

JOINT RESEARCH COLLABORATION AGREEMENT

(herein referred to as "AGREEMENT")

between

Technische Universität Dresden

01062 Dresden

Represented by its Chancellor Dr. Andreas Handschuh

For its Institute of Botany

In 01062 Dresden

(hereinafter referred to as "TU DRESDEN")

Central University of Technology, Free State

20 Brand Street, Willows, Bloemfontein

Represented by its Vice Chancellor Prof A Ngowi

For its Centre for Applied Food Security and -Biotechnology

In 20 Brand Street, Willows, Bloemfontein

University of Kimpa Vita

Rua Henriques Freitas, Nº1, Bairro Popular, CAIXA Postal 77 Uige-Angola.

Represented by its Vice-chancellor for cooperation MSc. Claudia Maria Furtado

Paulo

Telephone: (+244)923338822; (+244)912655840

E-mail: electronico-gabinetereitor@gmail.com; clamafupa@gmail.com

collectively hereinafter referred to as the „PARTIES“

concerning the cooperation in the joint research project

„PropertiesPlants “

(Grant ID: ...)

(hereinafter referred to as the "PROJECT")

A.B.
Luis Furtado

PREAMBLE

The PARTIES intend to work together on the Properties Plants PROJECT. Its intention is to the current project aims to work closely with communities in order to develop human capital that with the ability to identify beneficial plants that can be used for food security, development of natural medicines including bioproducts for socio-economic development. In mitigating climate change, the project will through an ethnobotanical survey investigate various agricultural and botanical methods that will inform future decision-making to encourage sustainable utilization of the plants identified in the current project. We envisage that the project will result in capacity development for researchers, this will facilitate the development of sustainable infrastructure through sharing of best practices among partner universities that can also include indigenous knowledge systems.

This present AGREEMENT is necessary since the PARTIES will integrate the working results that they have generated from individual working packages into an overall working result. The basis of such collaboration shall be this Joint Research Collaboration Agreement, and the related notice on grants provided by the BMBF (project sponsor) or the DLR as its project executing agency to the PARTIES. The cooperation of all PARTIES as described in this agreement shall be the precondition for the success of the PROJECT.

Given the above, the PARTIES conclude the following AGREEMENT:

§ 1 SUBJECT MATTER

- 1.1. The object of this AGREEMENT shall be the cooperation of the PARTIES in the PROJECT, in particular the scientific-technical coordination of the mutually related tasks of the PARTIES.
- 1.2. The relevant scope of work for the individual PARTIES, and the timetable, are provided in the project description appended as Annex A to this AGREEMENT. To the extent that notices on grants contain regulations relating to the PARTIES' cooperation, these shall apply correspondingly taking into account the priority regulation pursuant to § 13.4. Should the provisions of the notices on grants be amended, or should the project sponsor amend regulations relevant to the object of the agreement in any other way, the relevant PARTY affected by such amendments shall immediately inform the other PARTIES accordingly. As far as

A.B.
Carsten Baur

possible, the PARTIES shall take the amendment into account when continuing the PROJECT.

§ 2 COORDINATOR/CONTACT

2.1 The scientific coordination of the cooperation, and the specialist coordination with the project sponsor, shall be the respective responsibility of **Malebo Ntsoaki** (PI) at Central University of Technology, Free State, South Africa (Lead Partner Institute) (hereinafter referred to as the "COORDINATOR"). The COORDINATOR shall have the following responsibilities:

- a) Preparation of uniform status of information among the PARTIES;
- b) Integration of the project results and project documents;
- c) Coordination of the project's activities;
- d) Coordination of the performance of the PROJECT in accordance with the PARTIES' obligations arising from the working description in Annex A, and, if required, in coordination with those responsible for the individual working packages;
- e) Initiation and preparation of project-internal regulations and standards in cooperation with the PARTIES, and monitoring of adherence to these regulations following approval of the PARTIES;
- f) Convening of requisite PARTY meetings;
- g) Coordination of reporting to the project sponsor, to the extent required;

2.2 Designated contacts for the individual packages of tasks shall be:

Technische Universität Dresden

Principle Investigator (PI): Malebo Ntsoaki, +27 51 507 3245,
nmalebo@cut.ac.za

PI: Thea Lautenschläger, +49 351 463 35775, thea.lautenschlaeger@tu-dresden.de

PI: Mawunu Monizi, +244 942 00 91 68, m.mawunu2000@gmail.com

A.B.
B. Ntsoaki

Each PARTY shall be obligated to inform the other PARTIES immediately and in writing concerning a change of its PI or his/her contact details.

- 2.3 The PARTIES shall conduct any potential discussions with the project sponsor both directly and at their own risk. To the extent that such discussions relate to the technical-scientific cooperation with the other PARTIES, the relevant COORDINATOR and the relevant other PARTIES must be informed, and coordinated with closely.

§ 3 PROJECT ORGANIZATION

- 3.1 Each PARTY shall perform its tasks at its own risk corresponding to the project description contained in Annex A, and at its own cost. The PARTIES shall exchange among themselves the technical contents of the task descriptions, timetables, and all information required to perform the PROJECT.
- 3.2 The distribution of tasks within the PROJECT is set out in detail in Annex A of this AGREEMENT.
- 3.3 The PARTIES shall form an executive committee, in which each PARTY participates with one representative. The executive committee shall meet once per year in order to discuss the progress of work and the further planning of the PROJECT.

§ 4 EXCHANGE OF INFORMATION

- 4.1 The PARTIES shall report to each other regularly, and to the extent required in order to conduct the PROJECT, on the status of work on their tasks as well as on the technical experience acquired in the course of such work. These reports shall be documented in writing, if and to the extent to which this is required by at least one PARTY on an individual basis.
- 4.2 The PARTIES shall meet regularly, once per year. Representatives of all PARTIES shall participate in the meetings. The COORDINATOR, or his or her chosen representative, shall chair the meetings.
- 4.3 Should various tasks or activities overlap or be interrelated, the PARTIES shall inform each other of the technical solution for which they are striving, the

A.B.
Gustafsson

timetable, and the scope of such work, and they shall coordinate correspondingly and document the result of their coordination in writing.

- 4.4 The PARTIES shall obligate themselves to communicate to one another the information required to achieve the objectives of the relevant working packages and the PROJECT on the basis of the overall plan, and to communicate the protected working results that they have achieved, to the extent that the PARTIES are entitled to have access to such information. The same shall apply for other protected working results, if and to the extent to which such results are absolutely requisite to the achievement of a project objective.

§ 5 CONFIDENTIALITY

- 5.1 Confidential information shall include all information and data of a technical and commercial nature, which are made available from one PARTY to another as a result of this AGREEMENT, and which are designated as confidential or clearly intended to be confidential.
- 5.2 The PARTIES shall obligate themselves to treat as confidential all confidential information communicated to them by the respective other PARTIES as part of this AGREEMENT for up to three (3) years following the conclusion of the PROJECT, and not to disclose such information to any third parties.
- 5.3 Each PARTY shall disclose confidential information of the other PARTIES to its own employees only if and to the extent to which such disclosure is directly required in order to perform the services described in Annex A of this AGREEMENT.
- 5.4 The PARTIES shall ensure that any of its potential sub-contractors and freelance employees shall be bound to the same obligations of confidentiality as set forth in the above paragraphs.
- 5.5 The above obligations of confidentiality shall lapse if the PARTY that has disclosed the confidential information proves that:
- a) The confidential information is generally known or accessible, without this fact being due to a breach of this confidentiality agreement;

A.B.
Bouffard

- b) The confidential information of a PARTY, irrespective of cooperation as per this AGREEMENT, became known to the disclosing parties on the proven basis of own research and development work;
- c) The disclosing party received the confidential information from third parties independently of this AGREEMENT, without this being based on a breach of this confidentiality agreement;
- d) The disclosing party is required to disclose the confidential information due to the law, administrative or other legal act, or as the result of a legal judgment. In this instance, the PARTY obligated to disclose information according to the above clause shall immediately inform the PARTY whose confidential information is affected in writing and coordinate further procedure with the PARTY whose confidential information is affected.

6. PROTECTION OF PERSONAL INFORMATION AND DATA PROTECTION

6.1 Each Party to this Agreement undertakes to, and shall procure that any of its data operators, agents and contractors comply with the relevant and applicable Data Protection Legislation, and all other applicable data protection legislation and regulations in connection with the performance of its obligations and exercise of its rights under this Agreement.

6.2 With respect to any processing of Personal Information under this Agreement, each Party to this Agreement shall take appropriate technical and organisational security measures against unauthorised or unlawful processing of Personal Information supplied to it by another Party to this Agreement, and against accidental loss or destruction of, or damage to, that Personal Information in accordance with Condition Seven as set out in the Protection of Personal Information Act 4 of 2013.

Each Party to this Agreement undertakes:

- a) to obtain the relevant consent as prescribed within the Protection of Personal Information Act 4 of 2013;
- b) to treat the Personal Information as confidential information in accordance with this Agreement;

A.B.
[Handwritten signature]

- c) not to use, or knowingly permit any third Party to use, or have access to, the Personal Information for any purpose other than as is expressly permitted by this Agreement; and
- d) that it shall not use the Personal Information held by it pursuant to this Agreement, for any purpose that is inconsistent with those purposes notified to the relevant data subject, on or before the time of collection of that Personal Information.
- e) Each Party shall promptly inform the other of any actual or suspected unauthorised access, use or other abuse of the Personal Information and/or any information technology systems relating thereto ("Unauthorised Use") of which it or any of its contractors becomes aware.
- f) Each Party shall at its own cost provide at the other Party's request all reasonable assistance to the requesting Party in relation to the preparation and presentation of the relevant information to the Regulator, or as otherwise required by the applicable legislation for the purpose of prosecuting those individuals responsible for an incident of Unauthorised Use for any legal actions that the requesting Party may bring against third Parties responsible for an incident of Unauthorised Use or to co-operate with any inquiry from any regulator or authority.

§ 7 PUBLICATIONS

7.1 Own WORK RESULTS can be published any time.

7.2 Intended publication of JOINT RESULTS (pursuant to § 8.4) or those WORK RESULTS containing EXISTING PROPERTY RIGHTS (pursuant to § 8.2) must be notified to the affected PARTY prior to publication.

7.3 The PARTY affected may object to the intended publication within a period of 6 weeks following its presentation, in order to ensure that potential patent registrations are not jeopardized by pre-publications that might damage innovative work, or to prevent the disclosure of operating secrets. No publication is permitted during this period, unless permission is already given. If no objection is raised within this period, approval shall be regarded as having been granted.

7.4 Should a PARTY object to an intended publication, such PARTY shall be obligated to submit an alternative proposal for formulation, which preserves its interests, and enables publication to occur.

A.B.
[Handwritten signature]

7.5 Publications may not be delayed or hindered unreasonably. Time frames of graduation theses are being considered.

§ 8 INTELLECTUAL PROPERTY RIGHTS

- 8.1 All knowledge gained by the PARTIES as part of the performance of the PROJECT in the form of intellectual property rights, copyrights, patent applications, and confidential know-how, as well as shares in such, shall represent "WORK RESULTS" within the meaning of this AGREEMENT.
- 8.2 All intellectual property rights, copyrights, patent applications, and confidential know-how of the PARTIES, which are already in existence at the time when this AGREEMENT comes into force, and to the extent absolutely pre-requisite for the cooperation as part of this PROJECT with respect to research and development, shall represent "EXISTING PROPERTY RIGHTS" within the meaning of this AGREEMENT.
- 8.3 WORK RESULTS arising as part of this AGREEMENT shall be attributed to the PARTY whose employees have generated such WORK RESULTS. In this respect, such PARTY shall enjoy the right to file an application for the patent, and shall inform the other PARTIES accordingly.
- 8.4 If WORK RESULTS arise as part of this PROJECT that are generated by members of various PARTIES (hereinafter referred to as "JOINT RESULTS"), these shall be jointly attributed to the respective PARTIES. Within the internal relationship of the PARTIES, the entitlement to JOINT RESULTS shall be determined as per the significance of the relevant scientific contribution. Memoranda concerning the proposals of the individual participating members should consequently be prepared for all JOINT RESULTS generated in connection with this AGREEMENT. In the instance of the application for a patent or utility model, this must occur at the latest four months before the expiry of the priority year (12 months).
- 8.5 No PARTY shall be entitled to assign any of its share rights in the JOINT RESULTS without the written agreement of the other PARTY(S), irrespective of in whose name any potential application has been made.
- 8.6 In the instance of inventions or shares in inventions that arise from work as part of this AGREEMENT, these shall be claimed by the relevant PARTY according to the

A.B.
[Signature]

provisions of the German Employee Inventions Act. In the case of jointly generated inventions, the other PARTIES shall be informed immediately through the sending of copies.

- 8.7 The PARTIES concerned shall coordinate closely when filing applications for or registering any intellectual property rights based on WORK and JOINT RESULTS. The same shall also apply for the utilization of such results. Each PARTY shall bear the costs for patents registered solely in their own name. In all other cases, costs shall be split according to the relevant portion as per the internal relationship, or as agreed in a JOINT OWNERSHIP AGREEMENT to be negotiated by the partners.
- 8.8 The PARTIES mutually agree to notify each other immediately as soon as they become aware of any potential infringements relating to intellectual property rights based on WORK or JOINT RESULTS.
- 8.9 In the instance of an invention that has been generated jointly, the costs of an appeal or revocatory action shall be borne by the PARTIES involved corresponding to the share they own in the invention; the same shall also apply for infringement suits pursued jointly by the PARTIES. If one of the PARTIES pursues a patent infringement claim relating to a jointly generated invention alone, this PARTY shall bear all costs incurred alone, and shall have full entitlement to any potential claim for damages. In such an instance, the other PARTIES shall provide full power of attorney and all declarations required for the conduct of the case.

§ 9 LICENSES

- 9.1 The PARTIES shall grant each other a non-exclusive, non-sublicensable, free of charge and non-transferable license to any WORK RESULTS for the duration and purposes of the PROJECT.
- 9.2 The PARTIES shall also grant each other on request and to the extent legally possible a non-exclusive, non-sublicensable, free of charge and non-transferable license to any EXISTING PROPERTY RIGHTS for the duration and purposes of the PROJECT if this is unquestionable necessary for the conduct of the PROJECT.
- 9.3 Such licenses granted under (1) and (2) above shall, in particular, not entitle an invention or another patentable result to be processed or modified in any way. Any use of WORK RESULTS or EXISTING PROPERTY RIGHTS within the duration of the

A.B

Beaufort Paul

PROJECT shall grant no title or interest whatsoever following the end of the PROJECT or outside of the PROJECT.

9.4 Each PARTY shall on request be granted a non-exclusive, non-transferable license to be negotiated in advance and under fair and reasonable conditions for any intended use of WORK RESULTS that goes beyond the above-mentioned purposes (own commercial use or licensing of WORK RESULTS), or - to the extent legally possible - for any such use of EXISTING PROPERTY RIGHTS. A separate written agreement is to be concluded between the PARTIES affected in each individual case in advance.

In the instance of JOINT RESULTS, the PARTY making use shall render appropriate financial compensation to the other PARTIES entitled to the JOINT RESULT.

9.5 The PARTIES shall be entitled to use the WORK RESULTS developed under this AGREEMENT free of charge and in an unrestricted manner for scientific purposes (research and teaching).

9.6 If either PARTY wishes to relinquish a property right, this party shall first offer such right to the other PARTIES in return for an appropriate compensation; should another PARTY accept the property right offered, it shall acquire unrestricted title thereto. The acquiring PARTY shall in this case also be responsible for payment of the accruing inventor's remuneration.

§ 10 LIMITATION OF LIABILITY

10.1 All PARTIES shall apply best scientific care, and ensure that the recognized technical rules are adhered to when performing the cooperation as part of this AGREEMENT. The PARTIES shall accept no warranty that the results generated as a result of this cooperation shall infringe third-party property rights. However, as soon as such property rights become positively known to one PARTY, this PARTY shall immediately inform the other PARTIES correspondingly. A related obligation to investigate in this respect shall not exist, however.

10.2 The PARTIES shall not be mutually liable for any consequential loss. The PARTIES shall only be liable to one another with respect to wilful intent and gross negligence. In the instance of gross negligence, liability shall be restricted to once the PARTY's share of the total cost of the PROJECT.

AB
[Handwritten signature]

10.3 The PARTIES shall not be liable for any of the following, neither during the duration of the cooperation nor following the end of the AGREEMENT:

- a) The correctness and completeness of the information they communicate as part of this AGREEMENT;
- b) The technical and/or commercial applicability and usability of the information, knowledge, experience, and WORK RESULTS, as well as samples or prototypes provided on the basis of this AGREEMENT; and
- c) Damages of whatever type that arise from the utilization of this information, knowledge, experience, and WORK RESULTS, as well as samples or prototypes.

The provisions in Paragraphs (1) and (2) shall be hereby unaffected.

10.4 To the extent that a PARTY recognizes that it is unable to deliver its project share on time, and/or it is unable to meet the scientific requirements of the PROJECT, it must inform the other PARTIES immediately, specifying the reason thereof and the expected delivery date.

§ 11 TERM/DURATION

11.1 This AGREEMENT shall come into effect when it has been signed by all PARTIES, with effect as of **01 March 2022**, subject to funding being provided to the PARTIES by the **Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL)**(sponsor).

11.2 The AGREEMENT shall end automatically with the acceptance of the conclusion report of the PROJECT by the sponsor or its project executing agency, or three months following the dispatch of the concluding report on the PROJECT to the project sponsors, which has been coordinated among the PARTIES previously, whichever occurs earlier. §§ 5, 6, 7, 8, 9, 10, 13 and 14 shall continue to apply even after the end of the AGREEMENT.

§ 12 EXTRAORDINARY CANCELLATION

AB
[Signature]

12.1 Each PARTY shall be entitled to terminate this AGREEMENT only for an important reason and with 3 months prior notice. An important reason shall be deemed to exist if the cancelling PARTY cannot be expected to fulfil the AGREEMENT by the end of the agreement pursuant to § 11. In particular, an important reason shall be deemed to be the significant restriction or modification of the PROJECT funding by the project sponsors overall, or with respect to the cancelling PARTY, as well as the circumstance that the working results show that the objective of the PROJECT cannot be realized. A further important reason shall be if a PARTY makes a submission for insolvency or bankruptcy.

Notices of cancellation must be communicated in writing to all PARTIES and the project sponsor. The cancellation of one PARTY shall not affect the agreements between the other PARTIES.

12.2 Cancellation shall require written form and is to be sent to the COORDINATOR, who will then inform the BMBF and its project executing agency. Together it shall be discussed, if the work load of the cancelling PARTY can be taken over by a continuing PARTY or by a partner still to be nominated.

12.3 In the event of project cancellation by a PARTY the rights granted to him in § 8 are withdrawn becoming effective on the date of the notice of cancellation. He remains bound to confidentiality according to § 5 and the regulations regarding publication according to § 6. Obligations of the withdrawing PARTY also apply after his withdrawal for all WORK RESULTS and intellectual property rights received as a result of work started or taken over in the framework of the PROJECT.

12.4 The obligations of the other PARTIES according to §§ 5, 7 and 8 of this Agreement only apply to the withdrawing Partner for research results achieved until the notice of termination.

§ 13 DISPUTES

13.1 The participating PARTIES shall amicably settle disputes arising out of or relating to this AGREEMENT, whether they arise during the PROJECT duration or afterwards. Should this be unsuccessful, first the Lead Partner and finally the sponsor shall be asked to help the PARTIES reach a settlement.

A.B.
[Handwritten signature]

13.2 If the dispute is not resolved in this manner, the PARTIES affected shall be entitled to seek judicial help. For this the Partners agree on Dresden as the place of jurisdiction. The laws of the Federal Republic of Germany under exclusion of UN purchasing law shall apply.

§ 14 MISCELLANEOUS

14.1 If a provision of this AGREEMENT is ineffective for legal or factual reasons, this shall not affect the efficacy of the other provisions. The PARTIES shall immediately agree a regulation that best approximates the technical and economic meaning of the unworkable provision to replace the unworkable provision.

14.2 No rights or obligations of the PARTIES arising from this AGREEMENT may be assigned or transferred, in whole or in part, to any third party without the prior written consent of all other PARTIES.

14.3 Oral ancillary agreements have not been made. Amendments and modifications to the text of this AGREEMENT shall only be effective if made in writing. This shall also apply to the derogation of the requirement for written form.

14.4 In the instance of any contradictions, the provisions of the notices on grants shall enjoy precedence over the provisions of this AGREEMENT.

14.5 German Legislation applies.

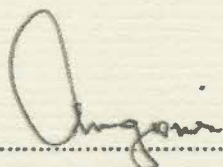
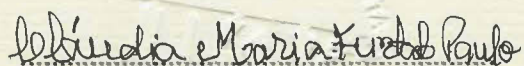
Annexes:

Annex A: PROJECT Description

A-B
Carsten Brühl

For Technische Universität Dresden:

Dresden, date:

.....
The Chancellor.....
Principle Investigator**For Central University of Technology, Free State:**Bloemfontein, date: 09 March 2022.....
The Vice Chancellor and Principal
Prof Alfred Ngowi**For University of Limpopo:**Uitenhage, date: 16 de Março de 2022.....
The Vice Chancellor

Annex A: PROJECT Description

ASSESSMENT OF NUTRITIONAL AND MEDICINAL PROPERTIES OF PLANTS ISOLATED FROM SOUTH AFRICA AND ANGOLA.

I. Cover page providing information about group coordination and collaboration partners as well as identification of the research topic with one of the above priority topics.

The current collaboration will be under SASSCAL theme three which is the Scientific network projects. Under this theme a consortium of researchers from South Africa, Angola and Germany will collaborate under the topic: Assessing nutritional and medicinal properties of plants isolated from South Africa and Angola. The consortium will comprise of Dr NJ Malebo (project leader and coordinator – South Africa); Mr Mawunu Moises (project leader – Angola) and the following collaborators:

Dr Idah Manduna (South Africa)

Mr Thapelo Makhele (South Africa)

Dr Massuquinini Inês (Angola)

All the group's activities will be coordinated by Dr NJ Malebo at the Central University of Technology, Free State (CUT). The coordinator will assign tasks to the different researchers, the researchers will guide the students under each of the planned activities. A progress report based on the different activities will be expected from each of the lead researchers under the respective activities. The collaborative team will decide where the launch and midterm report seminars will be held for this project.

II. Meaningful summary in English and German (goals, research priorities, translation of results).

South Africa and Angola are countries rich with diverse plants that can be utilized for food security, medicinal application and development of bio-products for socio-economic development. However, lack of knowledge about the nutritional composition of the plants and medicinal properties has hampered investigations that could facilitate development of sustainable use of this rich plant diversity. We argue that sustainable agricultural/botanical methods will be difficult to develop and additionally, scientifically informed decision will be difficult to accomplish if there is lack of knowledge (scientific/indigenous) about plants and their potential properties for food security, medicinal use and development of bioproducts. In line with the objectives of the SASSCAL call, the current project aims to work closely with communities in order to develop human capital that with the ability to identify beneficial plants that can be used for food security, development of natural medicines including bioproducts for socio-economic development. In mitigating climate change, the project will through an ethnobotanical survey investigate various agricultural and botanical methods that will inform future decision-making to encourage sustainable utilization of the plants identified in the current project. We envisage that the project will result in capacity development for researchers, this will facilitate the development of sustainable infrastructure for both Southern African countries through sharing of best practices among partner universities that can also include indigenous knowledge systems.

German summary:

Südafrika und Angola sind Länder mit einer Vielzahl von Pflanzen, die für die Ernährungssicherung, die medizinische Anwendung und die Entwicklung von Bioprodukten für die sozioökonomische Entwicklung genutzt werden können. Mangelnde Kenntnisse über die Nährstoffzusammensetzung der

A-B
aufgab Rub

Pflanzen und die medizinischen Eigenschaften haben jedoch Untersuchungen behindert, die die Entwicklung einer nachhaltigen Nutzung dieser reichen Pflanzenvielfalt erleichtern könnten. Wir argumentieren, dass nachhaltige landwirtschaftliche / botanische Methoden nur schwer zu entwickeln sein werden und dass eine wissenschaftlich fundierte Entscheidung schwierig zu treffen sein wird, wenn (wissenschaftliche / einheimische) Kenntnisse über Pflanzen und ihre potenziellen Eigenschaften für die Ernährungssicherheit, die medizinische Verwendung und die Entwicklung von Pflanzen fehlen Bioprodukte. In Übereinstimmung mit den Zielen des SASSCAL-Aufrufs zielt das aktuelle Projekt darauf ab, eng mit den Gemeinden zusammenzuarbeiten, um Humankapital zu entwickeln, das die Fähigkeit besitzt, Nutzpflanzen zu identifizieren, die für die Ernährungssicherheit verwendet werden können, und natürliche Arzneimittel einschließlich Bioprodukte für sozioökonomische Zwecke zu entwickeln. wirtschaftliche Entwicklung. Zur Eindämmung des Klimawandels wird das Projekt im Rahmen einer ethnobotanischen Umfrage verschiedene landwirtschaftliche und botanische Methoden untersuchen, die bei künftigen Entscheidungen zur Förderung einer nachhaltigen Nutzung der im aktuellen Projekt identifizierten Pflanzen eine Rolle spielen. Wir gehen davon aus, dass das Projekt zu einem Kapazitätsaufbau für Forscher führen wird. Dies wird die Entwicklung einer nachhaltigen Infrastruktur für beide südafrikanischen Länder erleichtern, indem bewährte Verfahren unter den Partneruniversitäten ausgetauscht werden, die auch indigene Wissenssysteme umfassen können.

III. Project description:

1. Goals of the project (overall goals, scientific and/or technical working objectives).

The first goal of the project will be divided into three phases:

- Ethnobotanical surveys will be used to identify useful plants within the various SADC regions (CUT; UNIKIV; DRES) – Dr Manduna (project leader for this activity); Researcher from Germany; students from South Africa and Angola. This goal will also be done in collaboration with the Free State Botanical gardens.
- Nutritional analysis of identified plants will be conducted in order to assess their potential use for food security (CUT;UNIKIV) – Dr Malebo and Dr Massuquinini Inês (Angola) in collaboration with postgraduate students
- Assessment of medicinal properties and cytotoxicity effects of plants for development of alternative products and other bioproducts (CUT;UNIKIV) – Dr Manduna; Mr Makhele

Universities that will be involved in the current project include:

- Central University of Technology, Free State
- Bloemfontein Botanical gardens – SANBI
- University of Kimpa Vita and Agostinho Neto University - Angola
- Dresden University, Germany

2. Relevance of the project to the policy goals of the funding measure and potential synergies with existing funding.

The current project intends to ensure food security in South Africa and Angola by verifying the nutritional quality of indigenous vegetables in South Africa and Angola. Additionally, medicinal properties of plants will be assessed for health applications as well as development of bioproducts for socio-economic development.

3. State of the art of science and technology including originality of the research approach.

A.B.
-Confidential-
Raub

The current project attempts to assess nutritional and medicinal properties of plants from South Africa and Angola. Advanced chromatographic techniques that include High Resolution TOFMS Pegasus (GC-HRT) and two-dimensional gas chromatography mass spectrometry will be used to analyse composition of plants for food or medical application. The project will attempt to characterize the composition of unknown plants found in South Africa and Angola, this will be the first time this knowledge is produced, this information will be used to guide future decisions for both countries.

4. Previous work of the applicants and its relation to the SASSCAL Research Portfolio 1.0, the regional research and capacity needs and the thematic context.

The collaborators within this project bring with them a wealth of knowledge from the field of food safety, ethnobotany, chemistry and biomedical technology. The lead researcher has successfully supervised postgraduate students who have since graduated. Dr Manduna has also supervised several postgraduate students that have since graduated. Both these researchers have held grants from the National Research Foundation in South Africa. The background of both researchers indicates their contribution not only towards knowledge generation but contribution to capacity development.

5. Work plan (detailed description of the work of the collaboration partners, including all scientific and technical issues relevant to the project as well as the proposed solutions).

- September-November 2019

Ethnobotanical Survey of plants in Angola and South Africa (Free State Province). Activity will be done by students and Mr Ines from Angola and South Africa to conduct surveys under guidance of Dr IT Manduna. Briefly, information from knowledge holders in Angola and South Africa will be collected through the use of questionnaires. Selected plants will be collected in the Free State region of South Africa or Angola as fresh plants. All plants will be stored carefully and taken to the lab for further analysis. For record keeping purposes, voucher specimens will be collected and documented for identification. The collected plant materials will be placed in the herbarium at the national botanical gardens, Bloemfontein and Dresden University in Germany.

- January 2020- March 2020

Nutritional Survey of wild vegetables and other wild edibles. This activity will be conducted at CUT by students and Dr NJ Malebo. Following extraction, nutritional analysis will be carried out using chromatographic techniques. Advanced chromatographic techniques that include High Resolution TOFMS Pegasus (GC-HRT) and two-dimensional gas chromatography mass spectrometry will be used to analyse composition of plants for food.

Domestication of wild vegetables – this will be done through development of small gardens and greenhouses in Angola and South Africa.

- April 2020-September 2022

Extraction

All collected plants will be taken into the lab and dried in the oven at 40 °C. Dried plants will be finely ground to a powder. The powder plant material will then be stored into airtight containers for further analysis. Extraction of active compounds will be done using acetone, methanol, hydromethanol (20% water, 80% methanol) and water. For the water extraction: the powder plant material will be extracted, by mixing the plant material with distilled water and heating the mixture until it boils. This is done to mimic the way in which traditional healers prepare their medicinal tonics for their patients. For acetone, methanol and hydromethanol extraction: the extracts will be prepared by soaking the powder plant material in each of the solvents separately.

AB
George M. Rub

The mixture will then be placed in a shaker for 72 hours at room temperature. After extraction, the extracts will be filtered using Whatman filter paper grade 01. The filtered extracts will then be evaporated using the rocket evaporator. After evaporation, the water extract will be freeze-dried.

Antimicrobial activity

The antibacterial activity of two plant extracts (acetone and water extracts) will be investigated using microdilution developed by Eloff (1998). The control wells will be respectively filled with culture medium only, bacterial suspension, 5% dimethyl sulfoxide (DMSO) (Nostro et al., 2000; Baris et al., 2006), and plant extract only. Chloramphenicol (0.125 mg/ml) will be used as a positive control. The microwell plates will be incubated for 24 hours, and then 40 microliters of 4mg/ml Iodonitrotetrazolium salt solution will be added to each well. Growth will be indicated by a change of color ranging from pink to violet after 10 to 30 minutes of incubation. The minimum inhibitory concentration (MIC) will be recorded as the lowest concentration at which the plant indicates bacterial growth inhibition.

Phytochemical screening

Phytochemical screening is a method used for extraction, screening, and identification of the medicinally active substances found in plants. Some of the bioactive substances that can be derived from plants are flavonoids, alkaloids, carotenoids, tannin, antioxidants and phenolic compounds (Doughari, 2012). Acetone and water extracts that will be used in this study will be screened for different phytochemicals as done by Al Ghasham et al., (2017). Below are methods done to determine the presence of some phytochemicals:

Alkaloids

0.05 g of plant extract mixed with 2 mL of 1% HCl solution, then slightly heated until steam is visible. Following that, six drops of Wagner's reagent will be added into 1 mL of acidified extract

Flavonoids

50 mg/mL of plant extract will be prepared. 1mL of this plant extract will be added into 1 mL of 10 % lead acetate solution.

Phenols

50 mg/mL of the plant extract will be prepared. 1mL of this plant extract will be added into 0.5 mL of 10 % ethanolic ferric chloride solution.

Tannins

Few drops of 1 % lead acetate will be added into 2 mL of a plant extract with a concentration of 50 mg/mL.

Quinones

In a test tube, 1mL of concentrated sulphuric acid will be added, followed by addition of 1 mL of a plant extract with a concentration of 50 mg/mL.

Antioxidant activity

DPPH scavenging activity

In order to evaluate the antioxidant potential through free radical scavenging by the test samples, the change in optical density of DPPH radicals is monitored. According to Alam et al., 2013 the sample extract (0.2 mL) is diluted with methanol and 2 mL of DPPH solution (0.5 mM) is added. After 30 min, the absorbance is measured at 517 nm.

Anti-inflammatory

Anti-inflammatory refers to the property of a substance to reduce inflammation. The method that is going to be used is the COX inhibition assay as done by (Shaikh et al., 2016).

COX inhibition assay

A.B.
20/01/2020

The assay was performed by using Colorimetric COX (human ovine) inhibitor Screening assay kit.37. Briefly, the reaction mixture contains, 150 ml of assay buffer, 10 ml of heme, 10 ml of enzyme (either COX-1 or COX-2), and 10 ml of plant sample (1 mg/ml). The assay utilizes the peroxidase component of the COX catalytic domain. The peroxidase activity was assayed colorimetrically by monitoring the appearance of oxidized N, N, N, N'-tetramethyl-pphenylenediamine (TMPD) at 590 nm. Aspirin (acetylsalicylic acid, 1 mM) was used as a standard drug.

$$\text{COX inhibition activity (\%)} = 1 - T/C \times 100$$

Where T = Absorbance of the inhibitor well at 590 nm. C = Absorbance of the 100 % initial activity without inhibitor well at 590 nm.

Anticancer

The anticancer method that will be used is trypan blue dye exclusion assay as done by (Chanda & Nagani, 2013).

Trypan blue dye exclusion assay

The trypan blue dye exclusion assay is the most commonly utilized test for cell viability. In this assay, the cells are washed with HBSS (Hank's Buffered Salt Solution) and centrifuged for 10 - 15 min at 10,000 rpm. The procedure is repeated thrice. The cells are suspended in known quantity of HBSS and the cell count is adjusted to 2×10^6 cells/ml. The cell suspension is distributed into Eppendorf tubes (0.1 ml containing 2 lakhs cells). The cells are exposed to drug dilutions and incubated at 37 °C for 3 h. After 3 h, dye exclusion test, that is, equal quality of the drug treated cells are mixed with trypan blue (0.4 %) and left for 1 min. It is then loaded in a haemocytometer and viable and non-viable count are recorded within 2 min. Viable cells do not take up colour, whereas dead cells take up colour. However, if kept longer, live cells also generate and take up colour. The percentage of growth inhibition is calculated using the following formula:

$$\text{Growth inhibition (\%)} = 100 - \frac{(\text{Total cells} - \text{Dead cells})}{\text{Total cells}} \times 100$$

Antidiabetic

The antidiabetic effects of the extracts will be evaluated using the α -amylase inhibition assay and α -glucosidase inhibition assay (Narkhede et al., 2011).

α -Amylase inhibition assay

In different test tubes; 30 μ l of each of the different plant extracts and 10 μ l of 20 mM phosphate buffer (pH 6.9) will be added to 20 μ l human salivary α -amylase (1 mg/ml); and incubated in a water bath at 37 degree Celsius for 30 minutes. Afterwards, 90 μ l of a 1% soluble starch will be added to each test tube, to act as a substrate for the reaction, and incubated further at 37 degrees Celsius for 20 minutes. Then the reaction will be stopped with the addition of 50 μ l DNS colour reagent (1% 3,5-dinitrosalicylic acid and 12% potassium sodium tartrate (S6170) in 0.4 M NaOH), and the mixture will be heated in a boiling water bath for 5 minutes and allowed to cool down to room temperature. The reaction mixture will then be diluted with 500 μ l distilled water in an ice bath. All the tests will be done in triplicate at a final concentration of 200 μ g/ml.

The control test tubes will be prepared with 40 μ l phosphate buffer and 20 μ l α -amylase. The blank will be prepared with 60 μ l of phosphate buffer without the enzyme and the inhibitor tubes with 10 μ l phosphate buffer, 20 μ l α -amylase and 3 μ l acarbose (1 mg/ml) or α -amylase inhibitor from wheat seed (1 mg/ml). the solvent control tubes will be prepared with 10 μ l phosphate buffer, 20 μ l α -amylase and 30 μ l solvent (10% ethanol).

AB
Gurpreet Singh

The extracts which shows inhibition on α -amylase will be recognized by a pale brown colour.

In vivo cytotoxicity assay

The cytotoxic in vivo brine shrimp lethality tests will be carried out by using brine shrimp *Artemia salina* (Leach) larvae, according to the methodology described by Nino et al. (2006). Each plant extract will be tested at 1.00, 0.10, and 0.01 mg/ml and evaluated by triplicate. The methanol plant extracts will be dissolved in water and those from hexane and dichloromethane will be dissolved in the same solvents following evaporation for 16 h. After that, 10 ml of artificial sea water will be added to each vial. As positive control, gallic acid will be used. In all cases, as a negative control, each solvent to dissolve the original extract will be used. Mortality percentage (% M) for each concentration will be calculated by applying the Abbot formula. Lethal concentration 50 (LC50; in mg/ml) will be determined for each plant extract by interpolation in the graph from the mortality percentage versus the concentration in mg/ml and through a linear regression analysis with the program Microsoft Excel. The cytotoxic activity will be considered weak when the LC50 is between 0.50 and 1.00 mg/ml, moderate when the LC50 is between 0.10 and 0.50 mg/ml, and designated as strong when the LC50 range from 0 to 0.10 mg/ml.

Isolation

Plants occur as a combination of many types of phytochemicals with varying polarities. In isolation, it is a common practice for different separation techniques such as TLC, flash chromatography, Sephadex chromatography, HPLC and column chromatography, to be used to get pure compounds (Sasidharan et al., 2011). For this study, the selected method of isolation is column chromatography combined with TLC.

Liquid chromatography

- Liquid-liquid chromatography: this method is used to separate samples according to their polarity. The separation is based on the interactions of the samples with stationary and the mobile phase (chem.libretexts.org, 2018).
- High Performance Liquid Chromatography (HPLC): Separates compounds based on their interaction with solid particles and the mobile phase solvent. This method is useful for separating compounds that can decompose under high temperatures. (Raaman, 2006).

6. Description of capacity development measures and allocation of resources for scientific exchange within the research group.

Funding will be set aside for to support Masters and PhD students. Additionally, funding will be set aside to enable travel of researchers for training and capacity development purposes in South Africa and Germany. Funding will be set aside for the launch of the project and midterm report of progress.

7. Project management and division of labour between the partners (please summarize in a table or bar graph: synergies and dependencies, assignment of the relevant work packages, cooperation with third parties and the institution SASSCAL).

September-November 2019	January 2020- March 2020	April 2020-September 2022
✓ Ethnobotanical Survey of plants in Angola and South	✓ Sample Identification, collection and	✓ Sample extraction and Phytochemical Screening and

A-B
Grafisch

Africa (Free State Province). Activity will be done by students and Mr Ines from Angola and South Africa to conduct surveys under guidance of Dr IT Manduna. ✓ Nutritional Survey of wild vegetables and other wild edibles. This activity will be conducted at CUT by students and Dr NJ Malebo. ✓ Sample Identification, collection and Botanical Authentication. The identification and botanical authentication will be done at the CUT in collaboration with the Free State Botanical gardens in South Africa and Dresden	Botanical Authentication. The identification and botanical authentication will be done at the CUT in collaboration with the Free State Botanical gardens in South Africa and Dresden University in Germany. ✓ Scientific equipment capacitation of Kimpa Vita and Agostinho Neto University, Angola. An analysis of basic equipment for sample drying and extraction will be done by Dr Malebo and researchers from Agostinho Neto and Kimpa Vita University. ✓ Sample extraction and Phytochemical Screening and profiling of	profiling of selected plants. Activity to be done by students at CUT under guidance of Dr Manduna; Dr Mfengwana and Mr Makhele. ✓ Nutritional Analysis and profiling. This activity will be conducted at CUT by students and Dr NJ Malebo. ✓ Pharmacological and biological potential analysis: ✓ Anti-microbial potential (malaria, bacterial and fungal) ✓ Anti-Inflammatory Potential. ✓ Chemo preventive and cancer treatment potential. ✓ Anti-diabetic potential. ✓ Stomachache All activities above will be done by
--	---	--

A.B.
Gauteng

University in Germany.	selected plants. Activity to be done by students at CUT under guidance of Dr Manduna; Dr Mfengwana and Mr Makhele. ✓ Nutritional Analysis and profiling. This activity will be conducted at CUT by students and Dr NJ Malebo.	students at CUT under guidance of Dr Manduna; Dr Mfengwana and Mr Makhele. ✓ Product development: ✓ <i>In Vivo</i> testing of products. ✓ Herbal Remedies and Juices (Products for the Global market) This activity will be conducted at CUT by students and Dr NJ Malebo and Mr Makhele in collaboration with the University of Pretoria. ✓ Food and Supplements (Global Market). This activity will be conducted at CUT by students and Dr NJ Malebo and Mr Makhele in collaboration with the University of Pretoria.
--------------------------------------	--	---

8. Concepts for utilization of results and data management.

A.B.
Breyer

Plant materials will be stored in South Africa and Germany until a herbarium for plant storage is setup in Angola. All scientific data generated in the current study will be first be shared during joint scientific workshops/conferences among research partners. The data will eventually be published in scientific papers and conferences. Data that require patenting will be handled by the respective partners and all partners will equally share on the IP generated. IP generated using plants from Angola will be protected to ensure citizens of Angola benefit from such IP. This will also be done with plants isolated from South Africa.

9. Financial plans comprising estimated expenses/costs per collaboration partner and individual item (envisaged staff, equipment, travel expenses, investments).

<u>Item</u>	<u>Budget</u>
<u>Plant collection:</u> • Collection and Transportation Permits (Angola, RSA, Germany and Namibia). • Collection and Transportation Permits. • Flights and Shuttles. • Accommodation and Camping • Botanical Identification and Authentication, Sample storage. • Mountain Equipment: ○ GPS and Topo Maps ○ 4-wheel drive with diff locks and winch rental. ▪ Roof tent ○ Mountain Medical Rescue Priority (Satellite Phone) ○ Canvas tents ○ Clothing and hiking gear (rain and adverse weather gear).	• +/-R200 000 (US\$13000-15000)
<u>Project Expenses:</u> • Plant Material Preparation and Extraction @R1500.00 per 1Kg of sample per solvent. • Phytochemical Screening and profiling of selected plants. • Nutritional Analysis and profiling of selected edibles. This will include reagents for Chromatographic analysis of vegetables • Pharmacological and biological potential analysis. • Product development: ○ In Vivo testing of products. ○ Herbal Remedies and Juices (Products for the Global market)	• +/-R300 000 (US\$16000-20000)

Handwritten signature and initials

– funds will be used to pay laboratory use at University of Pretoria for shelf-life studies and sensory evaluation of juices. ○ Food and Supplements (Global Market). ○ Domestication of Wild edibles	
<u>Capacity Development:</u> • Scientific Infrastructure Development: ○ Laboratory equipment = Kimpa Vita and Agostinho Neto University – This will be limited to basic equipment for plant drying and extractions. ○ Laboratory Training Workshops and certification ○ Laboratory equipment calibration and validation. Joint launch event (Travelling costs) ○ Midterm status seminar (Travelling costs) • English/Portuguese workshops • Scientific Publications and Conference Presentations – for communication of research outputs. • Educational Seminars and Workshops for launching of project and communication of status of research project. • Funds will be set aside to support students who will be studying in South Africa for accommodation and monthly allowances for food and transport.	• +/-R500 000 (US\$33000-35000)

AB
[Handwritten signature]



Central University of
Technology, Free State

MEMORANDUM OF UNDERSTANDING

entered into and between

**THE CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE,
SOUTH AFRICA**

and

UNIVERSITY KIMPA VITA , ANGOLA

MEMORANDUM OF UNDERSTANDING

between

THE CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE, SOUTH AFRICA

a university duly established under the Higher Education Act No 101 of 1997 herein represented by the acting Vice-Chancellor and Principal (Prof Henk de Jager), duly authorized thereto and acting by virtue of delegated authority

(hereinafter referred to as "the CUT")

and

UNIVERSITY KIMPA VITA, ANGOLA

A public University based in Uige, Angola.

(hereinafter referred to as "UNIKIVI")

(the "Partner Institutions")

PREAMBLE

Recognising the mutual benefits to be gained through a cooperative programme promoting scholarly activities and international understanding, the Parties enter into this Memorandum of Understanding ("Agreement") and agree to the following:

1. Objectives

This Agreement establishes a framework for the negotiation of the proposed cooperation between the Partner Institutions (the details of each activity of cooperation which is to be contained in separate implementation agreements ("Implementation Agreements") as set out hereunder), which shall include, but not be limited to-

- 1.1. the development of collaborative research projects;
- 1.2. the exchange of research materials, publications and information;
- 1.3. the organisation of joint academic, technical and scientific activities, such as courses, conferences, seminars, symposia or lectures;



- 1.4. the development and operation of joint academic programs;
- 1.5. the exchange of research and teaching personnel;
- 1.6. the exchange of students;
- 1.7. the exchange of publications and other materials of common interest; and
- 1.8. co-operation in the recruitment of students to the two institutions.

The cooperation between the Parties may occur in any of the fields offered at the Partner Institutions.

2. Implementation

In order to carry out and fulfil the aims of this Agreement, the Partner Institutions shall each appoint a coordinator ('the Coordinator') who shall manage the development and conduct of joint activities.

Either Party may initiate proposals for activities under this Agreement and such proposals shall be communicated to the Coordinator of the other Partner Institution.

Specific details of any activity of cooperation between the Partner Institutions shall be set forth in an Implementation Agreement(s), which shall become an integral part of this Agreement upon signing by the authorized signatories at each Partner Institution and shall be attached to this Agreement as an annexure. The Implementation Agreements shall regulate matters, including, but not limited to, the number and period of student and staff exchange, budgets and sources of financing, the responsibilities of each Party for the agreed upon activity and other items necessary for the efficient achievement of the activity of cooperation.

Nothing shall diminish the full autonomy of either institution, nor will any constraints or financial obligations be imposed by either party upon the other in carrying out the Agreement.

It is not intended that the Agreement shall give rise to any legal rights or obligations between the two institutions.

3. Duration and termination of the Agreement

This Agreement shall become effective on the date that it is signed by all Parties and shall be valid for a period of 5 (FIVE) years, but may be renewed or extended by mutual consent of the Parties.

This Agreement may be terminated by either Party at any time provided that the terminating Party gives written notice of its intention at least 6 (SIX) months prior to termination. The termination of this Agreement will however not affect the validity of the Implementation Agreements concluded between the Partner Institutions in terms of this Agreement, and the Implementation Agreements shall remain to be in force for the duration stipulated in such Implementation Agreements.



4. Status of Agreement

It is specifically recorded that this Agreement does not constitute a binding agreement between the Parties with the exception of this clause 4 and clauses 3, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14 which shall be binding on the Parties.

5. Breach

Should any Party (the "guilty party") commit a breach of this Agreement and fail or refuse to rectify that breach within 14 (FOURTEEN) days after receipt of a written notice from the other Party (the "innocent party"), calling upon the guilty party to rectify that breach, the innocent party shall be entitled, without prejudice to any other of his rights, to forthwith cancel this Agreement by written notice to the guilty party.

Notwithstanding any provision to the contrary in this Agreement, no Party shall be entitled to institute any delictual, contractual or other claim against any of the other Parties for any indirect or consequential losses or damages (including without limitation, loss of profit, loss of use, loss of production, loss of business, or loss of business opportunity) due to any cause whatsoever.

6. Status of Partner Institutions

It is recorded that, notwithstanding any provision to the contrary or any provision which could be construed to the contrary, the status of the Parties in relation to each other shall be that of independent parties, and none of them shall under any circumstances and for any purposes whatsoever be deemed to be associates or partners of each other. The Parties hereby specifically record that they are contracting on an independent basis, and that neither of them has the authority to bind or act on behalf of the other, and that this Agreement shall not constitute a partnership.

7. Confidential Information

The Parties acknowledge that they may, in the course of this Agreement and during the negotiation of the Implementation Agreements, gain access to and become acquainted with the techniques, methods and processes, trade secrets, data, information technology, software, business associates, clients, and other private, sensitive and confidential information ("Confidential Information") of the other Parties.

The Parties accordingly undertake, for the duration of this Agreement as well as after the termination thereof, not to directly or indirectly, utilize, disclose or make public to any third party any Confidential Information of the other Parties and to keep any Confidential Information secret and confidential at all times, unless such disclosure takes place in the ordinary course of the carrying out by a Party of its obligations in terms of this Agreement.

The Confidential Information shall not include-

- i) information which was known to a Party prior to its receipt from another Party;



- ii) information which is or lawfully becomes generally available to the public;
- iii) information which is lawfully acquired from third parties who have a right to disclose such information;
- iv) information which by mutual agreement is released from confidential status; and
- v) information which is required to be disclosed in response to a valid order of court or other governmental agency or if disclosure is otherwise required by law, and a Party will provide the other Party with prompt written notice if such disclosure is required, and shall limit the disclosure to the minimum necessary to comply with the law.

8. Marketing and Publicity

None of the Parties to this Agreement shall use the name, symbols, branding or marks of another Party in any publicity, advertising or announcement, without the other Parties' prior written approval.

9. Entire Agreement

This Agreement contains all the terms and conditions of the agreement between the Parties concerning the subject matter thereof and no terms, conditions, warranties or representations whatever apart from those contained in this Agreement have been made or agreed to by the Parties.

10. Non-Variation

No variation or consensual termination of this Agreement or any part thereof shall be of any force or effect unless in writing and signed by or on behalf of the Parties.

11. Indulgence

No relaxation or indulgence which a Party may grant to the another Party in regard to that Party's obligations in terms hereof shall constitute a waiver of or prejudice any of the first Party's rights in terms hereof.

12. Dispute Resolution

Any dispute arising from or in connection with this Agreement or its termination, shall in the first instance be referred to the respective chief executive officers of the Parties to the dispute, failing whom, their respective equivalents or nominees ("the representatives"). Should the representatives be unable to resolve the dispute within 20 (TWENTY) days after the referral of the dispute to them, the dispute shall, at the request of any party to the dispute, be dealt with as provided as set out below.

Any dispute arising from or in connection with this Agreement or its termination, which has not been resolved pursuant to the above clause shall, if so requested by any Party to the dispute, be finally resolved in accordance with the (United Nations Commission on International Trade Law ('UNCITRAL') Arbitration Rules and the award of the Arbitrator shall be binding on both parties.



In accordance with the UNCITRAL Arbitration Rules the Parties agree as follows:

The appointing officer shall be a practicing counsel or attorney of not less than 10 (TEN) years standing.

The number of arbitrators shall be: 1 (one)

The place of arbitration shall be: Bloemfontein, South Africa

The language shall be: English

13. Notices

All notices given by a Party to the other in terms of this Agreement shall be given in writing by pre-paid registered post or telefax, or delivered by hand –

if to CUT, at:

Address: 20 President Brand Street, Westdene, Bloemfontein, 9300

Postal address: PO Box X20539, Bloemfontein, 9300

Facsimile number: _____

Electronic mail address: kc@cut.ac.za

Marked for the attention of: Prof. Henk de Jager

if to MSU, at:

Address: 01 Henriques Freitas Street, Uige, Angola

Postal address: PO box 77, Bairro Popular, Uige, Angola

Facsimile number: _____

Electronic mail address: _____

Marked for the attention of: Prof. João F. de Sousa Gaspar da Silva

or such other address as a Party may inform the other Parties in writing, which address will not be a *post restante*, and shall be deemed to have taken effect 14 (FOURTEEN) days after posting of the required written notice.

A notice -



- i) given by registered post, will be deemed to have been received 5 (FIVE) days after the date of posting thereof;
- ii) sent by telefax, shall be deemed to have been received on the first working day following the date of transmission of such notice;
- iii) delivered by hand shall be deemed to have been received on the date of delivery thereof.

Notwithstanding anything to the contrary contained or implied in this Agreement, a written notice or communication actually received by a Party from another, including by way of facsimile transmission, shall be adequate written notice or communication to such Party.

The Parties choose as their *domicilium citandi et executandi* for all purposes under this Agreement at the addresses referred to in this clause 13.

14. Applicable Law

The interpretation of this Agreement and the adjudication of any claim or dispute arising therefrom, shall be in accordance with the Laws of the Republic of South Africa and each and every cause of action shall be regarded as having arisen within the jurisdiction of the Courts of the Republic of South Africa.

In the spirit of international friendship and cooperation, we hereby set our signatures.

Signed on behalf of

Signed on behalf of

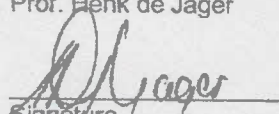
University Kimpa Vita

Central University of Technology,
Free State

Prof. João F. de Sousa Gaspar da Silva

Prof. Henk de Jager

Signature



Signature

Date: _____

Date: 25/06/2018

CONTRATO DE COLABORAÇÃO DE PESQUISA CONJUNTA

(aqui referido como "ACORDO")

Entre Technische Universität Dresden

01062 Dresden

Representado pelo seu Chanceler Andreas Handschuh

Para o seu Instituto de Botânica

Em 01062 Dresden

(doravante referido como "TU DRESDEN")

Nome da Instituição

Endereço

Representado por Função, Nome

Para o seu Instituto de...

No endereço

UNIVERSIDADE KIMPA VIDA

Rua Henriques Freitas, Nº1, Bairro Popular, CAIXA Postal 77 Uíge-Angola.

Representante para a área da cooperação- MSc. Cláudia Maria Furtado Paulo

Telefone: (+244)923338822; (+244)912655840

E-mail: gabinetereitor@gmail.com clamafula@gmail.com

Nome da Instituição

Endereço

Representado por Função, Nome

Para o seu Instituto de No endereço

coletivamente doravante denominados "PARTES" sobre a cooperação no projeto de pesquisa conjunta "Propriedades Plantas" (ID da concessão: ...) (doravante referido como o "PROJETO")

PREÂMBULO

As PARTES pretendem trabalhar em conjunto no PROJETO de Plantas de Propriedades. Sua intenção é que o projeto atual visa trabalhar em estreita colaboração com as comunidades, a fim de desenvolver capital humano que tenha a capacidade de identificar plantas benéficas que possam ser usadas para segurança alimentar, desenvolvimento de medicamentos naturais incluindo bio-produtos para o desenvolvimento socio-econômico.

Na mitigação das mudanças climáticas, o projeto irá, por meio de uma pesquisa etnobotânica, investigar vários métodos agrícolas e botânicos que informarão a tomada de decisões futuras para incentivar a utilização sustentável das plantas identificadas no projeto atual.

Prevemos que o projeto resultará no desenvolvimento de capacidades para pesquisadores, o que facilitará o desenvolvimento de infra-estrutura sustentável por meio do compartilhamento de melhores práticas entre universidades parceiras que também podem incluir sistemas de conhecimento indígenas.

O presente CONTRATO é necessário, pois as PARTES integrarão os resultados de trabalho que geraram de pacotes de trabalho individuais em um resultado de trabalho geral.

A base de tal colaboração será este Acordo de Colaboração em Pesquisa Conjunta e o aviso relacionado sobre subsídios fornecido pelo BMBF (patrocinador do projeto) ou pelo DLR como sua agência executora do projeto às... PARTES. A cooperação de todas as Partes, conforme descrito neste acordo, será a pré-condição para o sucesso do PROJETO.

Diante do exposto, as PARTES celebram o seguinte CONTRATO:

§ 1

1.1. O objeto deste ACORDO será a cooperação das PARTES no PROJETO, em particular a coordenação técnico-científica das tarefas mutuamente relacionadas das PARTES.

1.2. O escopo de trabalho relevante para as PARTES individuais e o cronograma são fornecidos na descrição do projeto anexada como Anexo A deste CONTRATO.

Na medida em que os avisos de subvenções contenham regulamentos relativos à cooperação das Partes, estes aplicar-se-ão correspondentemente tendo em conta o regulamento de prioridade nos termos do § 13.4.

Caso as disposições dos avisos de subvenções sejam alteradas, ou caso o patrocinador do projeto altere os regulamentos relevantes ao objeto do acordo de qualquer outra forma, a PARTE relevante afetada por tais alterações deverá informar imediatamente as outras PARTES. Na medida do possível, as PARTES levarão em consideração a alteração na continuidade do PROJETO.

§ 2 COORDENADOR/CONTATO

2.1 A coordenação científica da cooperação e a coordenação de especialistas com o patrocinador do projeto serão de responsabilidade de Malebo Ntsoaki (PI) na Central University of Technology, Free State, África do Sul (Lead Partner Institute) (doravante referido como o "COORDENADOR"). O COORDENADOR terá as seguintes responsabilidades:

- a) Elaboração do status uniforme das informações entre as PARTES;
- b) Integração dos resultados do projeto e documentos do projeto;
- c) Coordenação das atividades do projeto;
- d) Coordenação da execução do PROJETO de acordo com as obrigações das PARTES decorrentes da descrição de trabalho constante do Anexo A e, se necessário, em coordenação com os responsáveis pelos pacotes de trabalho individuais;
- e) Iniciação e preparação de regulamentos e normas internas do projeto em cooperação com as PARTES, e monitoramento da aderência a esses regulamentos após a aprovação das PARTES;
- f) Convocar as necessárias reuniões da PARTE;
- g) Coordenação do reporte ao patrocinador do projeto, na medida do necessário;

2.2 Os contatos designados para os pacotes individuais de tarefas devem ser:

Technische Universität Dresden

Investigador principal (PI): Malebo Ntsoaki, telefone, endereço de e-mail

...

PI: Thea Lautenschläger, +49 351 463 35775, thea.lautenschlaeger@tu-dresden.de

...

PI: Monizi Mawunu, +244 942 00 91 68, m.mawunu2000@gmail.com

Cada PARTE será obrigada a informar as outras PARTES imediatamente e por escrito sobre uma mudança de seu PI ou seus detalhes de contato.

2.3 As Partes conduzirão quaisquer discussões potenciais com o patrocinador do projeto

Mais sobre o texto original. É necessário fornecer o texto original para ver mais informações sobre a tradução

Enviar feedback

Painéis laterais

Histórico

Salvas

Contribuir