

STRENGTHENING CAPACITY OF YOUTH IN SUPPORT OF EMERGING
AGRICULTURAL INDUSTRIES IN AFRICA: LESOTHO'S CANNABIS INDUSTRY AND
THE ROLE OF HIGHER EDUCATION IN ITS HUMAN RESOURCE DEVELOPMENT

A Project Paper

Presented to the Faculty of the Graduate School

of Cornell University

in Partial Fulfillment of the Requirements for the Degree of

Master of Professional Studies in Agriculture and Life Sciences

Field of Global Development

by

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August 2020

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ABSTRACT

The concept described as the economic growth potential that can result from shifts in a population's age structure, mainly when the share of the working-age population (15 to 64) is larger than the non-working-age share of the population (14 and younger, and 65 and older) is called the demographic dividend. Although the demographic dividend presents an opportunity for economic growth, if economic opportunities are not robust and fully serve the growing population, then there are concerns that this could lead to severe political and social conflict. The presence of disproportionately large youth groups that are not being economically empowered is one popular explanation for rises in violence. With a demographic dividend on the horizon, African countries must capitalize on this moment by providing training, education and employment opportunities to develop its future workforce and mitigate the risk of a potential uprising as communities need to be prepared as demographic shifts increase demand for skilled workers to support growing industries.

With demographic shifts and increases in the youth population, one sector to explore in sourcing opportunities for citizens is in agriculture. Agriculture in Africa has a massive social and economic footprint as more than 60 percent of the population of sub-Saharan Africa is smallholder farmers and 23 percent of sub-Saharan Africa's GDP comes from agriculture. A valuable agricultural market is emerging as countries across Southern Africa are legalizing cannabis cultivation for medicinal and research purposes. Cannabis cultivation for medicinal use and export has been legalized in Lesotho, an enclaved country within the border of South Africa. Licensed cannabis cultivation has also been legalized in Zimbabwe for medicinal and research purposes and decriminalized in South Africa for private cultivation and consumption. Lesotho is unique as it was the first country on the continent to legalize cannabis cultivation for medicinal use and is

gaining momentum as Canadian companies are investing in the industry by taking equity in local firms, obtaining local licenses and building cannabis production facilities. Recognizing the promise of this emerging agricultural industry, it will be important to understand the cannabis industry's potential growth in Lesotho and how the growth of the industry can create employment opportunities and increased investment in education platforms can help build the skills of Basotho people, specifically the youth, to participate fully in the success of the industry.

The methods and procedures used in this research project involve a literature review, face-to-face and telephone interviews with educators, agriculture specialists, agripreneurs and health economists. The results of this study conclude that increased investment in higher education platforms through government, private sector support and tertiary-level academic partnerships will prepare Basotho people to support an emerging agricultural industry that can position the country as a leader in the global cannabis industry.

BIOGRAPHICAL SKETCH

Originally from Lexington, Kentucky, DeAndre Uwakonye is a Global Development Master of Professional Studies (MPS) candidate in International Agriculture and Rural Development (IARD) at Cornell University. His research and project interests include establishing education platforms to strengthen capacity of youth in support of emerging agricultural industries in developing countries. Prior to attending Cornell, DeAndre worked as Associate Director of Projects for a management consulting firm based in Lusaka, Zambia focused on technology for health, HIV treatment and prevention programming, public-private partnerships and youth development. In his role, he managed USAID and Bill and Melinda Gates funded programs leading teams in Zambia, Lesotho, South Africa and Malawi in the development of program management and country specific strategies for international NGOs, government and private sector organizations.

DEDICATION

This study is dedicated to my beautiful mother, Deatra Henderson, who has always been my source of inspiration and given me strength in difficult times.

To my Uncle and Aunt, Keith and Angela Henderson who have always supported me while I navigate life and living.

To my Great Uncle and Aunt, Bob and Bertie Brown who inspired me to travel, explore and not be afraid to try new things.

To my mentors, Greg Marchand and Jamal K. Atkins. Thank you for being patient and giving me the space to make mistakes and learn from those mistakes as I worked to find my way in the field of international development. My gratitude is endless.

The journey to this point has been long and hard but to my friends and family, thank you for giving me the strength, protection and skills to impact the world.

ACKNOWLEDGEMENTS

Foremost, I would like to express my sincere gratitude to my Advisor Professor Jeff Perry. Upon meeting you, I was relieved as I felt you really understood my vision and passion for strengthening capacity of youth in Africa, the potential of growing emerging agricultural industries and establishing platforms that will build the next generation of cannabis thought leaders and entrepreneurs in Africa.

Besides my Advisor, I would like to thank Professors Lori Leonard and Terry Tucker. It was an honor to be a part of such a diverse cohort. Thank you for supporting my research and always making time to meet as I was trying to figure out how to get the most value out of my time at Cornell.

Thank you to Lesoetsa Makafane for being a good friend and always helping me navigate the ins and outs of Lesotho. I appreciate your insights and contribution to my research, and I hope that we will work together to one day build something amazing for African people across the Diaspora.

Thank you to Sara Evanega for believing in my ability to execute my research and funding my trip to Lesotho. You are greatly appreciated.

Finally, I would like to thank Dr. Makoala Marake and the National University of Lesotho for always making time for me and supporting my efforts to serve the youth of Lesotho.

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I. THE DEMOGRAPHIC DIVIDEND: AFRICA'S POPULATION BULGE

The United Nations defines youth as people between the ages of 15 and 24. About half the world's people are under the age of twenty-five, 1.5 billion of them are youth, and 86 percent of them live in the developing world (World Bank 2006: 33, 4). It is predicted that by 2050, 86 percent of the world's extreme poor will live in sub-Saharan Africa and the youth population will increase by 50%. The region of sub-Saharan Africa has the most youthful population in the world. Of the forty-six countries and territories where at least seventy percent of the population is under the age of 30, only seven are not in Sub-Saharan Africa (Leahy et al. 2007: 87–91). Although Africa has a youth-dominated population, African government policies are often not youth-centered and African governments and their international supporters are frequently under-informed about the priorities of most youth. Nevertheless, considering these projections, there should be increased human capital investments to mitigate risks of insecurity or instability and promote local leadership and innovations to combat poverty and increase equity among African people within local and lucrative industries. Some of the world's fastest growing economies are African nations, and although there are examples of rapid economic growth, in many instances, vulnerable communities do not receive the bulk of the benefits. If Africa's human capital investment fails to match its economic growth, it could ultimately retard Africa's economic development.

The economic growth potential that can result from shifts in a population's age structure, mainly when the share of the working-age population (15 to 64) is larger than the non-working-age share of the population (14 and younger, and 65 and older) is called the *demographic dividend*.¹ Although

¹ Bloom, D. E., Canning, D., & Sevilla, J. (2003). *The demographic dividend: a new perspective on the economic consequences of population change*. Santa Monica, CA: RAND.

the demographic dividend presents an opportunity for economic growth, if economic opportunities are not robust and fully serve the growing population, then there are concerns that this could lead to severe political and social conflict. The presence of disproportionately large youth cohorts that are not being economically empowered is one popular explanation for upticks in violence. With a demographic dividend on the horizon, African countries must capitalize on this moment by providing training, education and employment opportunities to develop its future workforce and mitigate the risk of a potential civil unrest as communities need to be prepared once demographic shifts increase demand for skilled workers to support growing industries. One sector with tremendous potential to explore in sourcing opportunities for citizens is in agriculture which has a massive social and economic footprint as more than 60 percent of the population of sub-Saharan Africa is smallholder farmers and 23 percent of sub-Saharan Africa's GDP comes from agriculture. Devising ways to take advantage of this population bulge by identifying new opportunities and funneling much of the working age population into emerging agricultural industries could foster a new era in farming.

II. CANNABIS IN AFRICA

Cannabis has been employed in traditional African herbal medicine since the beginning of time. It is thought that smoking pipes were first invented in sub-Saharan Africa as early as 600BC and traces of cannabis have been found in Egyptian mummies - used by ancient Egyptians to ward off depression and other psychological illnesses. The multi-billion-dollar global cannabis industry is growing rapidly as people become more privy to the benefits of treating pain and inflammation and potential treatment for mental illness and addiction. By 2028, the global legal cannabis market

could be worth \$272bn according to the 2018 European Consumer Staples Report from Barclays. Around the world, countries are considering deregulation to generate increased foreign direct investment and diversify their economies. For many, illegal cultivation of cannabis is a key source of income for impoverished rural areas in countries across the continent of Africa. The United Nations estimates that over 38,000 tons of cannabis are produced across Africa each year. Although Africa is the world's biggest producer and consumer of cannabis, the continent's legal industry is still in its early stages. With pro-business legislation and a strong regulatory framework to support the creation of high-quality pharmaceutical products, the industry has the potential to make 7.1 bn annually by 2023.

Currently, the majority of the world's cannabis grown for medicinal use is cultivated in the Netherlands and Canada but creating the right production climate requires plentiful energy and groundwater.² Parts of the continent with warm climates, rich soil, low-cost land and a labor with a strong horticultural skill base have the potential to be pivotal markets for cultivation. Africa's potential as a production hub creates long term value within the market as North American and European companies will eventually look to outsource their cultivation model in an attempt to cut costs. Many African countries have been negatively impacted by a decline in demand for key cash crops such as tobacco and are looking for new ways to diversify their economies and generate foreign exchange earnings. Despite Africa's potential as a prime exporter, cannabis is still illegal in most African countries, but South Africa, Lesotho, Zimbabwe, Zambia, Malawi and Uganda are

² Kede, S. (2019, July 15). Africa's budding cannabis market. Retrieved from <https://africanbusinessmagazine.com/dPidq>

the exceptions having legalized the cultivation of cannabis for medicinal and research purposes. Their governments are laying the legal and regulatory groundwork for the sale, transport, manufacture, processing and export of a range of marijuana products.

In 2017, Lesotho became the first country in the region to begin legal cultivation of cannabis for medicinal and research purposes and is currently seeing an influx of foreign investment in the industry. In 2018, Zimbabwe became the second African country to legalize cannabis cultivation for research and medicinal purposes after Lesotho with Malawi and Uganda to follow in 2019. South Africa has legalized cannabis cultivation for medicinal use and is the only African country where it's been legalized for private recreational use and though public possession is limited to a maximum of 60 grams, public consumption is illegal.

III. CANNABIS INDUSTRY IN LESOTHO

The Kingdom of Lesotho, warmly referred to as the Mountain Kingdom, is an enclaved country within the borders of South Africa. It is one of only three independent states completely surrounded by the territory of another country. The United Nations Development Program (UNDP) classifies Lesotho as one of the least developed nations in the world with 2.2 million people and almost six in ten of Lesotho's population living below the national poverty line. As a result, many small-scale farmers in Lesotho grow cannabis among their maize crops to export to South Africa and other African countries as a means of survival. In 2008, Lesotho became the first country in Africa to regulate medical cannabis through the introduction of the Drugs of Abuse Act ensuring the availability of certain drugs for medicinal, scientific and related purposes. This law has helped establish the framework for Lesotho's cannabis industry detailing who can prescribe medical cannabis and under what conditions but lacks the detail for creating and sustaining a workable and

inclusive domestic cannabis market. Nevertheless, the framework is sufficient for exports – the primary focus of the industry. The 2008 law sees no distinction between hemp and cannabis, so it does not limit the potential of cannabis or forms that can be exported. Flower and oils are both allowed to be exported, subject to receiving approval for the transaction between the licensed importer and a licensed exporter. Approval must be granted from the health ministry of the importing country. There are opportunities across the value chain as there are currently no suppliers specifically for cannabis companies, including companies which produce general infrastructure such as irrigation equipment, greenhouse, generators, farming equipment, nutrients and cannabis-specific fertilizers.

LICENSES AND COMPLIANCE

Lesotho updated legislation with the 2018 cannabis regulations act. To demonstrate compliance, all license holders were required to provide the following:

- Certified identification documents of all directors together with valid police clearance certificate
- Proof of right on any operating land
- Aerial map of operating site
- Proof of capital adequacy and funds registered in a Lesotho bank account
- Off-take agreement or letter of intent of license's market
- Site plan showing how the site is to be used for licensee's activity
- Floor plan of the premises and facilities where the licensed activities are taking place
- Plans for record keeping
- Security arrangement plan

- Environment impact assessment license

Licenses are valid for one year, renewable annually. All final products must be tested by a certified laboratory before being sold for domestic or export use. The schedule of fees in Lesotho's 2018 cannabis regulations act are listed below in Lesotho Maloti:

SCHEDULE 2 FEES

1	Non- Refundable application fee for all licences	M 15 000
2	Licence fee (sec 11 (2) (b))	
	(a) Licence for cultivation	M 150 000
	(b) Licence for manufacturing	M 150 000
	(c) Licence for testing	M 100 000
	(d) Operator Licence	M 500 000
	(e) Licence for research	M 50 000
	(f) Licence for transportation	M 50 000
	(g) Licence for storage	M 10 000
	(h) Licence for supply	M 50 000
3	Renewal of Licence fee (sec 21)	
	(a) Licence for cultivation	M 100 000
	(b) Licence for manufacturing	M 100 000
	(c) Licence for testing	M 75 000
	(d) Operator Licence	M 350 000
	(e) Licence for research	M 50 000
	(f) Licence for transportation	M 25 000
	(g) Licence for storage	M 7 500
	(h) Licence for supply	M 25 000
4	Permit in relation to Medical and Scientific Programmes and Seed bank	M 5 000
5	Annual inspection fee	M 25 000
6	Change of location fee M 10 000 Plus inspection fee	M 35 000
7	Change of information (Amendment) fee	M 5 000
8	Import, Export, transit and supply (sec 14) 1.5% of the consignment value	

FIGURE 1: FEE SCHEDULE FOR LESOTHO'S CANNABIS LICENSING

Lesotho's government has taken steps to build up the regulatory infrastructure, such as establishing a Lesotho Narcotics Bureau responsible for the issue and renewal of licenses under the Ministry of Health and encouraging some international cannabis businesses to invest in the country's medical cannabis program.

Lesotho became the first African country to grant a license to grow medical cannabis legally mid-2017. There was an initial period where licenses were allocated without charge and with little oversight allegedly to those with government relationships or funds to pay off government officials. Currently, license permits to manufacture, supply, export and transport medical cannabis and cannabis products from Lesotho are ~M500,000 Lesotho Maloti (~\$30,000 USD) which only large businesses can afford leaving small scale farmers to continue operating outside of the legal framework. Small scale growers across the country, who currently sell to the black market, cannot process their cannabis crops and export legally, along with the commercially grown plants as consistency of strains and freedom from pesticides is a necessity for medicinal cannabis. There are Good Manufacturing Practice (GMP) and Good Agricultural Practice (GAP) certifications that are key for medical marijuana companies with international ambitions. GMP is a codified set of rules and regulations that ensure the quality, safety and efficacy of a drug. It covers all aspects of the production process and is audited and certified by regulatory agencies. It is the gold standard of international quality compliance.

The Government of Lesotho has undertaken several policy reforms in recent years to improve the investment climate in Lesotho as the government is cash strapped and eager for new streams of legal revenue. The Land Act of 2010 allows foreign investors to hold land titles so long as the local investors

own at least 20 percent of the enterprise. The following are companies with international investment that have received licenses:

- **MediKingdom Ltd.** – Majority owned by UK founder with local Lesotho partners
- **Medigrow (MG Health)** – 10% acquired by Canadian cannabis company, Supreme Cannabis
- **Verve Dynamics** - roughly 30% ownership by Canadian cannabis company, Aphria
- **Daddy Caan** – 100% acquired by Canopy Growth
- **Pharmaceutical Development Company (PDC) Ltd.** – shares transferred to US-based Corix Bioscience

Medigrow (MG Health) is currently one of the industry leaders exporting to South Africa and Australia and awaiting approval to export to European markets. They are the only company in Lesotho with a CO₂ extraction machine and lead with a documented social impact strategy that invests in the community in which it operates through the implementation of education programs, infrastructure development and entrepreneurial opportunities for employees and community members.

COMPANY PROFILE: MEDIGROW (MG HEALTH) AND SOCIAL IMPACT

Medigrow is a licensed cultivator and manufacturer of pharmaceutical grade cannabis extracts and products. The CEO of Medigrow, Andre Bothma, is a white Lesotho born entrepreneur whose family has been in Lesotho for three generations. He has over 25 years of experience in the construction property development industry as his family owns LSP construction, the leading commercial, electrical, mining and civil contractor in Lesotho. Medigrow has a high-altitude single integrated site; cultivation, extraction, refining and final product production takes place on a single site located in the Lesotho mountains with dry air, clean water and no risk of airborne pesticides

or chemical contamination. The single campus operation allows Medigrow to implement its “plant to patient” philosophy ensuring no risk of outside contamination of their standardized bulk products. Lucan Labs, world leading laboratory, provides analytical results for Medigrow in-process quality assurance program and Certificates of Analysis to verify quality control of products.

FIGURE 2: MEDIGROW'S PRODUCTS

Medigrow Categories	Product	Medigrow Products	Finished	Medigrow Brands
Dried biomass (for GMP flower and oil)		Dropper/tincture bottle		C+BD
Dried flower – GMP certified		Mouth spray		Apex
CO ₂ extracted crude oil		Skin patches		Bulk formulations (Bulk formulations of CBD isolate, full spectrum distillate, dried flower)
Winterized crude oil – GMP certified		Topical creams		Cann9
Distillate oil – GMP certified		Tonics		SNCE - Full spectrum product for UK and EU markets
By products (e.g. wax)		Gel capsules		

To date, Medigrow’s current investment of 370 million Rand (~22 million USD) has allowed for the construction of a 500m² greenhouse (1 Pad=1acre), a 300 L Extraction Vessel with >320 kg per day production capacity, land leased with capacity for 32 Pads (> 12 hectares), 1,750m² GMP ready production building with drying, milling, extraction, distillation, assembly and packaging, a laboratory to test and provide independent certification for the cannabis industry in Lesotho and other countries, and initial brand development (Cann9, C+BD). Medigrow’s plan to scale involves

raising 200 million Lesotho Maloti (~11.8 million USD) for expanding their cultivation area by 10,000 m² building a dedicated cloning and nursery area (better utilization of assets), receiving GAP accredited cultivation and EU GMP accredited production, an upgrade of the water supply to exceed World Health Organization (WHO) standards and increasing working capital requirements as business scales.

The initial seed capital for Medigrow came from an investment consortium called Xantho which includes Medigrow’s COO, Francois Ferreira and founders including Andre Bothma (CEO), a Lesotho citizen. Freebuff 8, a consortium led by a prominent South African investor, provided a combination of equity and an unsecured loan of 20 million Rand. This investment was backed up by the Lesotho Public Officers Pension Fund, who took up a stake in the Company. 5.2% of the shares were allocated to a public investment vehicle, Medigrow Investment Company (MIC). This special purpose vehicle was for qualifying Lesotho investors to get exposure to Medigrow. In early 2018, Supreme Cannabis, a Canadian LP, took a 10% stake in Medigrow and agreed to establish a jointly held trade and distribution venture for the marketing portion of Medigrow’s production. The Medigrow/Supreme Cannabis Joint Venture has the option to market production from the first two hectares and 20% of any additional cultivation capacity. USD 6m was raised at the end of 2018 from a combination of UK and SA family offices.

FIGURE 3: MEDIGROW CAPITAL STRUCTURE

Shareholder Group	% Shares
Promoters and License Holders	41.6%
Founders	4.6%
Friends and Family	2.3%
Freebuff 8	17.3%

PODCPF	6.5%
Active Investors	5.9%
Supreme Cannabis (Canada)	9.6%
Strategic Investors	1.5%
Public Placement (Lesotho)	5.2%
Private Capital Raise	5.4%
Total	100.0%
Lesotho	38.9%
Foreign	61.1%

Medigrow touts that improving the lives of the people of Lesotho is the foundation of their company ethos and culture. Their social impact strategy drives community development initiatives and entrepreneurial opportunities for the surrounding communities of their Marakabei cannabis facility. The Company has initiated an educational program in the local community for existing and prospective employees with an emphasis on English, Mathematics and Problem Solving to better prepare the labor force for potential employment opportunities. Medigrow has provided the surrounding schools with IT infrastructure and hardware and a teaching staff to run a winter tutorial program for local school children to assist with their preparation for final year exams. Medigrow has also initiated a development project to address the accommodation needs for its employees. A village development plan is being designed to allow existing residents to develop rental accommodation facilities for employees outside of the area.

Medigrow's efforts to provide employment and community development opportunities are noble. The learning platforms Medigrow is establishing for the surrounding communities of their cannabis production facility is helping develop Basotho people by presenting options for community members who reside in the mountains and practically isolated from local industries to

educate themselves and their children and become skilled at growing medicinal cannabis to an international standard. But how can cannabis business leaders cast the net and invest more into positioning Basotho people to control the industry and take on a larger equity stake or to become thought leaders in the industry and advance cannabis research for the well-being of those suffering from chronic disease? The CEO of Medigrow, as a Lesotho citizen, international cannabis companies investing in Lesotho's cannabis industry and the Government of Lesotho in establishing the regulatory framework should also be working to institutionalize systems that are preparing Basotho people to fully participate as industry leaders, agripreneurs, and plant scientists. A cannabis curriculum/program integrated into local institutions of higher learning will help streamline some of Lesotho's brightest into the industry to support its growth and promote increased local ownership.

IV. HIGHER EDUCATION AND CANNABIS IN THE UNITED STATES

In the United States, with the advent of the 2018 Farm Bill legalizing the regulated production of hemp, private and federally funded state universities have started offering courses in cannabis across majors as diverse as agriculture, chemistry, economics and journalism. As of 2019, legal cannabis created 211,000 full-time jobs in America.³ The growth of the cannabis industry has inclined American institutions of higher learning to offer courses and full degree programs around the physical science, business and social implications of the plant. The University of Connecticut

³ Barcott, B. (2019, March). Special Report: Cannabis Jobs Count. Retrieved from <https://leafly-cms-production.imgix.net/wp-content/uploads/2019/03/01141121/CANNABIS-JOBS-REPORT-FINAL-2.27.191.pdf>

offers a college course called “Horticulture of Cannabis: From Seed to Harvest”. Students at the University of Connecticut and the University of Denver can also take cannabis journalism classes. Vanderbilt Law School offers a course called “Marijuana Law and Policy”. Cannabis Studies as an undergraduate minor is available at Stockton University, SUNY Morrisville, and Colorado State University. Currently, there are two schools where you can earn a four-year degree in cannabis science: Northern Michigan University in Marquette, MI, and Minot State University in Minot, North Dakota, which both offer bachelor’s degrees in Medicinal Plant Chemistry. Clearly, US colleges and universities have bought into the continued growth of the cannabis industry as the consumer market has grown the economies of States that have legalized.

Cornell University’s College of Agriculture and Life Science’s School of Integrative Plant Science, as New York’s Land Grant University, has assembled an interdisciplinary team of researchers and extension specialists to study how the state can develop its hemp industry by:

- Identifying the best commercially available hemp varieties to grow in New York conditions, and developing new cultivars that will thrive in New York.
- Identifying the best growing practices for hemp in New York, including seeding rates, best soil types, fertilizer rates, weed management, and the optimal time to harvest.
- Identifying possible barriers to this industry’s development, including seed issues, diseases, and insect pests, and providing science-based solutions to these barriers.
- Analyzing and providing information on markets and end-product value, and
- Producing fact sheets, grower manuals, and internet resources.

Cornell introduced a course called “Cannabis: Biology, Society, and Industry” Fall 2019 and will welcome their first cohort for the Master of Professional Studies concentration in Hemp Science

Fall 2020. These are the types of courses and programs that should be designed and made available at tertiary institutions in Lesotho and other African countries where the cannabis market is growing.

V. NATIONAL UNIVERSITY OF LESOTHO (NUL)

The National University of Lesotho has a physical presence in four districts in five campuses. It's a premier institution of higher learning in Lesotho tasked with leading the way to build an ecology of linked higher education institutions, which is critical for innovation and national development. The National University of Lesotho's Associate Professor in the Department of Soil Science and Resource Conservation and Partnerships Manager, Dr. Makoala Marake outlined the following as the primary challenges faced by NUL:

- **Teaching and Learning:** The academic culture at NUL is inefficient, partly due to a curriculum that is not sufficiently broad and flexible to provide a foundation for the student to later follow any specific career path and partly due to a weak commitment to adopting the semester system. Many of the courses and programs taught cry out for modernization to respond to current developmental challenges of the country and region.

- **Scholarship and Research:** Research output by academics deserves significant enhancement. The University has very few postgraduate programs which further adversely bears on its research output. There is a lack of research financial support, infrastructure, including laboratory facilities and equipment and lack of Internet bandwidth required for collaboration across national boundaries and access to global knowledge resources. The academic landscape

at NUL is characterized by the “silo effect”, which reveals itself in very little communication or collaboration among teaching staff across academic boundaries. There is a need to support collaborative initiatives that attract visiting academics.

- **Human Resource Base:** There is a shortage of high caliber staff at NUL. In order for NUL to strengthen its human resource base, it must recognize high achievers and provide incentives, including opportunities for continuing professional development. The human resource base can also be strengthened through partnerships with institutions of higher education throughout the world to effect staff exchange and training.
- **Outreach:** While current outreach efforts by NUL are commendable, there is great scope for more. In this context, NUL should develop and implement a coherent outreach and community engagement policy that will enable it to work closely with its stakeholders, garner public support, increase its visibility

The National University of Lesotho’s aspiration is to be a vibrant African university, nurturing the thought leaders of today. It’s task to build an ecology of linked higher education institutions can be accomplished through global partnerships with colleges, universities and private sector partners. The National University of Lesotho’s Strategic Plan 2015-2020 outlines the University’s strategic goals and objectives and many of them can be bolstered through capacity building initiatives supported by academic partnerships. Dr. Marake has expressed his desire to partner with Cornell University as many values are aligned between the two Universities; specifically, the goal to develop along with the growth of the cannabis industry globally. Dr. Marake also mentioned that the National University of Lesotho has a potential partnership with an Israeli cannabis company who is building a cannabis production facility in Lesotho and interested in outsourcing their cannabis research and development to NUL. With Cornell’s technical resources and programs

conducting plant science research of different hemp varieties, establishing this academic partnership will help build NUL's capacity to conduct cannabis research making them more attractive to other cannabis companies establishing themselves as players in the industry.

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FACULTY OF AGRICULTURE

February 12th 2020

Dr. Max Pfeffer
Executive Dean
College of Agriculture and Life Sciences
Cornell University
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Ithaca, NY 14853-5905

Dear Executive Dean Pfeffer,

As stated in our Strategic Plan 2015-2020, the mission of the National University of Lesotho (NUL) is to advance human development and to respond to national and regional needs through knowledge creation, dissemination and community engagement, employing technologically innovative strategies.

Recognizing the value of local and international partnerships, NUL is affiliated with other institutions of higher learning around the world, which we believe is critical for innovation and national development. As the premier academic institution in Lesotho, we seek to create a learning environment that nurtures thought leadership across disciplines anticipating and responding to community needs as new industries emerge. Our leadership is committed to providing services that improve the quality of learning by broadening our curriculum, increasing communication and collaboration among teaching staff across academic boundaries and boosting support for multidisciplinary and interdisciplinary research and programmes.

Given increased investment in emerging agricultural industries in Lesotho, there is an even greater demand for human capital with strong agricultural expertise. The National University of Lesotho is committed to supporting the growth of these industries through increased research and agribusiness leadership. We would like to congratulate Cornell University on the establishment of their new Global Development unit under the College of Agriculture and Life Sciences (CALs). NUL is aware of the legacy of Cornell University and the leadership efforts taken to advance plant science research and create platforms to better prepare students to participate in agricultural industries domestically and internationally.

The National University of Lesotho welcomes opportunities for academic partnership with Cornell University in the form of programmes that reflect our shared commitment to develop leadership and address global problems. Platforms for cross-cultural and knowledge exchange will help students and faculty interpret and address some of these global challenges through collaborative and inclusive processes.

We look forward to your positive response as we work to strengthen our international partnerships and continue to expand our educational reach.

Yours Sincerely,



PROF. P. M. DAWUDA
DEAN FACULTY OF AGRICULTURE

FIGURE 4: NUL'S OFFICIAL REQUEST FOR PARTNERSHIP WITH CORNELL UNIVERSITY

VI. PARTNERSHIP RECOMMENDATIONS FOR INSTITUTIONAL CAPACITY BUILDING

International Programs under Cornell University's College of Agriculture and Life Sciences (IP-CALS) has a number of capacity building initiatives with institutions of higher education across Africa.

Uganda - Cornell University and Makerere University has an educational project called GREAT (Gender-responsive Researchers Equipped for Agricultural Transformation). With GREAT, researchers who work in sub-Saharan Africa (SSA) learn how to identify the needs of women and men when setting agricultural project priorities, implementing projects, and measuring and communicating outcomes. Led by Hale Ann Tufan, adjunct professor with International Programs in Cornell's College of Agriculture and Life Sciences, GREAT's goal is for agricultural

researchers working across sub-Saharan Africa to improve the livelihoods of smallholder farmers by considering gender and prioritizing gender equality goals in their work. By 2020, GREAT expects to have trained eight cohorts with up to 10 research project teams each, or more than 200 researchers representing at least 30 national and international research institutions in SSA.

Egypt – Cornell University and Cairo University are partnering on a USAID-funded five-year collaborative project aimed at training and equipping the faculty and next generation of Egyptian students to improve agricultural production in the North African country. Cornell, as the lead implementer, will support the development of a Center for Excellence in Agriculture in Cairo University’s Faculty of Agriculture (COEA-CUFA) that leverages the strengths of Cairo University; four leading colleges of agriculture in the United States (Cornell, Purdue University, Michigan State University, the University of California, Davis); Sathguru Management Consultants; partner Egyptian universities; the Egyptian government; and agribusiness leaders. The initiative will lead to joint research projects that will deepen relationships between American and Egyptian universities and build up for future scientific collaboration that will link the two countries.

Cornell has a number of existing programs that can be leveraged in order to provide increased support to the National University of Lesotho’s institutional framework.

Student Multidisciplinary Applied Research Teams (SMART) Emerging Markets Program

- a unique service-learning program of the emerging markets program. SMART brings together teams of both graduate and undergraduate students, faculty, and staff from across the university and pairs them with small companies, organizations, and community groups located in developing countries and emerging economies. SMART teams work to address a specific need identified by

their international partner. Students work on well-defined assignments challenging them to apply classroom knowledge and skills in real world international development settings. students contribute technical assistance and analytical support, present their research and analyses, and then return to Cornell to develop publishable case studies and other materials to enrich learning in university classrooms and executive education programs.

CALS Global Fellows Program - supports CALS undergraduate students from any major in pursuit of challenging, professionally focused summer internships and research placements that enhance and complement their career goals and academic progress, while enriching their undergraduate experience with diverse cultural and international immersion. Through key partnerships, the Global Fellows Program provides a platform for students to make positive and definable contributions to global organizations and communities.

These are two programs at Cornell that can be leveraged to strengthen the relationship between the National University of Lesotho and Cornell University. In partnership with cannabis companies in Lesotho, students can travel to Lesotho and research some of the business, regulatory, and operational challenges faced by Lesotho's growing cannabis industry, make recommendations and facilitate platforms for NUL to engage with local companies to discuss areas of collaboration specifically around cannabis research and development. In addition, Cornell could establish a memorandum of understanding with NUL and provide professional development opportunities to NUL staff by allowing access to online resources (i.e. seminars, journals, etc.) to promote engagement and strengthen local capacity. This is a mutually beneficial relationship as it further solidifies Cornell's efforts in establishing itself as a leading thought leader in cannabis in the

United States and abroad and addresses some of the challenges NUL is facing around outreach, human resources, scholarship/research and teaching/learning.

These recommended programs should be funded by local cannabis companies and the international cannabis companies investing locally. Updates should be made to the 2018 cannabis regulation act to include an R&D tax that would amount to a percentage of local cannabis companies' annual revenues to support local partner tertiary institutions in advancing cannabis research and education platforms. If Lesotho wants for its local cannabis industry to rapidly grow and maintain local control, it must invest in the education of the people. The funding can be used to establish a course or full program for students around cannabis at the tertiary level or similar to Cornell's SIPS Extension and Outreach program, train professors and assemble a team of researchers and extension specialists to help advance the industry, mobilize and educate community members. Whether or not local cannabis companies have an R&D budget, all should be mandated to invest a percentage of their profits in support of local workforce development as it's the same pool in which they're recruiting employees to sustain operational excellence.

RUFORUM

As the cannabis industry across Africa flourishes, the process of developing a cannabis curriculum is crucial as the demand for workers with a broad range of skills, from accounting and logistics to farming and production increases. In establishing a curriculum for cannabis to be rolled out at college and universities in African countries that have legalized cannabis cultivation for medicinal and research purposes, it will be important to engage RUFORUM, the Regional Universities Forum for Capacity Building in Agriculture. RUFORUM, established by ten Vice Chancellors in 2004, is a consortium of 126 African universities operating within 38 countries spanning the

African continent. RUFORUM is coordinated by a Secretariat hosted by Makerere University in Kampala, Uganda and supports universities to address the important role that universities play in contributing to the well-being of small-scale farmers and economic development of countries throughout the sub-Saharan Africa region. RUFORUM exists to:

- Realize economies of scope and scale through academic exchanges including fostering region centers of excellence to train the next generation of agricultural scientists
- Provide an effective platform for University support to smallholder farmers through linkages with national agricultural research systems, the private sector and rural communities
- To champion national and regional policies to support effective postgraduate agricultural training and research

RUFORUM signed a cooperation agreement with the African Union to support the implementation of the new African Union for Science, Technology and Innovation Strategy for Africa, 2024 (STISA 2024). It is owned and managed by Africans and derives its agenda largely from the continent-wide policy frameworks and constant review of global trends and foresight planning to ensure Africa has the required capacity for global competitiveness.

November 2020, RUFORUM will hold their Annual General Meeting (AGM) in Marrakech and Ben Guerir, Morocco at the Mohammed VI Polytechnic University a year prior to the Triennial conference to be held in November 2021 in the Republic of Benin. The 2020 AGM will be held under the theme ‘Higher Education- Private Sector Partnership: Harnessing Opportunities for Agricultural Transformation in Africa’. The 2020 AGM in Morocco is structured to tap into resources and technical expertise from policy makers, the private sector, development agencies and regional bodies that focus on agricultural transformation and the contribution of higher

education. This would be the perfect opportunity to introduce the idea of higher education and private sector supporting the growth of the cannabis industry in Africa given the legalization of cannabis cultivation across Southern and Eastern Africa. This platform sets the stage for a dialogue between academic leadership, policy makers and the business leaders of Africa around higher education's role in the cannabis industry's human resource development and the government's role in enacting policies mandating private sector support of capacity development programs for the cannabis industry.

VII. CONCLUSION

The value proposition for international cannabis companies investing in Lesotho as a production hub for hemp and medicinal marijuana is Lesotho's rich, high-altitude soil with an abundant water source, low cost of labor, and potential of the South African consumer market with the country's first cannabis oil dispensary launched May 2018. Lesotho continues its efforts to unlock the potential of their cannabis market by laying the legal and regulatory groundwork for the sale, transport, manufacture, processing and export of a range of marijuana products, but the regulation on production, legislation and exporting to key international markets remains inadequate. Lesotho's Ministry of Health still lacks the capacity to distribute licenses for cannabis cultivation and maintains poor governance structures which harbors a culture of corruption. Nevertheless, several large US and Canadian firms have already established a commercial footprint in the local cannabis industry as the government of Lesotho actively encourages foreign direct investment in all areas of the economy and imposes limited restrictions on foreign ownership of small businesses as foreign investors benefit from the same rights and protections as Basotho investors. As the first African country to legalize the cultivation of cannabis for medicinal, research purposes, and

export; establishing education platforms at the University and community level will ensure Lesotho's rise as a hub of cannabis knowledge, resources, production and trained hands on skills for the African continent. The government of Lesotho traditionally invests the largest share of its budget in education. In 2019-2020, a sum of 3.1 billion Lesotho Maloti, representing 17 percent of the total budget was allocated to education and training.⁴ Unfortunately, despite increased investment, Lesotho's education system has a number of challenges. Basic primary education is free, but fees are required for lower and upper secondary school. The completion rate for lower secondary is ~47%⁵; one reason for the low completion rate being that many families cannot pay their children's school fees. This is also why it's important to empower University students and academics to provide extension services that also educate the wider community and better position them for opportunities in the cannabis industry potentially through certified vocational programs. Lesotho is a beautiful country that has a great opportunity to become a production hub for cannabis globally. Investment in education platforms, at the community and university level, are imperative to ensure Basotho people have opportunities to participate in its budding cannabis industry at every level.

⁴ Education & Training. (n.d.). Retrieved from <https://www.lesothoreview.com/contents/education-training/>

⁵ Lesotho - Lower secondary completion rate, total (% of relevant age group). (n.d.). Retrieved from <https://www.indexmundi.com/facts/lesotho/indicator/SE.SEC.CMPT.LO.ZS>

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