

## African Prime Institute of Science and Technology (A.P.I.S.T)

"Science and Conscience"

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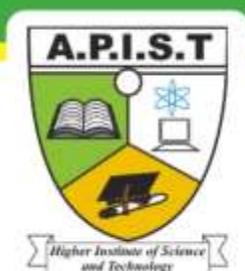
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## *APIST ADVISORY COUNCIL OF SCIENCE AND INDUSTRY (AACSI)*

### *I. MISSION*

The Mission of *AACSI* is to participate in and contribute to the scientific/industrial advance of African Prime Institute of Science and Technology by:

- Supporting the mission, vision, goals and values of the College,
- Offering its expertise to help ensure the health and success of the College,
- Contributing significantly to fundraising and program activities,
- Working to communicate the College's role to its most important audiences,
- Continually communicating with APIST staff to ensure they understand all current affairs, and
- Helping the College to produce inventive, visionary, skilled, proactive, and hardworking people susceptible of transforming the lives of all their counterparts in their local communities.



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## *II. RESEARCH FIELDS*

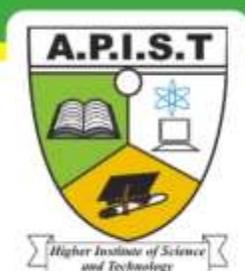
### *A. AGRICULTURAL SECTOR*

#### *1. AACSI Spectrum Centre*

AACSI Spectrum Centre is one of the major Agriculture Technology Demonstration Centres that APIST plans to adopt for a sustainable development in Eswatini. The Centre aims at excellence in technology transfer from AACSI to farmers. Five areas will make its focus: Mushroom Growing, Maize Cultivation, Water and Soil Conservation, Small-scale Machinery and Sericulture. Given these areas, more emphasis will be put on research, demonstrations and training. Eswatini farmers will be the main beneficiaries of all the agricultural technologies to be displayed by the Centre. As economic development is a process of continuous technological innovation and structural transformation, there will be a need to set up a sustainable management of the Centre with a clear Strategic Plan. In this regards, a *SWOT* analysis will be conducted to get orientations.

The ultimate objectives of the Centre will be the capacity building of the farmers and other stakeholders through value chain and entrepreneurship development. Five strategic goals will constitute the heart of the document:

- Increasing competitiveness of mushroom production for nutrition and income generation through capacity building and technical support;
- Increasing maize productivity through participatory demonstration of improved technologies;
- Demonstrating integrated natural resource management for sustainable agriculture



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production through soil and water conservation;

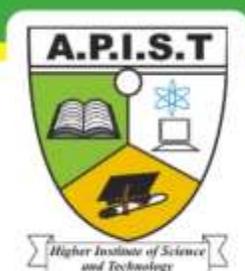
- Enhancing efficiency of farming and post-harvest handling through promotion of small scale mechanization and
- Strengthening sericulture industry.

Each strategic goal will correspond to each program and will have priority actions with a list of activities, objectives, indicators and calendar. Activities will be budgeted for the period of the Strategic Plan. The staff repartition will be set up in such a way that the International experts shall work hand in hand with the Eswatini staff for efficient knowledge exchange & effective collaboration, scientific mentoring in research and extension service delivery towards success and sustainability of the Spectrum Centre's activities. A monitoring and evaluation strategy will also be put in place to ensure that the objectives are met in the set period. This Centre will be a bridge for agriculture technology transfer from International Experts to Eswatini local farmers.

### ***2. Fruit Tissue Culture (FTC)***

Eswatini Vision laid out key policy issues that need urgent attention to bring about transformation of the agricultural sector from a traditional peasant based subsistence farming to a fully monetized commercial agriculture that will increase productivity and achieve growth rates as follows:

- Extensive research and extension services,
- Investment in rural infrastructure,
- Use of high yielding varieties and intensive input use,



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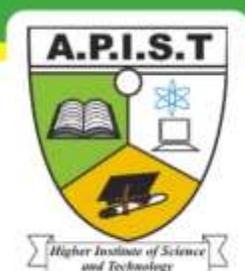
- Promotion of agro-based manufacturing,
- Environmental measures to halt the decline in soil fertility, and
- Rural financing schemes & markets.

Apparent in the above strategies is a genuine attempt by Eswatini Government to correct the problems and inadequacies throughout the whole agricultural value chain from land tenure systems to the financing of agricultural activities & investments, the development of functional markets and the processing of agricultural produce.

However, despite the best intentions of the government to intensify and commercialize agricultural production through the increased use of yield enhancing inputs such as fertilizers and pesticides, limited progress has so far been made in this regard.

### *a. The causes and effects of the problem/ issue*

Fruit cultivars exist under local names and often within limited distribution. Land pressure, pests, diseases and plant nutritional problems have caused certain fruit cultivars rare or completely disappeared. The objectives of this project for AACSI is therefore to first establish the current Fruit diversity and its distribution in Eswatini; secondly to understand the possible factors affecting Fruit distribution within the area; and thirdly to work out synonyms homonyms among the cultivars while at the same time producing high quality Fruit seedlings through AACSI Tissue Culture Laboratory, which action will lead to high production and then contribute to food security.



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### ***b. Strategy***

To close the yield gap between potentially attainable Fruit yield and what the farmers are currently obtaining and move Eswatini smallholder farmers towards the maximum potential yield, AACSI (in partnership with the program of Agriculture at APIST) will propose a five year program targeted in the regions that will be designated Fruit Producing Areas, involving demonstrations, field days and farmer field schools on Fruit Tissue Culture application, choice of Fruit varieties, Fruit agronomic practices that optimize Fruit yield plant populations, planting patterns, disease and pest control and the use of Fruit Tissue Culture nurseries by farmer groups.

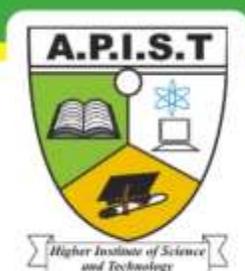
AACSI will use Biotechnology research which aims at contributing to the national capacity in responding to the considerable demand in the country. AACSI staff will make aware the project and sensitize its benefits to the farmers to increase the acquisition of quality seedlings. The availability and use of high quality, improved planting material, tolerance of environmental stresses, will be the key to improved agricultural productivity during this Project.

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## ***B. HEALTH SECTOR***

### ***1. Disease Tracking & Epidemiology***

AACSI researchers will study the incidence of disease in large communities. Using clues about the patterns in which deaths and diseases occur, the Centre will be able to identify emerging disease patterns that may indicate environmental health hazards, potential outbreaks of existing diseases, or emergence of new infectious diseases.



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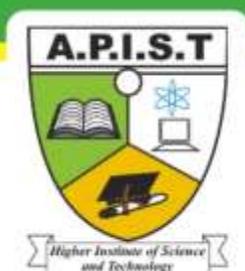
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As threats to public health concerns change over time, *AACSI* researchers will continuously evaluate epidemiological trends to determine how best to meet future public health needs in Manzini. For example, recent reports show that infectious diseases believed to be under control many years ago, are now responsible for more deaths worldwide than any other diseases. This resurgence is probably due to new drug-resistant strains of the bacteria that cause them. These pandemics have been declared global public health emergencies, prompting intensive international public health efforts to curb their spread.

The Research Centre will attempt to break the chain of disease transmission by notifying people who may be at risk for contracting an infectious disease. When for example *AACSI* researchers learn that a restaurant worker has infectious Covid 19 or Hepatitis, they will place announcements in local media such as radio and newspapers, urging people who ate at the restaurant in recent weeks to be checked for the disease and to seek treatment so that they will no longer risk infecting others. Such an alert will trigger public health officials all over the area or across the country to establish measures and procedures to identify and isolate the cases and possibly prevent the illness from reaching epidemic proportions.

### ***2. Sanitation and Pollution Control***

As disease-causing organisms are often transmitted through contaminated drinking water, the Centre will ensure that drinking water is clean and not contaminated by sewage in order to effectively limit water-borne diseases. For this purpose, it will train people on establishing sewage disposal and solid waste disposal systems, and regularly test water supplies to ensure they are safe.



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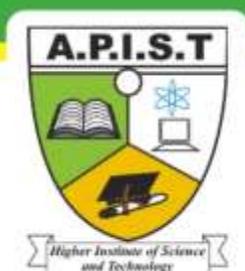
As environmental pollution is another preventable cause of disease and disability, The Centre will address the adverse health effects of air pollution and water pollution. It will work in conjunction with pollution control organizations to establish and enforce pollution limits and advise the general population when pollution levels exceed safe limits. For example, when air pollution reaches harmful levels in Manzini, AACSI and environmental officials will warn the public of the potential dangers. When chemical contamination renders ponds or rivers unsafe for swimming, the Centre will post warning signs informing the public of the hazard. It will advise the authorities on closing down businesses that consistently put harmful pollutants into the environment, or prohibiting the distribution and sale of food harvested from contaminated regions.

### ***3. Medical Research***

AACSI's scientists will work in a laboratory to establish new ways to prevent, diagnose, treat, and cure diseases and disability in Eswatini. Other projects will investigate the safety and effectiveness of existing pharmaceuticals and treatment programs, and test the safety of hundreds of the products that are used every day, such as new food products, household cleaners, and nonpolluting forms of gasoline.

### ***4. Public Education Campaigns***

Many diseases are preventable through healthy living, and AACSI's primary goal here will be to educate the general public about how to prevent noninfectious diseases. In the Centre's public health campaigns, it will teach people about the value of avoiding smoking, getting treatment for



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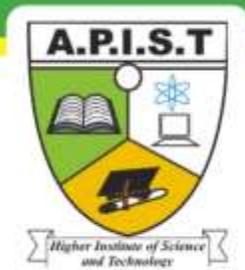
high blood pressure, avoiding foods that are high in cholesterol and fat, and maintaining a healthy body weight. Other campaigns will educate the public on ways to prevent birth defects, such as abstaining from alcohol during pregnancy to prevent fetal alcohol syndrome.

Still on its public health education or health promotion, the Clinic will place special emphasis on illnesses and disabilities that decrease the quality of life. For example, such promotion efforts could increase the public awareness of osteoporosis, a condition that causes disabling bone fractures among older women. These programs will educate women about how to maintain strong bones by including enough calcium in their diets, exercising, and to consider estrogen replacement therapy after menopause. AACSI Health Promotion will also encourage people to take advantage of early diagnostic tests that can make the outcome of a disease more favorable. The Centre's regular mammograms will encourage early detection of breast cancer, for instance, increasing the chances of a cure. Its detection and proper treatment of high blood pressure will reduce the risk of a stroke, the leading cause of permanent disability in older people.

Accidents, particularly automobile accidents, pose a major threat to public health, and AACSI will undertake campaigns to reduce the number of automobile accidents by discouraging drinking and driving. Violence, especially domestic violence, is actually a public health problem and the Centre will sponsor family violence prevention programs.

### ***5. Therapy***

As a final stage in the treatment of physical and mental illnesses, AACSI will have recourse to rehabilitation. This may include physical therapy which involves exercise, massage, and the application of heat and water (hydrotherapy) to improve or restore functioning to damaged and weakened parts of the body.



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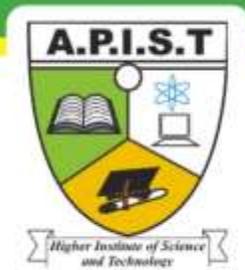
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People with disabilities will also benefit from AACSI recreational and occupational therapy, which helps them master their personal and work-related activities, such as buttoning clothes or cooking while seated in a wheelchair. Speech therapy will be given to people who have speech problems of physical or psychological origin. In addition, people with disabilities will require psychotherapy to help them overcome the emotional and psychological problems that are sometimes associated with disability

### *III. POLICY GUIDELINES*

AACSI policy guidelines are integrated into the Organization's general framework of research and training as provided in the Procedure Manual. It is expected that the more the policy is effectively implemented; better performance shall be achieved by AACSI staff. For this reason, all stakeholders are called to take the following guidelines into consideration:

- Provision of distinctive research findings,
- Development of structures that facilitate lifelong learning & Career building for the staff,
- Developing priority research topics which meet APIST and the region's needs,
- Using a research system which can promote creative and innovative spirit and favor active methods,
- Combining knowledge and wisdom to promote Eswatini and universal cultural aspects.



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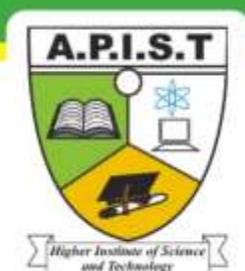
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### *IV. PARTNERSHIPS*

AACSI will try to enhance its national and international perspectives through nurturing a working together with well-known research institutions. Such partnership arrangements will help foster research and training excellence through:

- Giving researchers opportunities to develop and enhance their skills through capacity building,
- Recognizing and rewarding researchers for excellence through research staff promotion,
- Facilitating and sponsoring researchers and trainees in conducting research,
- Availing opportunities for the improvement of conducting research, relevant scholarships and the knowledge about people' learning,
- Evaluating the research units, unit materials and research programmes in a routine and reliable way with a view to formative improvement,
- Maintaining and developing the professional skills of the research staff and unit review procedures.



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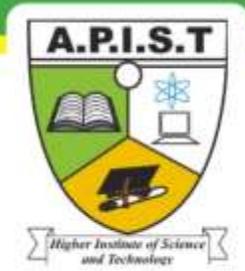
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### *V. QUALITY ASSURANCE*

AACSI is committed to the maintenance of the standards and continuous improvement of the quality of all its activities. Quality assurance requires that periodic reviews on each of the research units be done to ensure the outcomes are continuously modified to suit the requirements given the changes in the external environment. All research activities offered under the auspices of the organization will be subject to rigorous quality assurance procedures. Quality assurance systems at AACSI will facilitate the ownership and accountability at the point of activity with each step being seen as an opportunity for evaluation through both unit review and self-assessment. This review process will result in action plans and the setting of targets to facilitate systematic improvement. The process will be designed to encourage researchers to be self-critical through collating and analyzing evidence to support the achievement of standards. In addition, internal inspections will provide another valuable mechanism for identifying good practice for dissemination and areas for improvement.

The overall objective will be to improve the quality standards of research at the national, regional and international level.



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### *VI. WHY PARTNERING WITH AACSI*

Partnering with AACSI will allow you to tag along with one of the choice Centres whose pursuit of an interrelated set of core commitments distinguishes it from other undertakings in the Region. AACSI recognizes that a combination of excellent invention and Christian ethical relevance is central to the socioeconomic growth of APIST and of the whole nation.