



# 2018 Annual Report



## Sena Institute of Technology

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*Community and Regional Development Program*  
*Department of Human Ecology*  
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## **EXECUTIVE SUMMARY**

This is the annual report for Sena Institute of Technology from January 2018 to December 2018. Last year, the institute embarked on an ambitious project to complete its infrastructure capacity. SIT has dedicated its initial efforts on infrastructure development through the construction and completion of its headquarters that houses laboratory spaces, library, administrative office and an art exhibition center. However, the Institute is yet to complete the second phase of improving security in and around the facility.

This year we are on an equally important mission to start work on the Institute's research goals. For a start, SIT laboratories are adding value to agricultural products, developing laboratory grade materials from agricultural products and cataloging existing tropical medicines for curtailing tropical diseases and tracking emerging disease outbreaks. During the process SIT will develop resources that will enable us to perform excellent biomedical and microbiological research and to grow into an independent Institute.

To successfully execute these projects, the President of the Institute visited Ghana to familiarize himself with projects being undertaken and met with the staff. In the first quarter of 2018, the President together with SIT staff had focused group discussions with local and state leaders to discuss major issues affecting the country, discuss solutions to these issues. The group also strategizes on planning research projects to make the communities self-sustaining.

Next we embarked on creating major projects including building an electronic plant database in Ghana, making media from agricultural waste and setting a fab lab to train staff on 3D printing and design. To initiate capacity building for placed based organizations we are involved in numerous workshops and seminars. The president presented work at SIT at the Earthos Institute Conference in June 2018. We are partnering with them to organize monthly seminars in Boston.

Finally, our president and founder was featured on the Personal Genetics Education website for his role in developing research in Ghana and the future of SIT as a global organization.

In conclusion, we launched our first fundraising campaign for SIT in December. Your contribution and support will enable us to grow into a global organization.

Yours truly,

Kwasi Agbleke, Ph.D.  
President, Sena Institute of Technology  
President and Director, Sena Institute of Technology Foundation

# MAJOR ACTIVITIES

## Post Office Box for the Institute

The Institute has opened a post office box in Ghana for easy correspondence. The address of the Institute is Sena Institute of Technology, P.O. Box DZ110, Dzodze, Volta Region.

## President's visit to Ghana

From January 14 – February 13 2018, the President visited Ghana to meet with staff and start work on our projects. He and the staff also held focus group meetings with local and national stakeholders to discuss future projects and collaborations and share ideas on how the Institute can benefit the communities within which it operate.

- ***Chiefs and Elders:***

Community leaders have been an integral part of Ghanaian culture. Staff from the Institute met with 12 chiefs and elders drawn from the various communities in the district. The staff heard and noted the current community problems, presented the Institute's vision and received valuable inputs. The chiefs were happy with SIT initiative and were ready to rally the townships to support the initiative.



- ***District Health Directorate:***

Through meetings with the district health directorate SIT staff found out that the directorate was interested in how SIT projects could augment the community's health. The directorate expressed enthusiasm in partnering with SIT on disease surveillance and on other research projects aligning with their interests. The directorate was also happy to write introductory letters for SIT to grant access to the hospitals and clinics in the district.



- ***Tertiary institutions:***

Finally, the president and staff met with lecturers from the University of Ghana, Accra particularly in the Biochemistry department. Many of them were interested in the Institute's approach and willing to partner with SIT. The faculty were interested in our student internship program. The president proposed to contact them once the program structure was in place. The president also met the staff from Medical Biochemistry at the University for Development Studies (UDS) in the Northern Region. The faculty were also interested in partnering and student exchange.

- ***Dzodze-Penyi Senior High School:***

SIT staff met the headmaster and staff of the Dzodze-Penyi High School. The meeting discussed Sena Institute of Technology and the opportunities that it can provide to the teachers and students. SIT offered to present an avenue for internships for



students to get extra laboratory experience and provide an avenue for teachers to conduct research within its facilities. A couple of collaborative projects were proposed. This aligns with the Institute's aim of training professionals.

- **District Education Unit:**

The education unit is willing to give introduction letters to SIT staff so that the staff can interact with students in the district, organize workshops and training for the students and teachers. The unit is ready to support SIT in any way possible.



- **Ministry of Chieftaincy and Religious Affairs:**

The president had a lengthy discussion with the minister for Chieftaincy and Religious Affairs, Mr. Kofi Dzamesi, who hails from the district. The minister was happy with the Institute initiatives and was willing to help. In addition, he expressed interest in the Institute creating a database of chiefs in the country. This documentation exists on paper and was interested in transferring this to a digital database. He also referred me to the Minister for Science, Technology and Innovation. He thought the Institute could get more assistance and partnership from the Minister for Environment, Science, Technology and Innovation as well.

- **Minister for Environment, Science, Technology and Innovation:**

The minister, Prof. Frimpong Boateng, received the President and was quite interested in the project. He was enthused with the Institute's concept of starting from the countryside and the potential to develop rural part of the country. He appreciated the Institute's ideas of broadening local knowledge by adding value to our agricultural produce. He was particularly interested in our proposal to study local medicinal plants to catalog possible drug agents for prevalent tropical diseases.

- **Conclusions from Ghana trip:**

In conclusion, the trip was fruitful. It also showed that frequent visits and meetings would help build momentum for the institute.

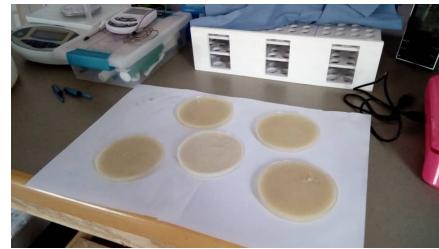
# PROJECTS

- **Laboratory Projects:**

Major projects being undertaken by our laboratories include:

1. Developing laboratory grade and industrial reagents from agricultural products. These will be used for microbiology experiments.
2. Characterization of yeast extracted from natural fermentation processes.
3. Collection of public health data and outcomes to assess health risks in the district and as well as track emerging diseases.
4. Extraction of active ingredients from medicinal plants for mass production. This will serve as a repertoire of possible drugs for research and development especially with respect to tropical medicine

The purpose is to produce reagents locally to facilitate future projects, make the lab independent and serve as a beacon of R&D in the region. The lab has successfully produced agar (culture media) from farm produce. In addition the lab is working on ethanol extraction for use within the lab. Finally, the lab has started characterizing yeast extracted from local sources. Preliminary analysis suggests that these yeast strains are highly resistant to acidic environments.



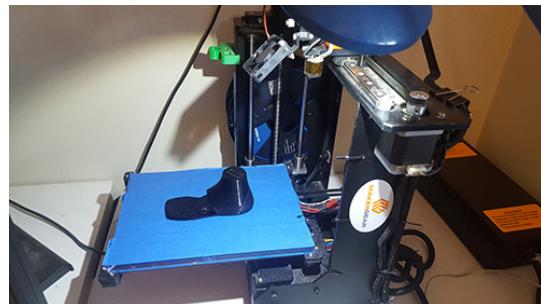
- **SIT launches first digital Herbarium in Peny**

In this global era, it is disheartening that farmers substitute local crops with foreign crops that have been well characterized. It is our goal to reverse the trend by creating an electronic database of local food and medicinal crops as we strive to ensure food security. We work with farmers through workshops and focus group discussions on sustainable farming practices as well as better characterization of local crops and plants.

Register	Local name	Common name	Family name	Genus	Species	Function	Medicinal	Bloom Histo	Growth for	Crown	Roots	Stem	Photos
SH-001	Ademe	Jew's mallow	Malvaceae	Corchorus	Olivorus	Food	<input checked="" type="checkbox"/>	Annual Plant	Herb	9 cm	11cm, Taproot	64 cm, Erect stem	<a href="#">e_Herb image</a>
SH-002	Tea Gbe	Lemon grass	Poaceae	Cymbopogon	Spp	Food	<input checked="" type="checkbox"/>	Perennial Plan	Grass	168 cm	2.5 cm, Fibrous roots	4 cm Erect stem	<a href="#">e_Herb image</a>
SH-003	Agbelli	Cassava	Euphorbiaceae	Manihot	Esculenta	Food	<input type="checkbox"/>	Perennial Plan	Shrub	62 cm	Specialized Taproots	220 cm, Erect stem	<a href="#">e_Herb image</a>
SH-004	Amah	Dandelion	Asteraceae	Launaea	Taraxacifolia	Food	<input checked="" type="checkbox"/>	Annual Plant	Herb	23.5 cm	10cm Taproot	95cm, Erect stem	<a href="#">e_Herb image</a>
SH-005	Yewu Gboma	Water leaf	Talinaceae	Talinum	Triangulare	Food	<input type="checkbox"/>	Annual Plant	Herb	31 cm	22 cm Taproot	23 cm, Erect stem	<a href="#">e_Herb image</a>
SH-006	Ator Tsli					Food	<input type="checkbox"/>	Perennial Plan	Tree	59 cm	Taproot	130 cm erect	<a href="#">e_Herb image</a>
SH-007	Kontomire	Cocoyam	Araceae	Colocasia	Esculenta	Food	<input type="checkbox"/>	Perennial Plan	Shrub	58 cm	Specialized root	specialized stem/Corm	<a href="#">e_Herb image</a>
SH-008	N/A	Spanish needles	Asteraceae	Bidens	Pilosus	weed	<input checked="" type="checkbox"/>	Annual Plant	Herb	21.5 cm	6 cm, Taproot	46cm, Green erect stem	<a href="#">e_Herb image</a>
SH-009	N/A	Horse Purseland	Aizoaceae	Trianthemum	Portulacastrum	weed	<input type="checkbox"/>	Annual Plant	Herb	36 cm	7.3cm, Taproot	Forms a prostate mat st	<a href="#">e_Herb image</a>
SH-010	N/A	Green Kyllinga	Cyperaceae	Kyllinga	Brevifolia	weed	<input type="checkbox"/>	Perennial Plan	Grass	7 cm	5.5cm, fibrous roots	3 cm, Erect stem	<a href="#">e_Herb image</a>
SH-011	N/A	Tropical Spiderwort	Commelinaceae	Commelinia	Forskaolia Vahl	weed	<input type="checkbox"/>	Annual Plant	Herb	36 cm	Specialized root/ Rhizone: Several recumbent ster	<a href="#">e_Herb image</a>	

- **SIT launches Fab lab**

In April 2018, Dr. Agbleke together with Mr. Jordan Pelowitz, a 3D design and printing expert initiated a fabrication lab to make 3D printed parts for leg prosthetics. The project has been ongoing and we have tested several prototypes for foots, joints and sockets. A prosthetic foot we developed and printed is shown on the right.



# **EDUCATION**

## **Seminars**

In June 2018, Dr. Agbleke was invited to speak at the Earthos Institute Conference where he presented work undertaken at SIT. Late in the year he is partnering with Earthos Institute and Art Centar Gracanica to organized monthly seminars in Boston on building placed-based resiliency in 2019. These seminars will focus on how to build and grow international organizations. This collaboration is already in place with line-up seminars scheduled for 2019.

## **News about SIT**

The Harvard Personal Genetics Education featured SIT president, Dr. Agbleke on their website. Dr. Abed interviewed Dr. Agbleke on the motivation leading to SIT and his vision for the future. To read more about the post check out: <http://pged.org/scientist-profile-dr-kwasi-agbleke/>

## **Workshops**

Finally, the event planning team has been formed to organize short monthly workshops in the Institute. The goal is to provide valuable resources to staff, high school and university students. We will also have in-house training for our staff. At this moment, we have two staff training in the laboratory.

1. Laboratory safety training in the laboratory.
2. Standard operation procedure in the laboratory.
3. A standing offer from trainers in Boston to visit and train staff in Ghana in 3D modeling and rendering. These skills can aid in creating animated representation of our research projects for visualization.
4. Dr. Ara Tahmassian, Director of Research Compliance, Harvard University, will train SIT staff in research administration in 2019. Positions to train include Grant Officer, Ethics Officer, Research and Safety Officer, HR and internal control and Data and Technology officer.

## **Webinars**

The SIT board decided to organize short seminars and webinars for professionals, graduate students, postdocs and faculties from within and outside the country to present their work to other researchers in Ghana and beyond. The webinars will focus on recent technologies, description of current project or major findings. We are ready to make short videos of specific research methods and share it with our team and beyond. Currently, two webinars are scheduled for the coming months in 2019.

1. A Massachusetts geneticist and farmer, Mohammed Hannan, is willing to train staff and farmers on agricultural methods, business and resources for scaling and document farming costs.
2. Secondly, Jordan Pelowitz will begin training staff through Zoom in 2019. This is to train staff on 3D design and modeling prior to training on 3D printing. The online classes will prepare students for his arrival in site.

## **Conference in Ghana**

Last year, the institute was unable to organize its maiden conference as scheduled. As a team, we have learnt valuable insight into the complexities in organizing research conferences within the country. We are ready to reorganize the conference in future. By resolving the challenges faced by this year's organization, we hope to build robust registration system to enable the realization of the conference.

# FUNDRAISING AND SUPPORT

## Tax-exemption application

We started the process of filing for 501c3 tax-exemption for SIT Foundation. In 2019, the USA IRS approved SIT Foundation (EIN # 83-3023837) as a federally recognized tax-exempt organization under the Internal Revenue Code (IRC) section 501(c)(3).

## Donations

SIT received laboratory donation from Rutgers University. We received items including lab wares, centrifuges, a liquid nitrogen tank, an ultralow freezer, water baths and incubators. All items have been shipped to the institute in Ghana.

## Fundraising

In December we started our first fundraising campaign to raise \$50,000.00 to fund our research projects. The money will mainly pay salaries for our dedicated research staff; buy more testing equipment; and support daily running of the institute. Possible sources of funding are not limited to the following:

- Individual donors
- Online platforms
- Grants from national and private foundations
- Biotech corporations

The purpose of the [\*\*2019 Fundraising Campaign: "Together, we build"\*\*](#) is to:

- Raise funds to expand and equip our existing facilities in Ghana and USA.
  - Support our library and provide training and capacity building programs.
  - Collect local arts, restore and exhibit them within our institute.
  - Execute our research programs in the various departments.
  - Share our discoveries through publications, seminars and conferencing.
  - Complete the 3D printing and fab lab center and equip the center to train students.
  - Construct our new research building on our new site.
- **Educational Goals**
1. Promote science and technology awareness in the communities we operate.
  2. Encourage high school students to take up science at an early age.
  3. Create hands-on internship programs for undergraduates.
  4. Promote women in biological science careers.

More information on the fundraising: <https://sitghana.org/2019-fundraising-campaign/>

## **SENA INSTITUTE OF TECHNOLOGY IN PICTURES**



A demonstration on microbiology



Getting ready up for work



Testing pH of a fermentation media



Team Discussion of a project



Team brainstorming session

## ACKNOWLEDGEMENT

### CHIEFS AND ELDERS

<b>Torgbui Ekle II</b>	Hattah
<b>Torgbui Axorlu II</b>	Atsiagorme
<b>Mama Axorlu II</b>	Atsiagorme
<b>Torgbui Saladzetu IV</b>	Yorkoe
<b>Torgbui Ahiati II (Regent)</b>	Tagbanu
<b>Rocky Kwaku Vedu</b>	Linguist
<b>Daniel Zilevu</b>	Assemblyman
<b>Agbodzinshi Fiadowu</b>	Opinion Leader
<b>Ahiaku Raphael</b>	Opinion Leader
<b>Kwadzotse Bete</b>	Opinion Leader
<b>Solete Vedu</b>	Opinion Leader
<b>E. K. Hamenoo</b>	Coordinator

### INSTITUTIONS

- Pro. Frimpong Boateng**, Minister of Environment, Science, Technology and Innovation  
**Hon. Kofi Dzamesi**, Minister of Chieftaincy and Religious Affairs  
**Mr. Eli**, District Coordinating Director  
**Doris Quame**, Ag. Health Director  
**Genevieve Ahadzi**, Community Mental Health Officer  
**Victor Zeng**, District Health Info. Officer  
**Joyce Wuver**, Nutrition Officer  
**Christopher Kankpetrige**, District Disease Control Officer  
**Elizabeth Atilusey**, District Administration Manager  
**M. E. Ashiagbor**, District Education Director  
**Mr. Kaledzi**, Assistant headmaster, Dzodze Penyi Secondary School Staff  
University of Ghana, Legon
  - **Dr. Winfred Dorleku**
  - **Dr. Seth Gbewonyo**
  - **Dr. Patrick Arthur**University for Development Studies
  - **Dr. Dzigbodi Doke**
  - **Dr. Gideon Helegbe**