. Mellon Foundation in the suite of projects – (API, LAPI and GPI) – over 14 years of feverish activity, was several score million dollars, making possible unprecedented advances in the access to knowledge and training for botanists across Africa and beyond (Victor et al. 2016).

Unlike many multi-national projects funded by agencies such as GEF, UNDP, UNEP, etc., a formal and independent terminal review of the results and impact of the privately funded API and GPI has not been undertaken. The enormous value of the programme, however, is seen in the daily use of the digitised herbarium specimens by researchers around the globe. An early assessment was that of Nic Lughadha and Miller (2009) within a broader review of digitised botanical information. With reference to the API and GPI, these authors note: "Arguably the most significant innovation in electronic resources for botanists in the past decade has been the ability to capture, store and present high-quality images of the objects of interest, rather than simply recording the metadata relating to that object. This change, enabled by cheaper imaging technology, improved file compression standards, reduced storage costs and far-sighted funders has had a profound impact on the development and utility of botanical databases."

The evidence base is clear: the application of digitised herbarium resources has served to advance many fields of botanical research, functional ecology, climate change and biodiversity conservation in Latin America (Willis et al. 2003; Nic Lughadha and Miller 2009; Canteiro et al. 2019), Africa (Greve et al. 2016); and Australasia (Cantrill 2018).

## 6.6 Lesson Learned from the African Plants Initiative

In common with SABONET, the African Plants Initiative owed its success to a coincidence of many factors. These included:

- User demand for the product (from African taxonomists and conservationists needing easy access to information);
- Intellectual and institutional leadership (from Kew/SANBI/Mellon and the AETFAT membership);
- Innovation (the HerbScan device developed at Kew);
- An already tried and tested model for African collaboration (SABONET);
- Global policy incentives (CBD); and
- Generous, flexible and sustained funding (Andrew W. Mellon Foundation).

From the humble beginnings and tentative discussions of botanists in Maputo in February 1990, through the difficult and frustrating search for funding to establish SABONET, the experience gained in southern Africa stimulated a momentum that embraced similar initiatives around the globe. Plant taxonomists have overcome many of the serious impediments to their profession, and herbaria now serve a much wider spectrum of users in biodiversity conservation, environmental management and sustainable use of living resources. Herbaria and plant taxonomy have now entered the mainstream of modern approaches within the environmental sciences.

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