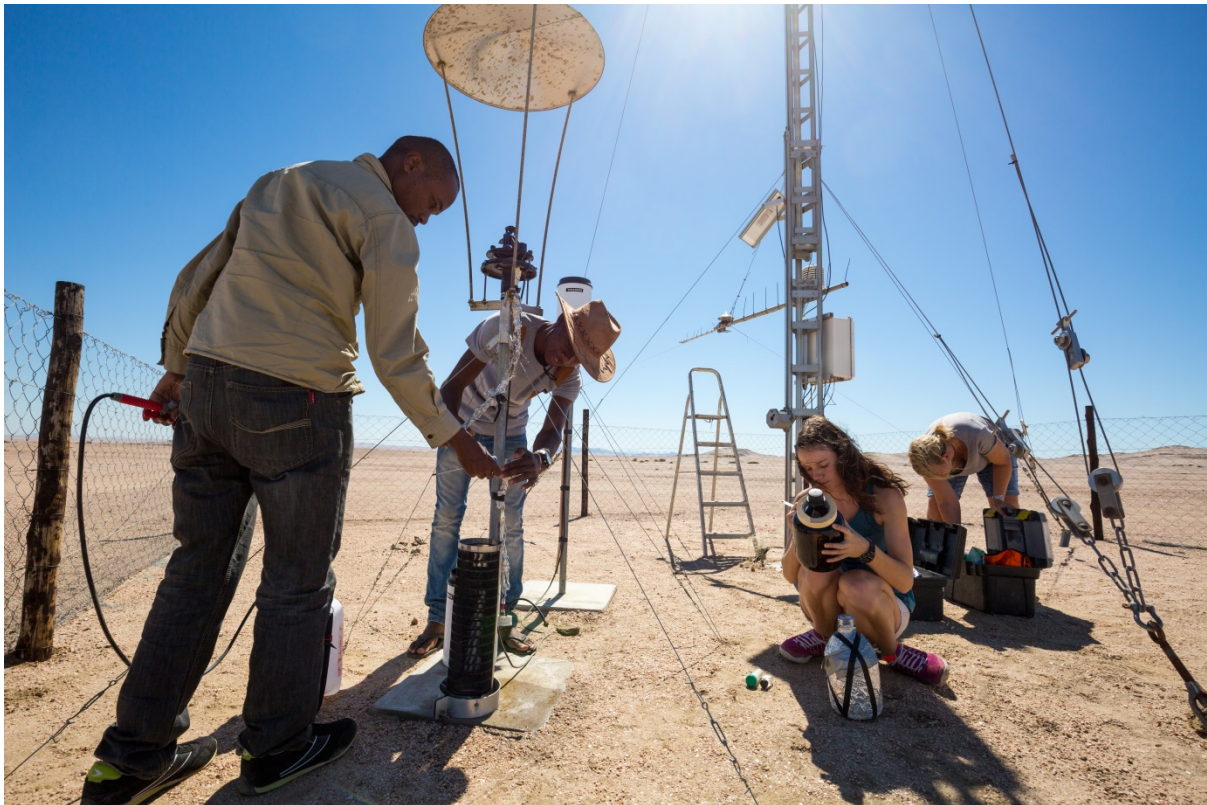




Annual Report

For the Year ended 28 February 2018



THE GOBABEB TRUST

Trust Registration Number T53/98 (Namibia)



Message from the Chair of the Board of Trustees

It is once more my honour to report on behalf of the Board of Trustees, as to progress at the Centre during the 2017/2018 financial year.

A twenty-year arrangement that allowed for the operationalisation of the Gobabeb Trust is rapidly drawing to a close. The Joint Venture Agreement (JVA) was established in 1998 between the Trust, the Ministry of Environment and Tourism (MET) and the Desert Research Foundation of Namibia (DRFN). The Board of Trustees, over the past two decades, has chartered the course for Gobabeb through calm seas as well as choppy waters. With landfall ahead at the end of this particular journey, this final leg should allow for, and I personally encourage, some reflection on the achievements and challenges, as well as strategic projection and planning to ensure the long-term sustainability of the Centre.

With a long history in research and development, Gobabeb has established many technical networks that support its traditional focus areas of Namib Desert ecology and long-term monitoring. The rate that these partnerships are expanding and diversifying is an exciting trend, and holds huge promise for the future. Without a doubt, Gobabeb may be regarded as the premier research institute in the Namib. The impact of this research, as traditionally measured in bibliometric terms, shows a significant and sustained upswing in output during the past five years. Some 49 peer-reviewed research papers and theses were produced in 2017. Current applied research projects will also have a distinct socio-economic impact, most notably investigations into livestock behavioural adaptation to temperature extremes; and post-mining land rehabilitation. However, to remain relevant whilst capitalising on its signature strengths, Gobabeb must enhance its role as catalyst and coordinator in the broader research sector in Namibia. While maintaining its reputation as an environmental research centre, Gobabeb can take the lead, and is already a significant

player, in addressing strategic issues such as climate change. In global arenas, Gobabeb is already regarded as a centre of excellence and a protagonist in science diplomacy.

Education, as an integral element of the research cycle, is another area in which Gobabeb continues to excel. Calls to participate in Gobabeb's flagship training programmes attract hundreds of applications. Fulfilling a tertiary training need is definitely where Gobabeb can have most impact at national level. Success from capacity building intervention at the individual level depends partly on being able to embed science graduates in a high-quality research experience with long-term goals and opportunities, like at Gobabeb. Just in this past year, 19 postgraduate degree studies were in progress or completed at Gobabeb, 10 by staff or alumni. Gobabeb remains engaged in discussions with Namibian universities and international partners to scale-up and develop new training programmes for our emerging scientists.

In appreciating the achievements over the past year, as reported by the Executive Director, it is even more impressive when considering the limitations of the small staff complement on site. In order to remain responsive to an ever-changing context and to specifically address emerging issues associated with global change and arid lands, with a broader reach for national benefit, it is urged that Gobabeb should not neglect to review its current and consider its future needs for internal organisational structures, procedures and capacities. Improved capacity to finance, plan, manage, implement and monitor research in the immediate and longer term would be key to sustain the Centre. However, underpinning all this effort would be to secure committed funding for infrastructure development and operations, and to devise and implement innovative funding streams to support research, without detracting from Gobabeb's core business.

The economy continued its downward spiral in 2017. Gobabeb, despite the institution of austerity measures, will face serious challenges in the near future to continue executing responsive, innovative research, capacity development and outreach. At the same time, Centre management has to contend with an aging and deteriorating infrastructure, coupled with the pressure to expand facilities to adequately accommodate staff and science visitors. With no indication of an economic turnaround, the Board has an important role to continue to steer the Centre through the difficult times ahead. In this regard, we are grateful for the current support of development partners, corporate sponsors, grant awarding bodies and other

fundors for their financial contributions and advocacy in support of Gobabeb's vision and mission.

The review of the JVA, and the potential repositioning of Gobabeb, offers an exceptional opportunity to assess our position, and map the way forward to new territory. It is clear that it will have to be "all hands on deck" in navigating the next epic adventure. We should not be afraid of the storm ahead, as we have learnt over decades how to sail the ship.

Dr Malan Lindeque
Chairman

Report of the Executive Director

Despite always remaining forward-looking and striving to deliver of our best within our means, we cannot deny that this past year has been a particularly challenging one for Gobabeb.

We were saddened by the passing of our patron, Mr Eckart Pfeifer, after a long illness, on 24th May 2017. Eckart was closely associated with Gobabeb for more than 40 years, during which time he provided vision and strategic advice at governance level, and stalwart support to former director, Dr Mary Seely. His generous investment over the decades is still very much evident and will endure for years to come.

Like most other enterprises in Namibia, we have had to take a hard look at our bottom line – and tighten our belt! Austerity measures already in place have had to be tweaked; every effort had to be made to ensure that limited resources were maximised; and that economy countered effectiveness in everyday operations.

Within this incapacitating financial context, the achievements reported here are largely due to the grit and dedication of a small team, supported by locally and internationally

sourced interns, volunteers and students. Our staff consistently subscribe to the Gobabeb ethos of excellence in science and education. They do this while keeping an eye out for opportunities, and managing challenges that impact on the execution of tasks within our focal areas of research and training. As always, these human gems come and go, and often return. In this regard, the staff complement was strengthened through the appointment of an experienced, knowledgeable senior scientist as on-site Research Manager; several Master of Science graduates were appointed; interns were retained or recalled to assist with discrete science tasks; an off-site Namib Ecological and Restoration Monitoring Unit (NEMU) staff complement is growing to provide a science service to the mining sector; and we reappointed a previous office manager into an unplanned vacancy to ensure continuity. Several staff left at the end of 2017 to pursue further studies or to take up positions in the teaching profession and health sector or to explore entrepreneurial opportunities. We are assured that they take away a Gobabeb experience that has offered both personal and professional growth, as well as a deep appreciation of the Namib Desert.

The long-standing partnership between Gobabeb and Grinnell College in Iowa, USA, came to a close in April 2017. After 16 years of support during which young Fellows were placed at Gobabeb to assist with routine operations, the College management decided to discontinue this programme. Many previous ex-Fellows return as postgraduate students and/or visitors, or remain in contact with us, which attest to the fact that their tenure at Gobabeb was a positive and potentially life-changing experience for them. Gobabeb acknowledges the significant collective contribution by this College, as well as the inputs of individual Fellows, who will always be remembered fondly and with the highest professional regard.

And as this door closes, others open Gobabeb obtained “sister reserve” status after signing an agreement with the University of California Natural Reserve System, which will foster cooperative research into climate change and the ecosystems of arid lands in California and southern Africa. Formal service agreements are being developed for new projects with the Leibniz Institute for Tropospheric Research (TROPOS) in Germany and the National Physics Laboratory (NPL) in the UK; while existing arrangements are under review for renewal and project extension (e.g. University of Iowa, USA; Max Planck Institute (MPI), Germany; Karlsruhe Institute of Technology (KIT), Germany). We are particularly proud of the formalised arrangement that we now enjoy with the Namibian Scientific Society; and are exploring establishing such ties with a similar body at the coast. Although these legal instruments may be a measure of enhanced science cooperation, many other new partnerships are being more loosely conceptualised and several other longstanding collaborations continue to develop according to evolving needs and aspirations.

The growing number of research products from work done at Gobabeb, and an increase in the number of student projects planned and executed, are a pleasing indication that Gobabeb continues to answer the call for sustainable science-based solutions for

application in the environmental, mining and natural resource management sectors. Although science funding has drastically declined throughout the world, and access to these limited funds becoming increasingly competitive, the number of foreign researchers visiting Gobabeb annually remains relatively stable. Six fact-finding visits were conducted by US and European institutions to explore partnership potential with Gobabeb, and three proposals for funding to realise opportunities have been submitted as a result. An encouraging trend is a steady increase in Namibian researchers and Namibian students carrying out work at Gobabeb. The signing of a Master Agreement with the National Commission on Research Science and Technology (NCRST) triggered a trickle of capacity building funds to support Namibian postgraduate students to undertake geospatial monitoring of livestock behavioural responses to temperature extremes and desert conditions, specifically to develop information relevant to global change adaptation. Six postgraduate studies are currently being conducted at the station. NERMU continued a number of restoration and monitoring activities, notably in consultation with Skorpion Zinc (Sperrgebiet), Swakop Uranium (Husab) and Langer Heinrich Uranium mines. A closer collaboration with the Namibia University of Science and Technology (NUST) in restoration ecology is being planned, which will further support the capacity building element associated with this work.

In order to fully optimise this research growth potential, the facilities to accommodate additional staff and students on site will need to be urgently expanded. Pledged donor support in this regard has been delayed, and other options for staff housing are being investigated. A Windhoek-based architect visited the station and is conceptualising a design for housing units. Compounding this situation is the maintenance, upgrade and improvement of Gobabeb’s aging infrastructure. The failure of the Gobabeb underground fuel storage has not been resolved, and discussion with a fuel supplier is ongoing. The declining energy storage

capacity at the station was the most pressing concern, with power supply reliant more and more on the diesel generator. The Deutsche Gesellschaft für Internationale Zusammenarbeit (giz), through the Biodiversity Management and Climate Change project, agreed to support the replacement and expansion of the battery bank at Gobabeb, and a tender for the supply and installation was subsequently awarded. This generous donation will meet current needs, while also making provision for future expansion. Gobabeb's routine monitoring tasks in the dunes will be facilitated through the donation of a valuable addition to our fleet, a 4x4 ATV, donated by the Turkish Cooperation and Coordination Agency (TIKA).

Training programmes at Gobabeb remain popular, and we received 15 schools and 8 tertiary training groups on site. Specific offerings targeted nearby primary schools (Namib Sand Sea [NSS] outreach), senior secondary schools countrywide (Youth Environmental Summit [YES]), exposing university students to research methodologies (Gobabeb Training and Research Internship Programme [GTRIP]) and training international postgraduates how to investigate specific questions (Biophysical Field Methods [BPFM]). Training continued regarding benefit-sharing opportunities for local communities associated with the Namib Sand Sea World Heritage Site. This Fund of Local Cooperation (FLC)-funded programme, started in 2016, was expanded to benefit other NSS stakeholders, including MET and Namibia Wildlife Resorts (NWR). Lectures based on previous and current research were presented at various fora by staff and science partners. The Namibia Scientific Society organised a weekend excursion to Gobabeb for their members in October 2017. A new promotional video was developed, as well as an information brochure, which both showcase Gobabeb as a premier research facility. Gobabeb therefore continues to emphasise the interrelatedness of research, training and outreach for effective sustainable development.

Rather than regarding, with trepidation, the impending expiry of the current JVA that operationalises the Gobabeb Trust, our slant was that it actually offers a good opportunity to review to what extent this arrangement has provided a conducive framework for the operations of the Centre. It was also judicious to assess other options now available some twenty years later, which may offer more appropriate non-profit group models and greater benefit to Gobabeb. Options that draw on the strengths of the current arrangement, as well as those that take advantage of other potential partnerships and opportunities needed to be identified, circumscribed, and presented to the Board for consideration. The Namibian Chamber of Environment (NCE) was regarded as an entity with the experience, background understanding and visionary approach to undertake this review. During the latter part of 2017 and early 2018, Gobabeb management worked closely with the NCE to gather information through consultation; and develop scenarios that would support continued growth of the Centre, as well as ensure its long-term sustainability as an independent, top-ranked research organisation in Africa. It is anticipated that the Board will take a decision on the way forward early in the new Financial Year.

These are challenging but exciting times for Gobabeb. Like other successful communities in the Namib Desert that are typically hardy, dynamic, and truly adapted to flourish in the most trying of circumstances, Gobabeb is preconditioned to be able to overcome the current limitations. The current institutional review has allowed for reflection and horizon-scanning in evolving an even more resilient institution. At the same time, if we are able to harness the good ideas, good partnerships and abounding goodwill, the future looks very bright indeed.

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 28 February 2018.

Organisation and Governance arrangements

Gobabeb is a registered Trust and currently operates as a Joint Venture between the Ministry of Environment and Tourism (MET) and the Desert Research Foundation of Namibia (DRFN). With the termination of the 20-year Joint Venture Agreement on 27 May 2018, the future legal and operational frameworks for Gobabeb are under revision. It is anticipated that the Gobabeb Trust will be retained, with amendments to the Deed of Trust, and a new cooperation agreement established with the MET for access to the station facilities in the Namib-Naukluft Park.

The Board of Trustees is responsible for setting out the strategic direction of the institution 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.

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.

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.

Gobabeb Governance

The Board of Trustees consists of eight members, three representing MET, three from the DRFN, one representing the tertiary training institutions; and one representing the local community.

The Trustees who served on the Board during the financial year are shown (in the positions they held at year end) and are as follows:

Dr M. Lindeque(Chair)
 Dr A. Matros-Goreses(Vice-Chair)
 Chief S. Kooitjie
 Mr T. Nghitila
 Dr M. Seely
 Dr T. Tjivikua
 Mr C. Sikopo
 Dr M.Schneider

The Board met three times (43rd Business meeting on 12 July 2017; 12th Annual General Meeting and an Extraordinary Board Meeting, both held on 03rd November 2017) during the year under review. Meetings were regularly scheduled and cancelled due to unavailability of Board Members as a result of strenuous work programmes.

Management

The Executive Director at the end of February 2018 was Dr Gillian Maggs-Kölling. The Executive Director is responsible for the day-to-day management of the Centre'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 Coordinator (Dr Theo Wassenaar); the Research Manager (Dr Eugene Marais) and the Office Manager (Ms Laetitia Lombard; Mrs Elna Irish). 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 2017/2018

Strategic

A draft five-year Strategic Plan (2017–2021) developed during the previous financial year was not formally endorsed by the Board, given the pending repositioning of Gobabeb, and the potential for a new visioning process by management supported by the new governance structure at that juncture. The draft plan however still served as framework for annual operational planning and budgeting for Financial Year 2018/2019 based on eight strategic objectives in the following four key areas:

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

In order to better inform the repositioning process, the MET requested for a review to be undertaken. The Namibian Chamber of Environment (NCE) was approached to undertake an evaluation of the current status quo; to propose scenarios for the future legal and operational framework for Gobabeb; and to facilitate a meeting involving Board members and Gobabeb Management to agree on an appropriate and forward-looking arrangement. This activity was initiated in August 2017, and recommendations finalised for submission to the Board in February 2018.

Research

The core purpose of Gobabeb for the past 55 years has been to pursue, support and facilitate science. It requires the right balance between short-term and longer term research goals and initiatives. Continuity and consistent results are based on forward planning and judicious scheduling and application of resources, i.e. trained staff, functional equipment, sufficient data, experimental design. The flexibility and ingenuity to exploit or cope with transient or rapidly developing

scenarios is, however, as important for a vibrant and responsive research culture.

The foundation for doing science is motivated and well-informed people. Eight students associated with Gobabeb completed studies during 2017, of which three were Namibian (Ms Ruusa Gottlieb [UCT]; Ms Novald Iiyambo [UP]; Ms Esther Uushona [US]; all MSc), one South African (Ms Monja Gerber [NWU] MSc), two German (Sebastian Kirchhof PhD [HUB]; Mr Leufen [KIT] BSc) and two from the USA (Ms Bonan Li [IUPUI] MSc; Ms Bryn Morgan [Dartmouth College] BS Honours). Two staff members are registered as Masters degree students, Ms Angela Curtis (UNISA) and Mr Eric Shiningayamwe (UNAM). Angela is investigating the response of bats in the Namib to various wavelengths of light, while Eric started evaluating how cattle utilise the lower Kuiseb environment, after completing the coursework component towards a Masters degree in Rangeland Management.

Recurrent duties at Gobabeb include maintaining research equipment, collecting data and providing technical support to international partner institutions. Participating in global initiatives and providing research support are important components in maintaining a network of international partners and ensuring channels for knowledge transfer and experience. Gobabeb staff participated in several international research projects, notably the Biodesert initiative coordinated through the Rey Juan Carlos University (Spain); the AEROCLO-SA initiative coordinated by Laboratoire Interuniversitaire des Systèmes Atmosphériques; and the African Soil Microbial Ecology survey coordinated by the University of Pretoria. A six-month deployment of a Lidar instrument by Oxford University at Gobabeb is expected to improve information on wind dynamics.

Two major new partner projects were initiated at Gobabeb. A new tower installation

with multiple instrumentation packages will be used by the National Physics Laboratory (UK) and their partners to validate radiometric measurements by the Sentinel 2 satellite on behalf of the European Space Agency. The NaFoLiCA project (*Namib Fog Life Cycle Analysis*) by a consortium from the Ruhr University Bochum, Basel University and KIT, funded through the German Research Foundation, installed Sodar instruments at Gobabeb and on the coast to get improved wind profile data, while also installing additional instrumentation for improved monitoring and profiling of fog incidence at the FogNet station network.

In other joint projects, Gobabeb assumed official ownership of the FogNet weather station network in September 2017. A no-cost extension to April 2018 will allow for completion and closure of the project. Regular monthly surveys on the degree and impact of herbivory on !nara were initiated after completion of the exclosure plots. The results were evaluated, together with Dartmouth College, during November 2017 and revised protocols were initiated. The GPS tracking collars used to monitor livestock started to fail during 2017 and were removed, but could not be refurbished due to lack of funds.

Early in the year, Gobabeb was informed that its proposal for research capacity building to the NCRST was successful. Unfortunately, even though a contract for implementation was signed, the NCRST received insufficient funding and implementation was deferred. The project intends to train around seven Masters and PhD students and 12 Honours students to use integrated geospatial, environmental, physiological, behavioural and ecological information to investigate the utilisation of Namibian rangelands by livestock under variable climatic conditions. The unavailability of funds was a considerable setback. Gobabeb was, however, more successful with a number of other proposals to acquire replacement or modern research equipment.

Gobabeb received a donation of a new multi-seater 4x4 ATV to support students and long-

term monitoring around Gobabeb from TIKA. This welcome addition had an immediate effect by reducing maintenance and operational costs of the aging single-seater ATVs. After a successful proposal to the Go Green Fund, Gobabeb received two modern SM4 bat detectors to monitor bat activity. Another competitive proposal for a Parrot Disco Pro drone to monitor the photosynthetic response of lichens to fog events in the central Namib was also successful, but unfortunately the hardware was incomplete and the N\$60,000 drone could not yet be deployed for research.

During the year, Gobabeb prepared and submitted twelve proposals for research funding to various agencies and foundations. Six of these were fairly minor, such as the proposals that resulted in receipt of a drone and new GPS collars to continue the project on livestock movement along the lower Kuiseb. Two new research initiatives to monitor and investigate acoustic communication of the three species of *Ptenopus* barking geckos in the Namib, and using water potential and leaf area indices of trees along ephemeral rivers as a proxy of environmental health and anthropogenic stress, started during the second part of the year.

NERMU continued with its programme of delivering biodiversity research and monitoring services at Swakop Uranium's Husab Mine in the Central Namib. Implementation of a monitoring programme, approved by the company, was rolled out, with one component focusing on tree health in the Swakop and Khan Rivers, another on the physiological health of desert shrubs and a third on *Welwitschia*. Additional research projects on the Husab Sand Lizard, the ecological engineering role of gerbils and the ecohydrology of *Welwitschia* and riparian trees were developed and submitted for funding to Swakop Uranium as PhD and MSc opportunities, hosted by NERMU and with students registered at NUST under the Gobabeb-NUST Affiliation Agreement. In the southern Namib a trial rehabilitation project developed for Namdeb's Sendelingsdrif Mine

was implemented and work commenced to develop a restoration plan for Skorpion Zinc.

The legal mandate for issuing research permits lies with the NCRST and was enacted during 2017. Both local and international scientists were concerned that new procedures for the issuing of permits may potentially be a barrier to science. In its role as a research facilitator, Gobabeb consulted extensively with the NCRST in order to advise its partners and collaborators on procedural issues. Gobabeb received its registration as a Namibian-based Research Institution during 2018. Also, in its role as a facilitator, and in the absence of interest from other national competent institutions, Gobabeb undertook to facilitate the 9th International Congress of Dipterology (ICD9) that will be held during November 2019 in Windhoek. Discussions with likely organisers of several other international conferences over the next three years may result in Gobabeb hosting excursions in various scientific disciplines.

Training

Four students participated in the six-month internship programme, GTRIP, supported under a five-year commitment from Langer Heinrich Uranium, and co-funded by the Zoological Society of London and Gobabeb. Interns and projects included:

- Ms Ester Kayala, UNAM: *Managing Radon at the Langer Heinrich Mine;*
- Ms Petra Mutota, NUST-WIL: *Comparison of micro-climate, edaphic properties and fauna at Acanthosicyos horridus hummocks and inter-hummocks in the lower Kuiseb River, Namibia;*
- Ms Saima Shikesho, UNAM: *The response of scorpions to thermal conditions in the Namib Desert;* and
- Ms Elizabeth Shilunga, UNAM: *The effect of non-rainfall moisture on the photosynthetic efficiency of Acanthosicyos horridus in the central Namib Desert.*

A second iteration of the postgraduate Biophysical Field Methods course was conducted. 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), National Museum of Namibia and Gobabeb. In 2017, 13 students from Namibia, Israel, the USA, Canada and South Africa 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.

Gobabeb prepared and submitted an outline for an envisaged SDP 21 during September 2017. Despite an intention to support five SDP projects related to management and monitoring of the Namib Sand Sea, the Environmental Investment Fund (EIF) was not able to support the final project in the cycle due to reduced availability of funding. It was also unable to reimburse Gobabeb for its investment in the previous SDP undertaken in 2016/17. Gobabeb therefore approached other potential donors with an alternative proposal on fuelwood burning and indoor air pollution that was tentatively approved. A Gobabeb staff member was trained on the use of specialist equipment in South Africa and participants for the 21st iteration of this flagship training on critical thinking and methodologies for environmental research were selected. Sadly, despite all efforts to secure funding for the initiative, which included adjusting dates for implementation, the SDP 21 programme were eventually cancelled as funding could not be secured.

Gobabeb's annual programme for Grade 11 learners, the Youth Environmental Summit (YES), was held 12th-21st May 2017, under the International Day for Biological Diversity theme "*Biodiversity and Sustainable Tourism*".

It was hosted at Gobabeb, and included 31 learners from the Erongo, //Kharas and Khomas Regions, as well as one YES alumnus, currently studying accounting at UNAM, who acted as a mentor and chaperone. Participants hailed from 15 different schools, and one home school. The FLC supported YES 2017, while co-funding was provided by MET and Gobabeb.

A further bespoke outreach and education initiative, entitled "*Knowledge of the Namib*", to promote appreciation and understanding of the Namib Sand Sea (NSS) as World Heritage, funded through the FLC, was undertaken during 2017. This travelling educational product on the Namib Desert's natural history and ecology reached 979 learners from 12 coastal schools in the Erongo Region.

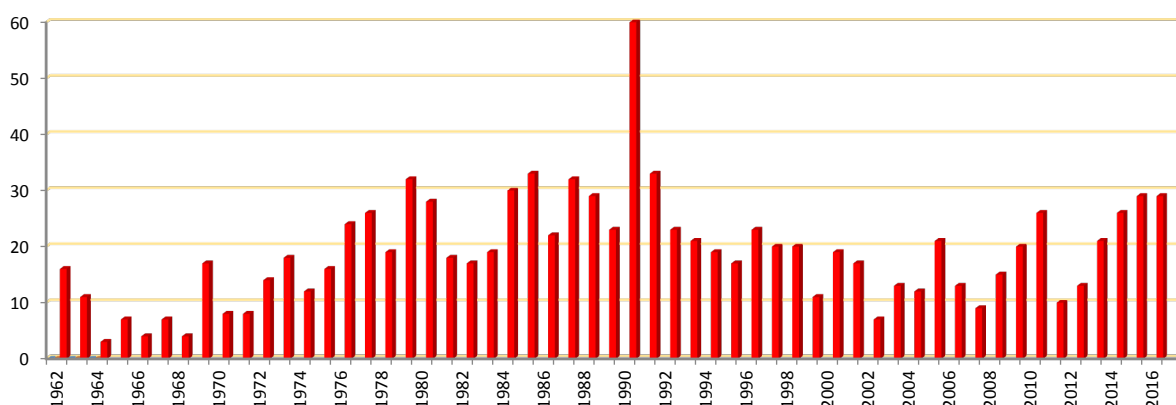
Training to support members of the local ǀAoni (Topnaar) community to share in the benefits associated with the inscription of the NSS as World Heritage continued. This initiative is supported by the FLC. The training and investment started in 2016 into a sewing circle to develop and market traditional household crafts, consisting of twelve women from the local community, continued. Beneficiaries were provided with equipment and supplies, product development and business training, and marketing and promotion of needlecraft products. Assistance was provided to deliver finished products to commercial outlets at the coast. A full toolbox of relevant skills was transferred through an

intensive training cycle over six months to ensure sustainability of this alternate income generating opportunity. In addition, the first of several planned two-week tourism training courses was held from 1st-11th June. A manual was developed, called *Guiding in the Namib*, and training was executed by Gobabeb staff and key stakeholders from the tourism industry. The nine participants were all from the Topnaar community, eight male and one female.

Following consultation with the traditional authority, training of ǀAoni (Topnaar) community members in both needlecraft and guiding was suspended. Gobabeb was able to regroup and refocus some of the training activities to reach out to other beneficiary groups. Two groups of MET staff responsible for the NSS were trained on WHS management requirements in October 2017; while staff of NWR engaging directly with tourists received similar on-site training at Sesriem in December 2017.

Expanding and scaling-up this basic NSS natural sciences curriculum, senior scientists presented an advanced course to professional tour guides employed by a commercial tour operator in February 2018. This new training offering could be marketed to other tourism enterprises and provide an additional revenue stream to Gobabeb, while servicing a growing need for advanced science-based information in the eco-tourism industry.

Annual Scientific Publications from Gobabeb since its founding in 1962



Publications

The scientific publications produced by an institution is an internationally accepted metric of research efficacy. The positive trend in peer-reviewed publications emanating from Gobabeb continued. For only the sixth time since 1962, and the first time since 1991, more than 30 articles based on data collected or research conducted at Gobabeb by staff or research partners were published during the year. The 40 scientific articles and nine theses that appeared or were submitted during 2017 were only surpassed by the number of publications of 1990.

A premiere of a documentary film “*Surviving the Sand Sea*”, produced by the Gobabeb intern Oliver Halsey, was screened at the Namibia Scientific Society in Windhoek during December 2017. Two other, shorter documentary films to promote Gobabeb and its activities were also completed and distributed, while a number of popular science articles in periodicals and newspapers reported on Gobabeb’s work.

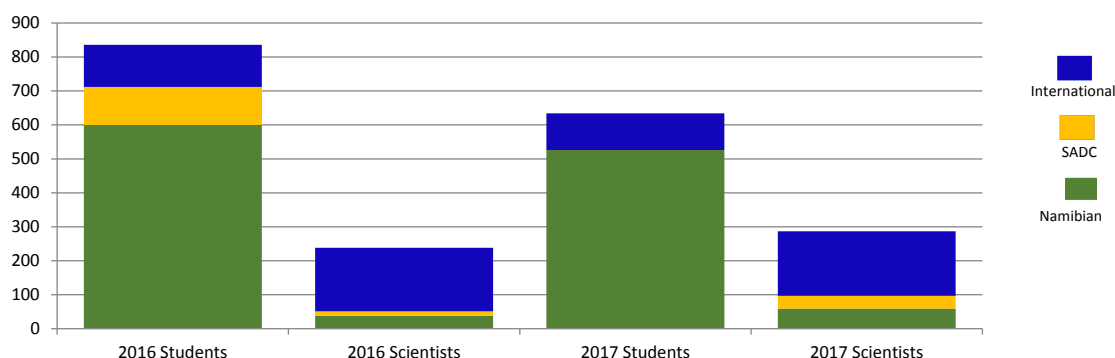
Furthermore, Gobabeb staff shared their results and knowledge through oral or poster presentations at a number of scientific or public meetings. These included several presentations to Namibian scientific societies, an EU-AU consultative workshop on climate change and renewable energy (Brussels); the South African Association of Botanists Congress (South Africa); an African bat research symposium (South Africa); a workshop on conservation of small animals (Windhoek); a science diplomacy workshop (Windhoek); and a WMO workshop on air quality monitoring (South Africa).

Visitors

Gobabeb hosted 1116 general visitors during the fiscal year at the centre, of which 566 were employees of Rössing Uranium, attending a series of team-building and information workshops about their medium-term strategic planning. The number of scientists visiting Gobabeb annually to carry out research, liaise with staff, or hold meetings remains fairly stable (260 scientific visitors), while 648 learners and students visited Gobabeb. Interns and staff at the centre conducted 502 tours about the environment and facilities at Gobabeb.

A concerted effort was made to market and attract suitable operators and entrepreneurs to activate the tourism concession as an additional means of support and income for Gobabeb. Altogether six potential investors were guided to sites and along potential routes to familiarise themselves with the area and what may be required to operationalise the concession in terms of their likely clientele. Other entrepreneurs were also provided with pertinent materials. No serious bids were offered. In some cases, operators advised that the boundaries of the concession area and the expectations should be adjusted to allow greater access and freedom of activities in highly sensitive areas. The duration of the Head Concession Agreement should be revisited and an appeal for an extension submitted to MET in order to make this concession more attractive to potential investors.

Number of Science Visitors to Gobabeb per Year



Infrastructure

The overall age and poor condition of the infrastructure at Gobabeb remained a concern during 2017/18. The petrol storage tanks, dating from the 1980s, were excavated and proved to have rusted through. Replacing the tanks with second-hand storage tanks will cost in excess of N\$ 80,000. That necessitated that Gobabeb has to undertake the expense of regular transport of fuel from the coast for its (limited) petrol driven vehicles. Various fuel companies were approached for a replacement, of which Total was the most sympathetic. Total issued an invitation to tender and hosted a meeting of likely contractors at Gobabeb to assess and propose the construction of a new filling station. Unfortunately it seems the amount of traffic, as well as internal consumption of fuel at Gobabeb, may not be enough for a cost-effective filling station.

The water leaks in Gobabeb's iconic tower are also a source of concern. Some cracks in the side of the tower were repaired during March and April. Not all the leaks could be sealed, especially not those in the floor of the reservoir. Repairs also had to be carefully scheduled to ensure that the station could remain fully functional to meet its obligations to visitors.

During the year, the condition of the batteries supporting the hybrid energy system continued to deteriorate. The 48 kVA diesel generator backup automatically starts up when the battery state of charge becomes too low, with start-ups and run periods becoming more frequent as the batteries started to fail and could not maintain sufficient charge. The extensive use of the generator resulted in considerable fuel and maintenance expenses. Fortunately, a proposal for replacement and even expansion of the battery storage system through the giz, with support from MET, was approved by the giz. Gobabeb prepared the

technical specifications for a 167 kWh battery storage system, which went out on tender during October 2017. After review, the tender was awarded to ConServ to install a replacement battery bank during 2018.

As the batteries continued to deteriorate during the year, Gobabeb had to progressively introduce energy saving measures during hours of darkness by initially requesting some equipment to be switched off, and later by cutting power late at night. Despite these measures, fuel and maintenance costs for the generator during the financial year were very high.

During the evaluation of appropriate technical specifications for battery replacement, it emerged that Gobabeb's solar PV generator has insufficient capacity to recharge even the previous 123 kWh battery bank. This is based on both deterioration of installed panels as well as new theoretical models and calculations derived from the instrumental arrays at Gobabeb measuring diurnal and seasonal fluxes of radiation and atmospheric particulate matter.

During October 2017, a pump at the Gobabeb swimming pool failed and all the water was lost. Since the pool has already developed small cracks, and was in urgent need of refurbishment, i.e. stripping of old paint, carbonate accretions and residues, it was allowed to dry out for refurbishment and repainting pending allocation of funds for maintenance.

During November 2017, a strong wind storm severely damaged one of the solar geysers, which was replaced through Gobabeb's insurance, while some of the roofs were damaged. Unfortunately sufficient funds for critical maintenance, urgent repair or refurbishment of failed infrastructure, and upgrading the living quarters of staff and interns remain problematical.

Plans for the Future

The following outline the key elements within the organisational plans for 2018/2019 and onwards:

Organisational development

- Support the process of finalising the legal and operational framework for Gobabeb's future operations;
- Explore priority activities to secure adequate 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;
- Develop a business plan for Gobabeb, including continued efforts to formally operationalise the Tourism Concession;
- Continue marketing activities for accommodation and improve customer service and ecotourism experience to increase bed occupancy;
- Continue to improve the communications plan, with specific reference to social media profile activity and website improvements.

Research

- Develop new partnerships to expand Gobabeb's research network and secure funding from additional 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;
- Evaluate condition and functionality of research equipment and undertake laboratory inventories;
- 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;
- Integrate research and training functions to optimise human resources;
- Maintain and expand the customer base for existing training interventions; while developing innovative new tertiary offerings;
- Secure multi-year resource streams to sustain flagship training offerings, e.g. SDP, GTRIP, YES;
- Explore opportunities to develop and implement MOOC (Massive Open Online Courses) training interventions;
- Develop information material and implement targeted activities to promote and market the NSS;
- Promote opportunities and develop relationships with UNAM and NUST,

together with international partners, to establish Master and PhD courses.

Infrastructure

- Develop a site masterplan for development, with specific reference to construction of staff accommodation and facilities;
 - Develop priorities for the maintenance and upgrading of
 - Gobabeb's infrastructure, with reference to long-term maintenance records and planning;
 - Cost and seek resources for upgrading and construction of accommodation for postgraduate students;
 - Upgrade the solar energy system and evaluate 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.
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Staff (as of 01 March 2018)

Executive Director	Dr Gillian Maggs-Kölling
Office Manager	Ms Elna Irish
Research Coordinator	Dr Theo Wassenaar
Research Manager	Dr Eugene Marais
Accountant	Ms Ileni Hiwilepo
Researcher	Mr Titus Shuuya (NERMU)
	Ms Elbe Becker (NERMU)
	Ms Angela Curtis
	Mr Francois Becker
	Mr Roland Mushi (SASSCAL)
Junior Researcher	Mr Martin Handjaba
	Ms Saima Shikesho
	Ms Jessica Roberts
Interns	Mr Eric Shiningayamwe
	Mr Gregory Golando
FLC Project Coordinator	Ms Hedwig Black
ICT Support Intern	Ms Doris Kinyaga
Hospitality Receptionist	Ms Leena Kapulwa
Housekeeper	Ms Linda Bees
	Ms Selma Swartbooi
	Ms Rita Swartbooi
Technical Team	Mr Josef Gariseb
	Mr Samuel Gowaseb
	Mr Richard Swartbooi
	Mr Jeffrey Khurisab

Staff members, Interns and Volunteers during 2017/2018 (indicating country of origin)

Ms Vicky Amon, NERMU field assistant, Namibia (October – November 2017; February 2018)
Ms Tessa Becker, Training Coordinator, Zimbabwe (May – December 2017)
Ms Monja Gerber, M.Sc. degree student, North West University, South Africa (March 2016 – December 2017)
Mr Oliver Halsey, Photographer/Documentary Producer, UK (March 2016 – October 2017)
Ms Ritha Kapitango, Junior Researcher, Namibia (July 2016 – December 2017)
Ms Monika Leevi, Short-term intern, Namibia (May 2017)
Ms Hannah Liebermann, Grinnell College Fellow, USA (July 2016 – April 2017)
Ms Laetitia Lombard, Office Manager, Namibia (June 2016 – June 2017)
Ms Cassandra Miller, Grinnell College Fellow, USA (July 2016 – April 2017)
Mr Campbell Nell, Junior Researcher, Namibia (April – December 2017)
Ms Nita Pallett, Short-term intern, Namibia (January 2018)
Ms Lara Potsma, Community Tourism Intern, Netherlands (January – April 2017)
Ms Margaret Schmidt, FLC Coordinator, USA (July 2016 – December 2017)
Ms Elizabeth Shilunga, NERMU field assistant, Namibia (October – November 2017; February 2018)
Mr Andre Steyn, Site Management, Namibia (September 2016 – March 2017)
Mr Joseph Tjitekulu, †Aoni (Topnaar) Liaison, Namibia (April 2016 – December 2017)

GTRIP interns 2017 (March – June)

Ms Ester Kayala, UNAM
Ms Petra Mutota, NUST–WIL
Ms Saima Shikesho, UNAM
Ms Elizabeth Shilunga, UNAM

GTRIP interns 2018 (January – February)

Ms Dortea Hamukoto, UNAM
Mr Zazapamue Hange, UNAM
Mr Jonas Lipopila, UNAM
Ms Esther Nambahu, NUST–WIL
Mr Halleluja Shaanika, UNAM

Student affiliates

Ms Ruusa Gottlieb: M.Sc. (Environmental Science) University of Cape Town (completion 2017)
Ms Novald Iiyambo: M.Sc. (Zoology) University of Pretoria (completion 2017)
Ms Esther Uushona: M.Sc. (Chemistry) University of Stellenbosch (completion 2017)
Mr Eric Shiningayamwe: M.Sc. (Rangeland Resources and Management) UNAM (completion 2018)



Financial Overview

The main source of the income for Gobabeb continues to come from projects and affiliation agreements, even though income from these sources has declined by 53.7% over the past two years. That income represents *ca.* 57% of the total estimated income included in the annual budget, down from almost 65% in the previous year. This income was derived from nine on-going projects and signed service agreements, of which four were new. The three largest projects in terms of income during the present financial year are:

1. NERMU – Swakop Uranium Biodiversity Programme
2. Benefit Sharing in the Namib Sand Sea – FLC, Embassy of Finland
3. FogNet – SASSCAL

The second largest income source for Gobabeb is generated through the provision of accommodation, meals, and technical support, contributing more than 32% of total income. Training programmes only contributed *ca.* 8.9% of income through funding secured for signature education and capacity development projects such as SDP and YES. The primary capacity building projects are:

1. Gobabeb Training and Research Internship Programme (GTRIP) – Langer Heinrich Uranium

2. Summer Drylands Programme (SDP) – EIF
3. Livestock and Rangeland Research Capacity Building – NCRST

The MET contribution towards the annual costs of maintenance of infrastructure and capital investment reduced by 86% from previous years. Major commitments from that contributions included:

1. Maintenance of the water treatment plant and water tower;
2. General maintenance of infrastructure.

Future infrastructure investment will concentrate on upgrading of the off-grid solar energy system, priority maintenance and improving infrastructure to monitor and manage resource use.

The overall financial situation of Gobabeb is extremely challenging in the short-term due to severe reductions in funding from almost all local sources, the continuation of severe austerity measures and overall trends of greater competition and lower success rates in competitive opportunities for research and capacity development.

The Annual Report for the Gobabeb Trust, set out on the preceding pages, was approved by the Trustees on 24 October 2018 and is signed on their behalf as below.

Report of the Trustees signed by:


Mr Teo Nghitila
Chair


Dr Anna Matros-Goreses
Vice-Chair

List of Abbreviations and Acronyms

AEROCLO-SA	Aerosols, RadiatiOn and CLOuds in southern Africa
ATV	All-Terrain Vehicle
BPFM	Biophysical Field Methods
DRFN	Desert Research Foundation of Namibia
EIF	Environmental Investment Fund
FLC	Fund for Local Cooperation of the Finnish Embassy
giz	Deutsche Gesellschaft für Internationale Zusammenarbeit
GTRIP	Gobabeb Training and Research Internship Programme
HUB	Humboldt University of Berlin, Germany
ICD9	9 th International Congress of Dipterology
ICT	Information and Communications Technology
IUPUI	Indiana University of Purdue University of Indianapolis, USA
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

NCE	Namibian Chamber of Environment
NCRST	National Commission on Research Science and Technology
NERMU	Namib Ecological Restoration and Monitoring Unit
NPL	National Physics Laboratory, UK
NSS	Namib Sand Sea
NUST	Namibia University of Science and Technology
NWR	Namibia Wildlife Resorts
NWU	North West University, South Africa
SASSCAL	Southern African Science Service Centre for Climate Change and Adaptive Land Management
SDP	Summer Drylands Programme
TIKA	Turkish Cooperation and Coordination Agency
TROPOS	Leibniz Institute for Tropospheric Research, Germany
UCT	University of Cape Town, South Africa
UNAM	University of Namibia
UP	University of Pretoria, South Africa
UNISA	University of South Africa
US	University of Stellenbosch, South Africa
WIL	Work Integrated Learning
WMO	World Meteorology Organization
YES	Youth Environmental Summit

Registered Office

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Auditors

Stier Vente Associates
 Chartered Accountants
 Practice Number 9633
 50 Olaf Palme Street
 P.O. Box 90001
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