



Annual Report and Accounts (Financial Statements)

For the Year ended 29 February 2020



THE GOBABEB TRUST

Trust Registration Number T53/98 (Namibia)

Message from the Chair of the Board of Trustees

It is my pleasure to once again report on behalf of the Board of Trustees, as to progress at the institute during the 2019/2020 financial year. In my previous report, I highlighted specific issues that impacted on Gobabeb's operations at that time. These have remained largely relevant during the current year - and I shall provide a brief update on these here.

Firstly, and despite our projections, the full implementation of the revised legal and operational frameworks for the institute was unfortunately not achieved. The registration of the amended and restated Deed of Trust for the Gobabeb Trust, together with the certification of new Trustees was pending at the Master of the High Court through 2019. Early in January 2020, the Amended Trust Certificate was received. Our Trust Administrators, Ellis Shilengudwa Inc., have been unstinting in their support; and have been liaising regularly with Gobabeb management, while patiently tracking the applications through the legal processes.

A noteworthy amendment is the revised governance structure of the Trust, which now allows for broader representation of relevant organisations, and for specific skills and expertise to be identified and incorporated in this body. A minimum of six certified Trustees must be in place to represent a legal Board of Trustees. Unfortunately, during the protracted registration process, some nominated Trustees resigned, while additional nominations were received from identified institutions. New nominations have been tendered for certification and we eagerly await the process to be concluded by the Master of the High Court in order to arrange for an inaugural meeting of the new Board of Trustees.

With the appointment of new Trustees, representing an expanded stakeholder base, we have had to relieve some long-serving Trustees from their governance role. We recognise their contribution over many years and anticipate that they will all be steadfast in

their support as champions and friends. In particular, we hope to continue to draw on the vast experience of Dr Mary Seely, and her profound passion for the Namib Desert, by inviting her to retain her close ties to Gobabeb in the capacity of Patron. Mary is synonymous with Gobabeb, having invested decades into the expansion of the institute and the global recognition of its scientific credentials. We look forward to her continued involvement as wise elder and loving parent.

A new twenty-year renewable cooperation agreement between the Trust and the Ministry of Environment and Tourism (MET) has been endorsed by the Office of the Attorney-General. This agreement operationalises the Trust and clearly stipulates the roles and responsibilities of both Parties, particularly pertaining to the facilities at the Gobabeb campus in the Namib-Naukluft Park (NNP). Our aspiration for this collaboration is to generate, avail and apply science-based evidence in conservation strategies in the Namib *sensu lato*.

In this regard, I have taken note of the joint activities planned and implemented between the MET and Gobabeb, and supported by development partners. In particular, the on-going collaboration with the giz-BMCC II project has stood out – and the deliverables from these combined efforts are to the mutual benefit of all parties, as well as a growing number of beneficiaries. The annual Youth Environmental Summit, as well as infrastructural development (as reported elsewhere), are strong evidence of this partnership. In the same vein, we are eagerly anticipating the involvement of Gobabeb in the NamParks V project, an initiative co-funded by the Federal Republic of Germany. The infrastructural support provided will allow for the construction of staff accommodation, and significantly increase the capacity to house junior staff and interns at the institute.

In her report, the Executive Director will highlight some achievements of the institute during the period under review. Technical summaries will further elaborate on the outputs of research and learning operations. Again, kudos should be given to the small team at Gobabeb, who continue to perform despite the challenges of a constrained economy and limited resources. A strategic approach to bring on board a greater number of Namibian graduates and encourage their registration for postgraduate studies allows for an uninterrupted execution of routine research activities, while developing local scientific capacity. Incentivising internships in this way, certainly makes working in a remote location, without the city advantages, much more attractive to our emerging scientists. This is a legacy that is unparalleled anywhere else in the country, and one for which the institute can be justifiably proud!

With the economic situation continuing to look bleak, the challenge remains for Gobabeb

to secure the necessary resources to not only maintain the status quo, but to further grow the institute. Fundamental to this projected growth is a committed income stream, supplemented by innovative alternatives in support of a balanced budget, allowing for investment as well as recurrent activities. It is in this regard that the incoming Board of Trustees can make the most meaningful contribution to a sustainable future for the institute. Our new incumbents collectively have the skills, experience and networks to take up this particular challenge. Working together with the Gobabeb management team, and our stalwart development partners and stakeholders, this aspiration for Gobabeb can be realised. This should be the primary goal we set ourselves as we enter a new era for the Gobabeb - Namib Research Institute.

Teofilus Nghitila
Chairman

Report of the Executive Director

Gobabeb is a catalyst for gathering, understanding and sharing knowledge of arid environments, with a mandated focus on the Namib Desert. Our vision is to contribute to a realisation of the universal value of the Namib Desert, in its broadest sense. It is within this context that we would like to share achievements during the 2019/2020 financial year. Detailed information on activities and achievements is provided on pages 7–17.

Economic analysis suggested that 2019 would be the deepest recession in the history of independent Namibia, with growth expectations being dismal. It is within the limitations of this national economic context that Gobabeb continued to operate. Anticipated financial support from government through the approved NCRST Capacity Building Grant did not materialise, while support for infrastructure through the

MET operational budget was sufficient only to plug the most pressing maintenance gaps. However, prudence in expenditure allowed us to continue operations as usual; while management explored all opportunities to stretch the budget as well as land new projects.

The tenacity of Gobabeb to overcome such times is best reflected in its staff. When the going gets tough, the tough get going, and keep going... What a team! Undeterred by constraints of limited resources, they have delivered above and beyond what can be expected under the circumstances. I am personally in awe of the energy, commitment and talent I see around me on a daily basis. Some vacancies have remained unfilled, and additional workloads have resulted in longer hours and more responsibility – which has been embraced by most. The throughflow of short-term interns has offered some relief, and

we hope that these young Namibians have taken away lessons of duty, dedication and hard work that will benefit their future employers. Our junior staff are encouraged to pursue further studies during their tenure and ten are currently registered candidates (2 PhD; 8 MSc), which is part of the package that Gobabeb provides in optimising time spent in the desert. Our alumni continue to do us proud as they take up opportunities elsewhere at the end of their contracts or training courses. The reach of Gobabeb as manifested through the alumnus network is extraordinary, and I continue to be amazed when encountering Gobabebians in the most unexpected of places and circumstances!

Slow progress with the registration of the amended Deed of Trust, and signing of the draft collaboration agreement with MET, has been disappointing, although it has not impeded operations. However, we are anxious to start engaging with our new governance structure and drawing on their wisdom, perspectives and leadership to strategise a sustainable way forward for Gobabeb. Our Trustees have an important role to fulfil and it will be both reassuring and a privilege to have this designated group of highly regarded individuals, representing our most important partner organisations, firmly in the Gobabeb corner.

The Gobabeb research network continues to strengthen and expand. After thorough consultations and negotiations, new service agreements to support instrumentation hosted on site at Gobabeb were signed with the Leibniz Institute for Tropospheric Research (TROPOS) in Germany and the National Physics Laboratory (NPL) in the UK. The service agreement with the Karlsruhe Institute of Technology (KIT), Germany, was formally extended and a similar extension will be soon concluded with the Max Planck Institute (MPI), Germany. Several additional partnerships have been conceptualised and initiated, with scaling up of joint activities anticipated in the next financial year. These include the fitting and equipping of a dedicated aerosol laboratory in association with North-West University in

South Africa and the CNRS - Laboratoire Inter-universitaire des Systèmes Atmosphériques in France.

Some initial interactions with potential new research partners in 2018 matured during 2019. In particular, incipient collaboration was advanced with the University in Bonn in Germany, as well as Fairy Lake Botanical Gardens in the People's Republic of China. Gobabeb has been initiated into a consortium investigating plastics in deserts, lead by the University of Plymouth in the UK. With these new collaborators as well as together with our longstanding research partners, projects have been jointly designed and submitted for funding in response to various calls. Some nine such collaborative proposals were developed; while Gobabeb developed an additional three proposals as sole PI. Three new projects were approved for funding: biodiversity monitoring in collaboration with NUST and the University of Hamburg; rainfall isotopic study through the International Atomic Energy Agency; and development of MOOCs with the US Ambassador's Fund for Cultural Preservation. Our long-term project through the Fund for Local Cooperation (FLC) of the Finnish Embassy on benefit-sharing in the Namib Sand Sea was concluded, drawing to a close a successful and impactful project partnership. We do appreciate the many years of support that we have enjoyed through this funding mechanism, particularly for our efforts in Education for Sustainable Development, and sincerely hope that there will be opportunities to work with FLC in the future.

In hosting Fulbright Scholar and world-renowned meteorologist, Prof. Sharon Nicholson, during the latter part of 2019, the merits of this scholarship to complement Gobabeb's research agenda and swell deliverables from the institute become clear. We have subsequently supported the Fulbright applications of an additional three USA-based scientists for 2021, hopeful of a successful outcome.

Despite our budgetary woes, Gobabeb's research output remains healthy and

continues to increase. Research carried out over past years at Gobabeb, and data collected through the array of instruments hosted by Gobabeb and maintained by our staff, resulted in 48 peer reviewed papers and eight theses being completed in the 2019 calendar year (page 27). Thirteen postgraduate studies are currently being conducted at Gobabeb.

Gobabeb also hosted several scientific symposia and workshops. Prof. Don Cowan of the Centre for Microbial Ecology and Genomics (CMEG) at the University of Pretoria celebrated a decade of microbial research in the Namib through an extraordinary symposium in April 2019. The international "HotBirds" programme took stock of their research over the past decade and planning of new initiatives through a science symposium and workshop in July 2019. Unfortunately, a planned symposium to share results from the NaFoLiCa project in September 2019 was cancelled, but Gobabeb still hosted seven colleagues from various Chilean institutions working in the Atacama Desert.



A high-level review and strategic planning workshop of global environmental coordinators of the UNDP in October 2019, prompted us to upgrade our conferencing facilities. This allowed for real-time participation of experts from across the globe. We shall now always fondly remember this group when we hear the familiar refrain of The Eagles' "Hotel California" (see box). We were also pleased to host a workshop for Namibian institutions involved in climate change adaptation and mitigation organised by UNDP in January 2020.

HOTEL GOBABEB
(Sung to the tune of Hotel California)

*On a dark desert highway
Cool wind in our hair
Warm smell of the Namib
Rising up through the air
Up ahead in the distance
We saw a shimmering light
We all got excited,
and we started to smile
We had come a long, long way
So many, many miles
We had travelled from far away
And we were all thinking to ourselves
"How lucky we are to be here today"
Then we put on our sandals
And they showed us the way
There were voices from across the dunes
We thought we heard them say*

*"Welcome to the Hotel Go-babeb
Such a lovely place (such a lovely place)
Such a lovely place
Plenty of room at the Hotel Go-babeb
Any time of year (any time of year)
We can find life here"*

UNDP EBD Global Team meeting 2019

As an integral component of the research process, training remains a core function. Environmental education programmes at Gobabeb remain popular, and we received 13 schools (12 Namibian) and 11 university groups (3 Namibian, from different UNAM campuses) on site during the past year. Many of these education partners are repeat visits and we greatly appreciate their loyalty to and the affirmation of Gobabeb's training credentials. A total of 435 learners and 296 university students participated in Gobabeb training programmes during the period under review.

In addition to the above, Gobabeb also pursued its own flagship training interventions. The annual Youth Environmental Summit (YES), generously supported by the MET/giz-

BMCC II project, targeted senior secondary schools (Grade 11) in the West and East Kavango Regions. The Gobabeb Training and Research Internship Programme (GTRIP) exposes university students to research methodologies. Sadly, support for this programme from Langer Heinrich Uranium (Pty) Ltd. came to an end due to economic constraints and the temporary closure of the mine. Training of Namibian and international postgraduates on specialised physiological research techniques (Biophysical Field Methods [BPFM]) during June 2019 and February 2020, as well as work-integrated learning opportunities for NUST and UNAM students rounded out the specialised training agenda for the year.

Creating awareness through involving the public in our research effort is another learning strategy. We were pleased to host excursions by the Botanical Society (21 members, August 2019) and the Namibian Scientific Society (31 members, October 2019). Organised field-based data gathering activities, guided tours to areas of special interest, and a programme of lectures were well received. We appreciated the donations from both groups that have been invested in staff development and the purchase of field equipment. In addition, staff and science visitors continue to share their knowledge via public platforms at the coast, as well on site.



BotSoc monitored *Welwitschia* at the Hope Mine site

Gobabeb's social impact is largely measured through our services to the local Topnaar community. In addition to the annual,

one-week training of learners from the local primary school at Utuseb, currently in its seventh iteration, our partnership with Dartmouth College, USA, provides the means to support three Topnaar learners to attend high school in Swakopmund. On-going research provides evidence-based advisories to livestock farmers along the Kuiseb, with a current emphasis on animal health and human-wildlife conflict. A long-term, multidisciplinary research programme to explore the agronomic potential of Inara is ongoing. Gobabeb provided logistical support for a Topnaar community visioning workshop to identify and define the key development aspirations in November 2019.

MET is a key strategic partner for Gobabeb. We continue to provide scientific services to support the management of the Namib-Naukluft Park, and offer our facilities to those park-based officials operating in the Gobabeb surrounds. We anticipate that the NamParks V project will further cement our partnership. The four duet units, planned for construction under this initiative, will offer comfortable accommodation to our junior staff. Although it is with some whimsy that we shall finally decommission the caravans, a Gobabeb institution and rite of passage for all our interns, the current occupants will probably argue that their replacement with more suitable accommodation is long overdue. We look forward to working with the contractors and professional team to realise this long-awaited development.

Much of the existing and aging campus infrastructure requires renovation as the extreme desert conditions are taking their toll. With limited resources available, we are prioritising the most urgent maintenance needs. For example, the upgrade of solar-generating capacity for our expanded battery bank was generously supported by our constant development partners, giz via their Biodiversity Management and Climate Change (BMCC II) project.

Gobabeb is fortunate to garner financial support from diverse sources. These include

development partners; grant-awarding organisations; government O/M/As; industry, particularly in the mining and tourism sectors; as well as our research collaborators and individuals eager to contribute to our work. Our gratitude to these many sponsors is immeasurable. We hope that they can recognise the translation of their generous investments into the results reported here.

An exciting but challenging time lies ahead for Gobabeb. We have a new framework for operation; a refreshed governance structure; a growing network of science partners; a multitude of talented graduates seeking association with the institute; and a never-

ending raft of research questions waiting to be investigated.

However, at this same time of great promise and optimism for Gobabeb, a short paragraph appeared at the bottom of in the News Ticker column, page 9 of the *Time Magazine* of 02 January 2020: “China fights mysterious illness”.

Time will tell how unfolding international events will affect Gobabeb during 2020!

Dr Gillian Maggs-Kölling
Executive Director

Report of the Board of Trustees

The Gobabeb Board of Trustees has pleasure in presenting their annual report and accounts for the year ended 29 February 2020.

Organisation and Governance arrangements

Gobabeb is a registered Trust (T53/98). An amended and restated Deed of Trust was approved by the Master of the High Court on 07 January 2020. The Trust operates under the name *Gobabeb – Namib Research Institute*, which reflects its geographical location, mandate and scientific reputation.

Ellis Shilengudwa Incorporated are the appointed Trust Administrators for the Gobabeb Trust, a service they provide *pro bono*.

A new cooperation agreement between the Gobabeb Trust and the MET was reviewed by the Office of the Attorney General and endorsed for signature. The cooperation agreement continues to provide access to the facilities in the Namib-Naukluft Park to the Trust under certain terms and conditions, encourages an expansion and diversification of research activities and promotes a closer

partnership for the benefit of the management of this protected area.

Statement of Trustee responsibilities

The Trustees are responsible for preparing the Trustees’ Report and the financial statements in accordance with applicable law and accounting standards, i.e. International Financial Reporting Standards for Small and Medium-Sized Entities (IFRS for SMEs).

The law applicable to Trusts in Namibia requires the Trustees to prepare financial statements for each financial year, which give a true and fair view of the state of affairs of the Trust and of the incoming resources and application of resources of the Trust for that period.

The Board of Trustees is furthermore responsible for setting out the strategic direction of the institute and assisting with defining its priorities. It also approves the terms of reference, appoints, and monitors the work of the Executive Director, to whom all operational matters are delegated. The Board endeavours to meet at least three times a year

to carry out its decision-making and strategic responsibilities.

Gobabeb Governance

The governance structure of the Trust has been amended to broaden participation and acquire specialist skills to enhance the capacity of the Board to provide appropriate guidance to the operations of Gobabeb.

The Board of Trustees consists of no fewer than six and no more than ten Trustees. These Trustees shall include the following: Two representatives from MET; Two representatives from Namibian-based universities; One representative from a national agency responsible for research in Namibia; One representative from an NGO with a research track-record; One representative from a regional or international organisation of repute; One representative from private sector with business, legal and/or financial expertise.

In anticipation of reconstituting the Board of Trustees in line with the amended and restated Deed of Trust, selected institutions were approached to nominate representatives to serve as Gobabeb Trustees via the office of the Chairman.

Nominations were received and formal applications were submitted for registration of the following Trustees:

Mr Teofilus Nghitila, MET (Chair)
Dr Anna Matros-Goreses, DRFN

Dr Tjama Tjivikua, NUST (until April 2019)
Prof Isaac Mapaure, UNAM
Mr Charles Loots, B2Gold/Private Sector

Dr Mary Seely, as the only original Trustee from 1998, submitted the request for registration of the amended Deed of Trust on behalf of the Board.

A nomination for a seat on the Board is still pending from the NCRST, as the national agency responsible for research in Namibia.

Due to delays in the registration process, the new Board of Trustees was not able to legally meet during the period under review. The Executive Director periodically updated the Board Chair on progress at Gobabeb.

Management

The Executive Director at the end of February 2020 was Dr Gillian Maggs-Kölling. The Executive Director is responsible for the day-to-day management of the Institute's affairs and for implementing policies and strategic advice endorsed by the Board of Trustees. She is supported by a small but dynamic management team, which consisted of the Research Manager (Dr Eugene Marais), the Office Manager (Ms Elna Irish), and the Accountant (Ms Ileni Hiwilepo). Technical advice is solicited when required from experts and associates in various sectors, including science, natural resource management, infrastructure development and tourism.

Activities and Achievements in 2019/2020

Strategic

A five-year Strategic Plan (2017–2021) provides the requisite implementation framework for Gobabeb. This plan informed

the annual operational planning and budgeting for Financial Years 2019/2020 and 2020/21, based on eight strategic objectives in the following four key areas:

- Financial Sustainability;
- Stakeholder Relations;
- Research Excellence; and
- Human Capital.

Research

Despite the fiscal realities of a zero-budget implementation and ensuring frugal research expenditure, Gobabeb continued to be busy. Research partners from all over the world visited, while Gobabeb's own scientists carried out considerable research and engaged with a wide variety of outreach activities, including technical support for international documentary film teams, practical training of university groups and hosting local and international science information events.

The common denominator was the Gobabeb - Namib Research Institute's focus on pursuing, supporting and facilitating science. Gobabeb's most important asset is motivated and suitably qualified personnel to pursue short-term investigations and support long-term research within the context of past achievements of the institute as well as contemporary knowledge and perspectives. Consistent results and continuity are based on forward planning, scheduling and prudent application of resources for on-going training, equipment acquisition and judicious project design to make best use of the resources at hand. The continued growth in research output (pages 27–32) and visiting researchers suggests that Gobabeb is fulfilling its purpose.

Gobabeb encourages and supports staff research, particularly for higher qualifications. At the end of the reporting period, six staff and research associates at the Gobabeb campus and four NERMU team members was engaged in formal studies (pages 19–20), while nine students associated with Gobabeb submitted theses during 2019 (see Bibliography, Annex I). Four of these were Namibian (Ms Angela Curtis [MSc with distinction, UNISA], Mr Natanael Ndilenga [BSc Hons, UNAM], Mr Naili Fudeni [B. Geo-Info. Tech. Hons, NUST], and Mr Paulus Ndinoshiho [BNRM Hons, NUST]). Two

engineering students, Ms L. Bassi and Ms S. Odelfelt, visited Gobabeb to gather data for their Masters study (Mälardalen University, Sweden); Ms. A. Bialek completed her PhD (University of Surrey, U.K.) based on the establishment of the NPL RadCalNet satellite validation and calibration site at Gobabeb; Ms G. Collins completed her PhD (University of Waikato, New Zealand) on springtail diversity in the Namib Desert, and Mr B. Adhikhari completed a Masters degree (Indiana University) on how soil moisture may contribute to fog and dew moisture in the Namib.

The beginning of 2019 brought about the bittersweet end of an era when the Gobabeb First Order Weather Station (FOWS) was closed down by the Namibian Meteorological Service - the last operational FOWS in Namibia to do so.



The last First Order Weather Station Team, March 2019.

Meteorological information at Gobabeb, collected since 1962, constitutes the longest continuous dataset that was collected at the institute. It was inevitable that the inexorable march of research outcomes, new instrumentation and technological progress would replace traditional ways of data collection. Hence, the Gobabeb MET Automatic Weather Station (AWS) has been in operation since 2014 in order to allow smooth transition from a manned FOWS station to a full spectrum research-grade meteorological data collection protocol that continues the same range of meteorological variables at a much finer scale and with greater accuracy.

However, the weather observation tradition continues at Gobabeb. There is still a

place for the observational skills and discipline learned by doing daily meteorological observations, while the Gobabeb FOWS also feature prominently in the institute's schools training programmes. Gobabeb staff still monitor a suite of meteorological variations at the FOWS to continue the skills, knowledge and sensitivity to the environmental conditions that affect the ecological rhythms of the Namib.

Meteorological information is just one of the long-term monitoring initiatives that Gobabeb strives to continue, and judiciously expand. Regular monitoring and data collecting are the core of recurrent activities at the centre, which also include maintaining research equipment, providing technical support to international partner organisations and carrying out investigations and data collecting for shorter term outcomes. Gobabeb strives to identify areas where it can make an international as well as local contribution, particularly where the institute can interact with international partners and global initiatives that will benefit our student research associates and staff as a mechanism for knowledge transfer and experience.

Gobabeb's restoration unit, NERMU, has continued with its biodiversity research and monitoring programme at Husab, funded by Swakop Uranium (SU). The programme consists of two main legs, namely monitoring impacts on vegetation health; and research into specific issues defined in the mine's EIA. The latter includes two PhD projects looking at the ecophysiology of riverine trees (Ms Elbe Becker) and *Welwitschia mirabilis* (Ms Paulina Fendinat), respectively and two Masters studies, one on the ecological engineering role of gerbils (Mr Halleluja Shaanika) and one modelling study on the geographic distribution of the locally endemic Husab sand lizard (Mr Jonas Lipopela).

Monitoring was done during two field campaigns, in April-May and October-November 2019. The core activity is an assessment of the health of riparian vegetation (relative to ground water abstraction), two

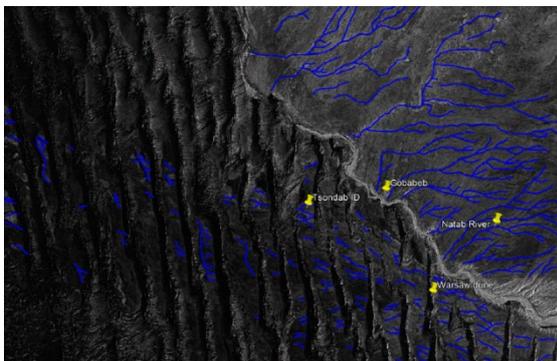
gravel plain shrub species (relative to levels of mine-generated dust) and *Welwitschia* (in the context of the species' water supply).



Additional *ad hoc* studies were done as required. For example, in 2019 a short survey was conducted on the health status of old camel thorn (*Acacia erioloba*) trees that were impacted by the permanent access road of the mine. A survey of zebra spoor on the gravel plains, the third successive study since 2009, aimed to determine whether the mine's footprint has affected zebra movement and migration patterns. The NERMU team also conducted several training and environmental awareness events for the SU staff.

In addition to our established projects, Gobabeb is eager to develop new research initiatives. Securing sources of income is of course important, but even more important is to identify focal areas for future research as a context for capital investment in human and infrastructure capacity. Thus, a core function of the institute's leadership is to ensure ongoing review of the institute's strengths and strategic needs, as well as continuous scoping of global and national research opportunities relevant to the institute's abilities. When suitable opportunities are identified, Gobabeb consults and engages with potential partners to formulate projects with achievable objectives. Gobabeb prepared and submitted 12 proposals for research or capacity building to various agencies and foundations during 2019/20. Outcomes for most of the proposals are still pending as they are still under review.

Many of the institute's accomplishments had modest beginnings, based on the establishment and nurturing of partnerships. Gobabeb therefore explored and encouraged a number of new collaborative projects during the year. In recent years, several new partnerships for the validation and calibration of sensors carried by Earth Observation Satellites were established. As a result, data from monitoring systems at Gobabeb, and maintained by Gobabeb staff, features prominently in remote sensing and technical reports on radiometric calibration, e.g. the more recent Landsat and Sentinel series. During 2019, a new partnership with the University of Bordeaux and the European Space Agency was further developed for the validation of the Biomass P-band Synthetic Aperture Radar (SAR) satellite to be launched in 2021. The partnership intends to carry out ground and airborne observations at Gobabeb during 2021 as a baseline for post-launch assessment of the sensors on the Biomass satellite. Attempts to engage and generate early interest from Namibian institutions active in remote sensing and space science were unsuccessful, though efforts continue. The primary purpose of the Biomass mission is to quantify and monitor global carbon fluxes and aboveground biomass and forest and wetland health. A further goal, called DesertSAR, intends to map subsurface geomorphology in arid areas, with specific reference to palaeo-drainage systems and shallow aquifers.



Radar satellite image revealing drainage system

Furthering our earth observation activities, another sun spectrometer was operationalised in collaboration with the Karlsruhe Institute for Technology (KIT), a long-standing partner. The

sun spectrometer allows for the quantification and seasonal monitoring of Greenhouse Gas concentrations (GHC) throughout the atmospheric column (troposphere, stratosphere and mesosphere), which can then be compared to those measured by satellite sensors such as on the GOSAT and OCO-2 platforms. In addition, a continuous Airborne Atmospheric Particulate Matter (APM) sampler was installed in collaboration with the Laboratoire Interuniversitaire des Systèmes Atmosphériques, Paris-Est Créteil University, and North-West University in South Africa. This additional instrumentation further complements and expands the existing long-term monitoring of atmospheric particulate matter and aerosols at Gobabeb that was reported on in the previous annual report.

Closer to the ground, Gobabeb hosted several scientific symposia during 2019, with several more planned in the coming years. One of our outstanding research partners, the Centre for Microbial Ecology and Genomics (CMEG), based in Pretoria, South Africa, have been working for a decade on the microbial ecology of the Namib with collaborators from all over the world. In celebration of their 10th anniversary of work, CMEG arranged a mini-symposium in April 2019 with presentations from a range of high profile international researchers at Gobabeb attended by Namibian subject specialists and students from our universities. The event has already resulted in some new partnerships and research collaboration that benefit Namibian scientists. A follow-up visit by Prof. Don Cowan in November 2019, introduced us to colleagues from the Westerdijk Fungal Biodiversity Institute in the Netherlands, with whom we anticipate future, fruitful collaboration.

This microbial ecology symposium was followed a month later by another mini-symposium, again celebrating ten years of research, this time arranged by the Hot Birds Research Project, coordinated through the University of Cape Town and University of Pretoria. That initiative investigates the physiological and behavioural coping mechanisms of arid-zone birds to climate

change. Researchers from all over the world, including Gobabeb's student researcher working on Namib dune larks, Ms Jessica Roberts, gave a series of fascinating presentations.

Another mini-symposium scheduled two months later, intending to share results from the Namib Fog Life Cycle Assessment (NaFoLiCA), was unfortunately cancelled due to a perceived lack of interest. Various researchers that planned to attend visited Gobabeb, including a team from the Atacama Desert Research Station (Centro del Desierto de Atacama de la Pontificia Universidad Católica de Chile). Despite the disappointment of the cancelled event, it provided an opportunity for productive information exchange between specialists from two similar desert systems.



Several new projects were initiated during the year. Dr Richard Washington (University of Oxford) kindly donated two Davis weather stations to Gobabeb, which were used to expand the Central Namib meso-array by re-establishing weather stations near Utuseb and Klipneus to better understand the influence of the Kuiseb depression on meteorological dynamics. A DJI Phantom quadcopter adapted to carry a Sequoia multispectral camera, donated by the University of Auckland, New Zealand, allowed Ms Ailly Nambwandja, to initiate research on using remote sensing platforms to monitor biodiversity, health and recovery in very sensitive environments where even foot traffic may cause severe disturbance. A small project to examine the isotopic

composition of rain and fog in Namibia in order to clarify the source areas for atmospheric fog, funded through the International Atomic Energy Agency (IAEA), was launched. Initial work was also started on developing content for a Massive Open Online Course (MOOC) on how to assess and document open-air archaeological sites in arid areas. This project is funded through the US Ambassadors Fund for Cultural Preservation.



Oxford students initialising a Davis weather station at Utuseb

Gobabeb received a further donation of 40 trail cameras and a SM4 Acoustic Recorder by the Japan Oil, Gas and Metals National Corporation (JOGMEC) via their Nova Joint Venture social corporate responsibility programme, which is intended to examine Human-Wildlife Conflict (HWC) in farming communities along the lower Kuiseb. The materials arrived too late to be effectively deployed by Mr Ruben Angala, a GTRIP intern that was doing a project on HWC at Gobabeb. The equipment was still deployed to gather information and is being maintained as a long-term dataset will be required to evaluate patterns that leads to conflict. Due to problems elsewhere in the Namib-Naukluft Park, some

cameras were transferred to the park warden to monitor HWC elsewhere in the park.



Dr Katrin Kärner handing over trail cameras

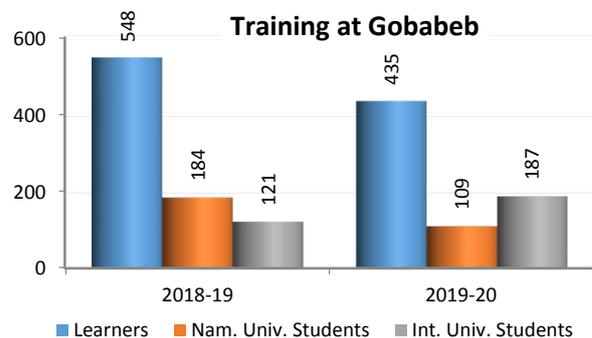
Lead investigators from several research groups visited Gobabeb to explore interest and opportunities for future collaboration. These visits resulted in five project proposals that were prepared in response to a call for research proposals from SASSCAL II, amongst others. Preliminary research to investigate the occurrence of micro-plastics due to the mechanical breakdown of plastic litter led to the development of a large proposal to compare the occurrence and provenance of plastic remains in the Namib and Sahara Deserts.

Despite its lack of relevant professional capacity, Gobabeb still engages with research that may have practical benefit for communities. Gobabeb assisted two students from Mälardalen University, Sweden, to assess the feasibility, limitations and operational requirements of solar-powered water purification solutions for remote communities in Namibia. Although a research capacity building initiative agreed with the NCRST during 2017 is theoretically still feasible, national austerity measures suggests that it is unlikely to materialise. This project intended to develop professional skills while addressing livestock management practices through a

trans-disciplinary approach. Undeterred by this set-back, Gobabeb is exploring other avenues to engage with local communities, for example the HWC project mentioned above. Gobabeb also continued its engagement with the Topnaar livestock owners, in collaboration with the Dartmouth College, USA and the Directorate of Veterinary Services. Gobabeb assisted the majority of Topnaar farmers to register as livestock owners as required by law, and submitted a project proposal to equip and train Topnaar farmer groups in animal health. Throughout the year, Gobabeb was regularly supplying one of the farmer settlements with potable water until their pump was fixed shortly before the 2019 elections. Gobabeb also facilitated a visioning meeting for the Topnaar community, led by Dr Julie Snorek of Dartmouth College and Mr Willem Odendaal of the Legal Assistance Centre to evaluate and consider potential solutions to the challenges facing the community. Sadly, the precarious financial situation under which Gobabeb is operating does not allow a great deal of leeway in material assistance to its neighbours in the Namib-Naukluft Park.

Training

A total of 435 learners and 296 university students participated in Gobabeb training programmes during the period under review.



Three students participated in the six-month internship programme, GTRIP, supported by the last instalment of a five-year commitment from Langer Heinrich Uranium, and co-funded by the Zoological Society of

London and Gobabeb. Interns and projects included:

- Mr Ruben Angala, NUST-WIL, *A study of human-wildlife conflict within the Topnaar community living along the Lower Kuiseb River in the Namib-Naukluft Park, Namib Desert.*
- Ms Ailly Nambwandja, UNAM, *Daily lichen activity response to fog events using drones: A fine scale observation in the central Namib Desert.*
- Mr Natanael Ndilenga, UNAM, *Pollination ecology of Welwitschia mirabilis in the central Namib Desert, Namibia.*

The fourth and fifth iterations of the postgraduate Biophysical Field Methods course were conducted in June/July 2019 and February/March 2020, respectively. This modern approach to skills training combines MOOC/distance learning and site-based field applications. The course is supported by the State University of New York - College of Environmental Sciences and Forestry (USA), Ben Gurion University of the Negev (Israel), funded by the Sillins Family Foundation, and Gobabeb. In 2019, seven students from Namibia, USA and Israel participated and in 2020, 12 students from Namibia, South Africa and Israel engaged with the on-line academic component to learn about methods to determine physical conditions that may affect ecology or behaviour, followed by a field component where they had to apply the academic principles and cutting edge technology to solve ecological questions. Participants were rotated through four projects to ensure maximum exposure to techniques and expertise available. The participation of two Namibian postgraduate students in 2019 and three in 2020 were supported by Gobabeb and the NCRST, Research Capacity Building Grant (funds advanced by Gobabeb).

Gobabeb's annual programme for Grade 11 learners, the Youth Environmental Summit (YES), was held 12th –23rd April 2019, under the International Day for Biological Diversity

theme “Our Biodiversity, Our Food, Our Health”. Conducted in at the Gobabeb facilities, 29 participants were drawn from 10 schools across the Kavango East and Kavango West Regions. This was the first time that learners from these regions were specifically targeted. Three alumni from previous YES events supported Gobabeb staff in guiding the learners to execute three research projects:

- *Nature’s Larder*
- *Nature’s City*
- *Nature’s Bank*



The results of the three projects were prepared as posters and distributed to all participating schools. The learners also presented their findings at a public event in celebration of International Biodiversity Day in Rundu on 24 May 2019. This event, organised by MET, was attended by national and local dignitaries,

officials and local inhabitants. Once again, the giz through the Biodiversity Monitoring and Climate Change (BMCC II) project generously supported YES 2019, while co-funding was provided by MET and Gobabeb. The YES continues to have a significant impact on enhancing understanding of biological concepts and influencing career choices of participants.



Learners from J.P. Brand Primary School

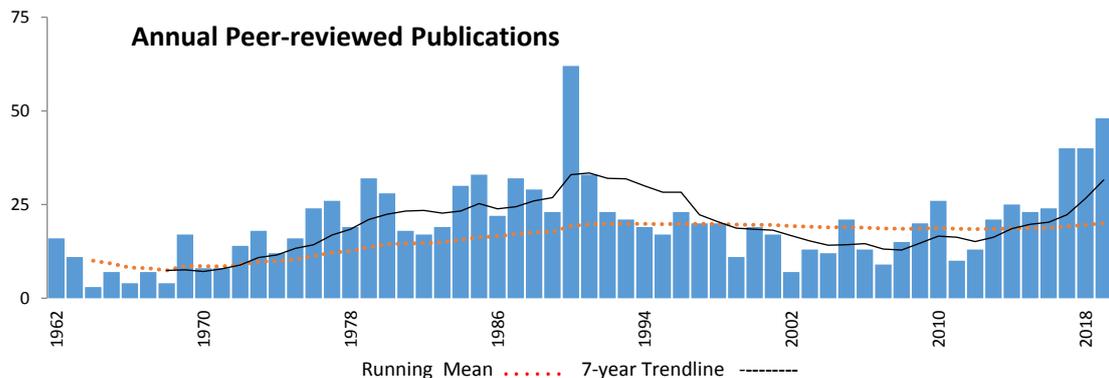
The FLC supported the annual week-long educational outing for the Grade 7 class at J.P. Brand Primary School in Utuseb. Some 37 learners, of which 19 were girls, and their teacher participated in the programme from 3rd to 7th June 2019. The programme consisted of field research exercises conducted in the mornings. Data processing, discussions and other educational activities occupied the afternoons. In the evenings, lectures and educational games and videos were presented. The purpose of this particular training is to create a deeper understanding and appreciation of the environment along the Kuiseb River, while giving hands-on experience in science.

A positive development was university groups, both local and international, incorporating an extended visit to Gobabeb as part of their training syllabi and including Gobabeb researchers as training facilitators. Dartmouth College, USA has pioneered this approach, visiting Gobabeb with students for the 7th consecutive year. “Newbies” to this approach included UNAM Geography; UNAM Wildlife conservation; Loughborough University, UK; Aaniiih Nakoda Tribal College, USA; and UC Riverside, USA. All these courses were highly successful, and all the universities have booked for return visits in 2020.

Publications

Gobabeb closely monitors peer-reviewed publications that explicitly acknowledge the institute, or are produced by our staff, as a widely accepted, objective metric of research output and activity. By this bibliometric standard, Gobabeb is continuing to be productive and to improve. The 48 scientific articles published during 2019 builds on a tradition of academic excellence established over the previous six years. In addition, eight theses based on data collected at Gobabeb, two of which were PhD and three Masters dissertations, were submitted to various universities.

A number of newspaper articles during the year reported on Gobabeb’s work, while several documentary film crews visited Gobabeb to record footage. Two-page, full-colour profiles of two of our researchers (Jessica Roberts; Saima Shikesho) appeared in a local newspaper (*Die Republikein*). Gobabeb



also produced a number of information boards on various aspects of the Namib Sand Sea to improve visitor appreciation of the extraordinary Namib environment through FLC support.

Gobabeb staff and associates shared their results and knowledge through several oral or poster presentations at scientific or public meetings. During an Arid Zone Ecological Forum meeting in Kimberley, South Africa, two of Gobabeb's researchers, Ms Ailly Nambwandja and Ms Saima Shikesho, were respectively awarded with the first and second prizes for student scientific posters. Delays in renewing passports, prevented our sponsored participation at the International Conference on "Biodiversity in Drylands and Wetlands: Challenges and Opportunities in the 21st Century" held in Kenya in September.

At long last, Gobabeb is visible again on the Internet - visit www.gobabeb.org to examine our new site. The institute did not wish to simply re-establish its old website as it was difficult to update and needed improvements to better reflect our core business, but staff did not have the time nor skills for an extensive overhaul and to communicate with hosting agencies. Gobabeb did also not have the resources to contract a media consultant, who would have had to be carefully screened and supported to develop a website that fulfilled our specific needs. Through the kind intervention of our research associate in the USA, Dr Scott Turner, this important communication medium has been re-established and is continually and organically being updated and improved. Gobabeb is also a presence on other social media platforms like YouTube; Twitter; Facebook; TripAdvisor; and Instagram.

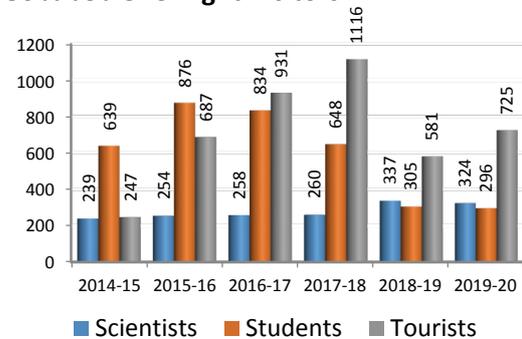
Visitors

Gobabeb hosted 725 general visitors during the period under review. This represents a modest increase in visitor numbers. A considerable number of these visitors were associated with bespoke offerings. A year-long trial by Landscape Tours from South Africa,

visits by the Namibia Scientific Society and Botanical Society of Namibia, and a new Faces of the Namib package boosted the numbers of overall visitors.

A more relevant statistic for Gobabeb, however, is the number of scientists visiting the institute. The 324 science visitors in 2019/20 seem to indicate a sustained interest to work with Gobabeb. As science visitors, on average, stay more than a single night in order to do work, their contribution to the sustainability of Gobabeb's hospitality unit is significant. As during the previous year, the increase in science visitors included a notable increase of scientists from Namibian institutions. There was a 12% decrease in the number of Namibian learners and Namibian university students visiting Gobabeb, from 732 during 2018 to 644 in 2019, which is probably due to national austerity measures. That was offset by a 55% increase in foreign university students, with three new study abroad programmes, specifically coming to Gobabeb.

Gobabeb Overnight Visitors



The CEO and the entire environmental section of Swakop Uranium (SU) visited the Gobabeb campus in August 2019. This presented an opportunity to engage face-to-face with one of Gobabeb's most important investors in our restoration research effort. The focus of this visit was to create awareness of the delicate and diverse ecosystem that exists in the Namib Desert and to provide better context for the research and monitoring required to underpin rehabilitation at Husab. The importance of maintaining ecosystem function and integrity was stressed, as well as

the responsibility associated with utilising natural resources.



Gobabeb continued its efforts to market and attract suitable operators to activate the tourism concession as an additional means of support and income for Gobabeb. As a result of these efforts, Mr Jacques Delpont, the primary operator of the Faces of the Namib concession route, carried out several trial journeys to test client satisfaction. Gobabeb continued to engage and discuss with relevant stakeholders on what would make this concession more attractive to potential investors in order to prepare an appeal for an extension on the duration and scope of the Head Concession Agreement, to be submitted to MET.

Infrastructure

The overall age of the infrastructure at Gobabeb necessitates continued attention and preventative maintenance. It remains problematical to allocate or raise sufficient funds for upgrading the living quarters of staff and interns and refurbishment of centre infrastructure. There is some respite regarding the former, however, as this will be addressed in the infrastructural development plans for NamParks V. Due to the bleak financial climate and limited success to raise funds for ongoing infrastructure issues during the previous year, the primary focus was on critical maintenance and improving preventative maintenance to ensure a functional and safe environment for staff and visitors.

As previously reported, the installed 48 kWp PV solar power generation infrastructure

at Gobabeb was insufficient to recharge the battery bank for night-time use. This then required frequent use of the 48 kVA diesel generator to recharge the batteries, resulting in ongoing fuel and maintenance expenses. A proposal for expanding solar PV power generation at Gobabeb was approved by the giz - BMCC II project. The tender was awarded to SolSquare and additional solar panels to generate 15.8 kWp were installed in June 2018. The solar panels were deliberately installed over the energy centre to improve passive cooling by reducing direct sunshine onto the roof.



After the new panels were installed, it emerged that ongoing power interruptions at Gobabeb were due to a faulty inverter. The inverter was removed and repaired, but the problems continued. Following further investigation, it was revealed that the power spikes observed at Gobabeb for more than a year were not due to the use of unauthorised equipment, but faulty inverters. Because of their age, Gobabeb could not replace single inverters, but had to replace all six inverters ensuring 3-phase AC power. Unfortunately, some of the waste management and water supply pumps at Gobabeb were also damaged due to the energy spikes caused by the inverters, which required additional unanticipated maintenance expenses as two water supply and three liquid waste pumps had to be repaired or replaced. These expenses

were co-funded through the MET contribution and Gobabeb's own operational maintenance budget.

Outstanding maintenance issues carried over from previous years such as replacing petrol tanks, repairing the swimming pool, resealing the water tower, and resolving non-critical electrical faults could not be addressed due to inadequate funds. The second Trickle Filter was commissioned during the year

despite ongoing operational issues with poorly planned sewerage sumps and pipelines. Resolving issues relating to liquid waste flows to fully exploit Trickle Filter 2 shall unfortunately require large-scale replanning and reinstallation of liquid waste infrastructure to avoid depressions that leads to blockages.

Plans for the Future

The following outline the key elements within the organisational plans for 2020/2021 and onwards:

Research

- Develop new partnerships to expand Gobabeb's research network and secure science funding from additional, novel sources;
- Explore joint initiatives with UNAM, NUST and other tertiary training institutions in southern Africa for science education and research;
- Encourage and monitor scientific and societal impacts of research endeavour, i.e. through numbers of scientific publications, public presentations and multimedia tools;
- Improve functionality of laboratories and acquire field research equipment;
- Develop research priorities and budgets, under the ambit of the strategic plan.

Training

- Continue to implement the capacity building sustainability strategy through, for example, increased involvement of alumni in training programmes;
- Continue to integrate research and training functions to optimise human resources;
- Maintain and expand the customer base for existing training interventions; while developing and promoting innovative tertiary level offerings;
- Secure multi-year resource streams to sustain flagship training offerings, e.g. SDP, GTRIP, YES, and annual training to benefit the local primary school in Utuseb;
- Explore new opportunities to develop and implement MOOC (Massive Open Online Courses) training interventions;

- Develop information material and implement targeted activities to promote and market the Namib Desert;
- Expand and populate Gobabeb's website to adequately reflect and promote our core business;
- Promote opportunities and develop relationships with local and regional universities to facilitate postgraduate studies for Namibian students.

Organisational development

- Support the process of finalising the legal and operational frameworks for Gobabeb;
- Explore priority activities to secure adequate and diversified funding to implement Gobabeb's five-year Strategic Plan relating to its core business;
- Continue to improve the financial management system and refine management information reporting systems;
- Continue efforts to formally operationalise Gobabeb's Tourism Concession;

- Improve customer service and ecotourism experience to increase bed occupancy;

Infrastructure

- Develop a site master plan for future expansion, with specific reference to staff accommodation and office facilities;
- Develop priorities for the maintenance and upgrading of Gobabeb's infrastructure, with reference to long-term maintenance records and planning;
- Further upgrade the solar energy system, efficient energy use and cost recovery measures;
- Upgrade water management system and evaluate use and cost recovery measures;
- Renovate and refurbish swimming pool and recreation area;
- Upgrade ICT system and options to improve access to and functionality of internet facilities;
- Inventory ICT hardware and software towards an equipment replacement plan.

Staff (as of 01 March 2020)

Staff on the Establishment

Executive Director	Dr Gillian Maggs-Kölling
Office Manager	Ms Elna Irish (part-time)
Accountant	Ms Ileni Hiwilepo (part-time, off-site)
Research Manager	Dr Eugene Marais
Senior Researcher	Ms Angela Curtis (until March 2019)
	Mr Titus Shuuya (until July 2019, off-site)
	Ms Elbe Becker (off-site) ¹
Junior Researcher	Ms Saima Shikesho ²
	Mr Martin Handjaba ³
	Ms Jessica Roberts ⁴ (part-time)
Training Coordinator	Ms Kapandu Shihepo (from 01 Jan 2020)
Site Management	Vacant
Receptionist/Hospitality	Ms Leena Kapulwa
Cleaner	Ms Linda Bees
	Ms Selma Swartbooi
	Ms Rita Swartbooi
Technical Team	Mr Josef Gariseb
	Mr Samuel Gowaseb
	Mr Richardt Swartbooi
	Mr Jeffrey Khurisab

¹ PhD Natural Resource Science, NUST (completion 2021), *Evaluation of human-induced water stress in riparian trees in the central Namib Desert.*

² MSc Biological Sciences, University of Cape Town (completion December 2020), *!Nara (Acanthosicyos horridus) seed dispersal by black-backed jackals (Canis mesomelas) and gerbils (Gerbillurus spp.) in the central Namib Desert.*

³ MSc Environmental Sciences, North-West University (completion December 2021), *The influence of thermal conditions on the surface activity of two endemic gerbil taxa in the Namib Desert.*

⁴ MSc Zoology, University of Pretoria (completion December 2020), *Thermoregulatory behaviour and microhabitat use by Dune Larks in the Namib Sand Sea.*

Post-graduate student associates, on-site

Mr Ndelimona lipinge, MSc candidate, UCT (January 2020 – December 2021), *Habitat use and resource partitioning by the Namib Golden Mole (Eremitalpa granti namibensis Bauer & Niethammer, 1959).*

Ms Ailly Nambwandja, MNRM, NUST, (June 2019 – July 2021), *The use of multispectral UAV imagery for monitoring lichen responses to fog and disturbances, Central Namib.*

Mr Natanael Ndilenga, MSc candidate (January 2020 – December 2021), *Pollination biology and demography of Welwitschia mirabilis in the Namib Desert, Namibia.*

Ms Leandri Wessels, MSc candidate, NWU (February 2020 – December 2021), *Thermotopographical influences on biological soil crust composition along a fog gradient in the central Namib Desert.*

GTRIP interns 2019 (March – June)

- Mr Ruben Angala, NUST-WIL, *A study of human-wildlife conflict within the Topnaar community living along the Lower Kuiseb River in the Namib-Naukluft Park, Namib Desert.*
- Ms Ailly Nambwandja, UNAM, *Daily lichen activity response to fog events using drones: A fine scale observation in the central Namib Desert.*
- Mr Natanael Ndilenga, UNAM, *Pollination ecology of Welwitschia mirabilis in the central Namib Desert, Namibia.*

GTRIP interns 2020 (January – February)

- Ms Noita Josob, NUST-WIL, *An analysis of household use of forest resources in the Lower Kuiseb, Namib-Naukluft Park.*

Short-term Interns (up to February 2020)

- Mr Petrus Amadhila, Site Management/Research Intern, July 2019 – February 2020, Namibia
- Mr Gregory Golando, Training/Outreach Intern, January – November 2019, USA
- Mr Felix Gschwender, Research Intern/Student, April – June 2019, Germany
- Mr Michael Januschowsky, General Intern, August – October 2019, Germany
- Ms Julia Jones, Student, July – August 2019, UK
- Ms Mamamia Kaudimomanhu, UNAM Field Attachment, December 2019 – January 2020, Namibia
- Mr Max Kohl, General Intern, August – September 2019, Germany
- Mr Tristan Kölling, Tourism Intern, March – June 2019, Namibia
- Ms Gail Makoni, UNAM Field Attachment, December 2019 – January 2020, Namibia
- Ms Gina Naruses, UNAM Field Attachment, December 2019 – January 2020, Namibia
- Mr Alex Pohl, General Intern, August – October 2019, Germany
- Ms Ndepandula Shihepo, May – December 2019, Namibia
- Mr Luke Symonds-Mayes, Research Intern, August 2019, Namibia

On-site caterer (Outsourced Service Provider)

- Mr Hendrik Adams

NERMU PI / Research Associate

- Prof. Theo Wassenaar, NUST – PI, NERMU (Namib Ecological and Restoration Monitoring Unit)

NERMU post-graduate student associates, off-site

- Ms Paulina Fendinat, PhD in Natural Resource Science, NUST (registered December 2019). *The ecohydrology and physiological response of the Namibian desert plant Welwitschia mirabilis within the context of land-use changes and climate change.*
- Mr Jonas Lipopela, MNRM, NUST (registration 2019, completion December 2020). *Using ecological niche modelling to evaluate environmental and anthropogenic threats to the Husab sand lizard (Pedioplanis husabensis) in the central Namib Desert.*
- Mr Hallelujah Shaanika, MNRM, NUST (registration 2018, completion June 2020). *Assessing the likelihood that burrowing gerbils in the central Namib are ecological engineers.*

Part-time NERMU field assistants

- Ms Doris Kinyaga
- Mr Leonard Mandume
- Mr Roland Mushi
- Mr Wilbard Mutewa
- Ms Elizabeth Shilunga

External Post-graduate students associated with Gobabeb

Mr Francois Becker, PhD, University of Witwatersrand, RSA (registration 2018). *A taxonomic and phylogenetic revision of the genus Ptenopus (Reptilia: Gekkonidae)*.

Mr Robert Logan, PhD, Michigan State University, USA (completion 2021). *Photo-degradation in the Central Namib.*



Financial Overview

The 2019/20 audit report raises a concern as to the ongoing decline in sources of income and lack of diversification in income streams for Gobabeb, which may affect the long-term viability of operations. This concern echoes that of the management team at Gobabeb, who are very aware and equally troubled by the situation. Since Gobabeb operates under a specific mandate and the terms and conditions of a collaboration agreement, there are limited remedial measures to improve the situation beyond strict fiscal measures and attempting to secure more funding for projects – both of which have already been instituted

The total income declined by a further 17.6% from the previous year, while expenditure decreased by 12.2%. However, the effective expenditure decrease was 24.96% in response to the anticipated fiscal situation; about 26% of the total expenditure was due to financial review and reconciliation of debts.

Gobabeb's main source of income is based on its knowledge assets, essentially its staff. As income from projects and research affiliations continues to decline, the relative importance of income derived from hosting researchers, training events, visitors and workshops becomes more critical. Staff knowledgeable on a broad range of disciplines relevant to the Namib Desert, who can advise and support external research interests, are fundamental to sustaining this source of income; and are currently our most valuable asset.

Most of the income during 2019/20 was from the provision of accommodation, meals, and technical support, contributing more than 52% of total income. This includes the use of Gobabeb facilities and expertise by four international film crews producing natural history documentaries in the Namib.

Income was also derived from eleven on-going projects and signed service agreements,

of which three were new. The two largest projects in terms of income during the present financial year are:

- NERMU – Swakop Uranium Biodiversity Programme
- Benefit Sharing in the Namib Sand Sea – FLC, Embassy of Finland

The second largest income source for Gobabeb is generated through bespoke and *ad hoc* training programmes. Such training projects contributed *ca.* 18.6% of income through funding secured for signature education and capacity development projects. The primary capacity building projects are:

- Youth Environmental Summit (YES) – giz and MET
- Gobabeb Training and Research Internship Programme (GTRIP) – Langer Heinrich Uranium, co-funded by London Zoological Society
- Diverse post-graduate student support initiatives
- Biophysical Field Methods (BPFM) – Diverse sources

MET contributed N\$ 150,000 towards the annual expenditure of both capital investment and maintenance of infrastructure, which was a slight but welcome increase from previous years. The major commitment was towards replacing the inverters in the energy room and sundry improvements to both solid and liquid waste management at the centre, including repairs and replacement of facility installations.

The overall financial situation of Gobabeb remains extremely challenging as austerity measures continue and only a few opportunities to propose or to initiate new research and capacity development initiatives occurred during the year.

The Annual Report for the Gobabeb Trust, set out on the preceding pages, was approved by the Trustees on 2020 and is signed on their behalf as below.

Report of the Trustees signed by:

Mr Teofilus Nghitila
Chair



List of Abbreviations and Acronyms

AWS	Automatic Weather Station
BMCC II	Biodiversity Management and Climate Change II Project
BPFM	Biophysical Field Methods
CEO	Chief Executive Officer
CMEG	Centre for Microbial Ecology and Genomics
CNRS	French National Centre for Research
DRFN	Desert Research Foundation of Namibia
EBD	Ecosystems and Biodiversity
FLC	Fund for Local Cooperation of the Finnish Embassy
FOWS	First Order Weather Station
giz	Deutsche Gesellschaft für Internationale Zusammenarbeit
GTRIP	Gobabeb Training and Research Internship Programme
HWC	Human-Wildlife Conflict
IAEA	International Atomic Energy Agency
ICT	Information and Communications Technology
JOGMEC	Japan Oil, Gas and Metals National Corporation
JVA	Joint Venture Agreement
KIT	Karlsruhe Institute of Technology, Germany
MET	Ministry of Environment and Tourism
MOOC	Massive Open Online Courses
MPI	Max Planck Institute, Germany
NaFoLiCA	Namib Fog Life Cycle Analysis
NamParks	Namibia National Parks Programme

NCRST	National Commission on Research Science and Technology
NERMU	Namib Ecological Restoration and Monitoring Unit
NNP	Namib-Naukluft Park
NPL	National Physics Laboratory, UK
NSS	Namib Sand Sea
NUST	Namibia University of Science and Technology
NWU	North-West University, South Africa
RSA	Republic of South Africa
SASSCAL	Southern African Science Service Centre for Climate Change and Adaptive Land Management
SU	Swakop Uranium
TROPOS	Leibniz Institute for Tropospheric Research, Germany
UCT	University of Cape Town, South Africa
UK	United Kingdom
UNAM	University of Namibia
UNDP	United Nations Development Program
UNISA	University of South Africa
UP	University of Pretoria, South Africa
US	University of Stellenbosch, South Africa; United States [of America]
USA	United States of America
WIL	Work Integrated Learning
WMO	World Meteorology Organization
YES	Youth Environmental Summit

Legal and Administrative Information

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