

# Project Outline for Building Stronger Universities Phase II - SUA

## 1. Strategic choice of focus areas for BSUII partnerships:

### I. Agribusiness Value chains

Sokoine University of Agriculture (SUA) is well known for its strength in providing technical training and conducting research in agriculture and allied fields. However, being the only agricultural university in the country, SUA has been struggling to respond to the needs of the agribusiness community, which calls for a wider range of skills, action research and agribusiness support services. Upon realizing the need for training and development of management and entrepreneurship skills as a means of creating more motivation to self-employment, the Department of Agricultural Economics and Agribusiness (DAEA) under the Faculty of Agriculture transformed its training with more focus on the commercial sector. Since then, the department as a business school has focused on the agribusiness sector with an aim of becoming an organization responsive to changing markets and interacting with the agribusiness community. It envisions facilitating development of the sector to a point where it will be composed of profitable enterprises, operated by competent skilled managers and continuously solving entrepreneurial challenges using sound research findings. The business orientation of the department has led to considerable expansion of business programs, training, research, consultancy and outreach. This, together with the needs assessment that was conducted in 2004, led to new training programs that include entrepreneurship courses that are taught University-wide and a MBA (Agribusiness) degree, which admits qualified graduate students from SUA and other accredited universities in the country and executives from the public and private sectors. In addition, there is a need to introduce a new PhD program in Agribusiness to engage graduate MBA (Agribusiness) students who aspire to pursue further studies in business. The new degree will also accommodate students from other non-Agricultural Universities who wish to join SUA, but at the moment find themselves admitted to the PhD in Agricultural Economics that only offers limited agribusiness courses. Empirical evidence, before even carrying out a formal needs assessment, suggests the existence of a huge demand for the PhD program with specific focus on agribusiness courses. The growing influx of MBA students (who are also academic staff from SUA, Mzumbe University and others) further attests to this great anticipation. SUA seeks to strengthen research capacity and PhD education training in this field by developing appropriate curriculum, research environment and education delivery approaches.

### II. Market oriented Agro-ecology

Agro-ecology is in the process of defining and developing itself as a scientific discipline, in reaction to the perceived shortcomings of single-disciplinary approaches to addressing agricultural complexity. Globally, the academic competences for doing research and for teaching and advising in Agro-ecology tend to be dispersed and often made up of small groups or single researchers/teachers in universities. This is also the case at SUA's Faculty of Agriculture where these academic competences are spread across various departments. This makes it difficult for the Faculty to develop research and educational programs in Agro-ecology with functional and trans-disciplinary content. The dispersed nature of these academic competences also explains why the proposed capacity building activities target the faculty as a whole, rather than individual departments. There is a

particular need amongst faculty members and staff who have not completed a PhD to have access to trans-disciplinary and action-oriented Agro-ecology research environments, with a view to continuing their education. Additionally, the faculty as a whole will benefit from gaining more direction and greater coherence in relation to agro-ecology as a scientific discipline at a time when its contribution towards fulfilling national policy requirements for sustained food production and reform in tertiary agricultural education is called for. Considering that Tanzania's agribusiness sector is faced with the challenge that a great deal of the crops in the country are produced by smallholders with poor market access and limited capacity for quality assurance and grading, capacity building at SUA will focus on improving value chains for smallholders. In particular, SUA identifies a need for further development and adaptation of agro-ecological methods, including climate smart agriculture, to improve productivity along value chains, i.e. eco-functional intensification and diversification with focus on high-value crops.

### III. Aquaculture

Improvement in aquaculture production can contribute to poverty alleviation directly through domestic consumption and income generation or indirectly through employment of the poor as service providers to aquaculture or as workers on fish farms of wealthier farmers or by providing low-cost fish for poor rural and urban consumers (Demaine, 2009). According to Wijkstrom and MacPherson (1990) small-scale fish farming with commercial orientation can be a very profitable activity and the wealth generated through fish farming may be a powerful tool for poverty reduction for the rural poor. In Tanzania aquaculture is still a subsistence activity practiced by small-scale farmers who own one to three small ponds. Therefore, aquaculture needs to be developed in such a way that it contributes significantly to the national economy and food security. In order to be economically, socially and environmentally sustainable the aquaculture industry requires highly educated, trained and experienced staff to address successfully the challenges of the industry and to meet further anticipated future growth.

Sokoine University of Agriculture (SUA) has the mandate for training, research and provision of services to the public and private sector in agricultural related fields including aquaculture. SUA, as the only agricultural University in Tanzania, provides training in aquaculture in the country. Undergraduate degree training in aquaculture (BSc Aquaculture) at SUA started in 2004 and since then, a total of 125 students have graduated in five (5) batches. Most of them have been absorbed by central government, local government authorities, parastatal organizations and the private sector. The proposed project will address the problem of lack of conducive environment for research-based training as well as lack of appropriate teaching skills among the University lecturers. The lecturers, who teach in aquaculture, are not professional teachers and they have not been exposed to didactic training. Thus, they neither have the formal traditional teaching techniques nor the new teaching practices necessary to establish problem solving and experiential learning environments. Consequently, the learners suffer from inadequate hands-on training; are poorly exposed to problem-solving and lack adequate exposure to real-life experiences. This becomes a challenge to both the graduates and their employers as there is a disconnection between education and expectations regarding job performance requirements. The problem is aggravated by the lack of relevant reference books for aquaculture.

The government of Tanzania has now recognized the importance of research as a major driver of socio-economic development. The government recognizes that high quality research can maximize the productivity of fish farming through development of improved management practices, water harvesting, improving quality of feedstuffs, improving the genetic potential of the cultured fish species, sustainable disease control, delivery of better extension services, processing and marketing of fish products. Despite this awareness of the role of research in facilitating development, progress towards the desired fish production targets has been slow. One of the reasons for the slow progress is that there is limited capacity to conduct research that leads to development of appropriate technology and favourable policy environment for aquaculture. Most research institutes lack appropriately trained staff. The available staff often lack the necessary training and experience with which to conduct advanced research that can solve the problems of the aquaculture industry. This is due to the fact that aquaculture in Tanzania is relatively new compared to crop and livestock production, hence, most staff employed in Universities and research institutes are junior people and lack the necessary skills for conducting research that is relevant for the development of the industry.

Another problem facing Universities and research institutes is lack of appropriate infrastructure for conducting world class research. This has been contributed partly by the fact that aquaculture research is still at its infancy stage in Tanzania. Furthermore, most research institutions involved in aquaculture research have limited access to information resources, both conventional (hard copy) and electronic. Lack of reliable Internet connectivity complicates access to free and open-access electronic or online resources. A major reason for this lack of resources is simply cost. There is a need to improve fish production from aquaculture to complement the capture fisheries. The urgent need to increase aquaculture production in Tanzania will only realistically occur following a radical change of the production systems. Such a change would improve production of farmed fish and contribute to food security and poverty alleviation and rural development in most parts of the country. An essential prerequisite for this radical change in aquaculture practices is development of better management practices and affordable technologies by motivated personnel, highly trained in the different fields of aquaculture. Thus, SUA seeks supports to strengthen research capacity and education delivery in Aquaculture. This will involve training and mentoring young SUA researchers in field and to improve research facilities so that relevant researches in the fields are conducted to facilitate the radical change in aquaculture production in Tanzania. It is envisaged that capacity building will be achieved through establishment of research groups, stakeholder meetings, faculty exchange, methodological trainings, participation in scientific conferences and acquisition of basic infrastructure that support research and research based training .

- *Up-scaling of results and insights gained in the proposed thematic focus areas for the benefit of the entire University*

SUA intends to use different approaches to scale up lessons learnt from the proposed thematic areas to benefit the entire University. This will include integrating such lessons into in-house staff development programmes such as University Teaching and Learning Improvement Programme (UTLIP) through workshops and seminars. In addition, a proposal will be submitted to the University SENATE for integrating the lessons learned

into existing relevant courses through curricula reviews. It is envisaged that presentations at various professional fora such as conferences, workshops and seminars will be used to raise awareness on the lessons learnt and call for collective actions required for their institutionalisation.

## 2. Envisaged output areas

Although outputs outlined hereunder are distributed to specific thematic areas, some of them cut across other themes. For instance, integration of experiential learning and action research, as education delivery mode, is expected to be embraced by all the three thematic areas. PhD methodological courses managed under one thematic area are expected to impact on research capacity and PhD education training in other thematic areas. Overall, the structure of BSU will enhance realisation of synergies in activities conducted in different thematic areas and at same time ensure sustainability of such activities beyond BSU II by anchoring them in specific departments with relevant expertise.

- I. Capacity for research and training in Agribusiness value chain strengthened
  - a. New PhD curriculum in Agricultural Value Chain (AVC),
  - b. PhD training and research capacity in Agricultural Value Chain (AVC) strengthened.
  - c. New PhD education delivery approach based on Integrating Experiential Learning and Action Research introduced and mainstreamed
  - d. A PhD course in Agribusiness Value Chains in a Methodological Perspective, developed, implemented and institutionalised
  - e. A PhD course in Qualitative Research Methods, developed, implemented and institutionalised
  - f. A PhD course in Entrepreneurship and Innovation in a Methodological Perspective, developed, implemented and institutionalised
  - g. Course materials for three PhD courses developed
  - h. 120 PhD students, at least 30% female, trained in methodological courses.
  - i. 6 SUA staff capacitated to implement PhD courses
- II. Research capacity and PhD education delivery in Agro-ecology enhanced
  - a. New PhD curriculum in Market oriented Agro-ecology
  - b. PhD training and research capacity in Market oriented Agro-ecology strengthened.
  - c. A PhD course in hydrological modelling developed, implemented and institutionalised
  - d. A PhD course in Multivariate analysis and developed, implemented and institutionalised
  - e. Course materials for two PhD courses developed
  - f. 80 PhD students, at least 30% female, trained in methodological courses
  - g. 4 SUA staff capacitated to implement PhD courses
- III. Capacity for research and training in Aquaculture strengthened
  - a. Twenty University teaching staff trained in didactics and pedagogic skills
  - b. Six compendia and practical manuals for various aquaculture disciplines prepared
  - c. Twenty young researchers trained in research methodology and scientific writing
  - d. A network of aquaculture scientists in Tanzania and Denmark established and functioning
  - e. The level of skills in Aquaculture graduates increased
  - f. A PhD course in Experimental Design and Quantitative Data Analysis developed, implemented and institutionalised

- g. Scientific Writing and Scientific Communication developed, implemented and institutionalised
- h. Course materials for two PhD courses developed
- i. 80 PhD students, at least 30% female, trained in methodological courses
- j. 4 SUA staff capacitated to implement PhD courses

*IV. Output areas in relation to services and facilities supporting research with the support of the BSUII, whether as part of the partnerships with Danish partners or in separate workstreams*

- a. The speed of processing financial transaction increased and errors reduced through acquisition and use of a modern Financial Management Information System.
- b. Research facilities in Aquaculture and Agro-ecology laboratories upgraded and fully utilised
- c. Access to e-resources in the three thematic areas improved

### 3. Management structure and institutional anchoring for the partnership, including key staff

- BSU II will administratively sort directly under the Directorate of Research and Post-Graduate Studies, DRPGS, which has the overall responsibility for handling research grants, and which answers to senior management at the university.
- There shall be a BSU coordinator, who is a senior staff who knows the BSU program well and can handle the communication with Danish Partners, DFC, the University management, the BSU team leaders and the BSU program Assistant.
- The Coordinator shall be responsible for technical coordination BSU activities including preparation of technical and financial reports.
- There shall be a full-time BSU program Assistant responsible for day-to-day management of the program, to follow up on BSU activities, and in particular to ensure that financial and performance monitoring and reporting is done timely, comprehensively and according to the quality criteria set for BSU.
- For each of the thematic areas there shall be a team leader (TL) responsible for managing that particular area including the resources allocated to it.
- The Coordinator, program Assistant and the team leaders will together make up the BSU Management Group that will be responsible for BSU implementation, including monitoring and reporting to DFC. Meetings of the Management Group will be chaired by the Coordinator, the meetings prepared by the program Assistant.
- In addition there shall be an Advisory committee comprised of 5 staff, at least two of whom shall be female, who are not TLs, who will act as a “think tank” around BSU II implementation and preparation for BSU III.

### 4. Key expectation to partners, other concerns and risks

- Expert knowledge and pedagogical skills in agricultural value chains
- Expert knowledge and pedagogical skills in Experiential Learning and Action Research
- Expert knowledge and pedagogical skills in market oriented Agro-ecology
- Expertise in aquaculture

- Pedagogical skills on Experimental Design and Quantitative Data Analysis
- Pedagogical skills on Qualitative Research Methods
- Pedagogical skills on Scientific Writing and Scientific Communication
- Pedagogical skills on Agribusiness Value Chains in a Methodological Perspective
- Pedagogical skills on Entrepreneurship and Innovation in a Methodological Perspective
- Pedagogical skills on Multivariate analysis
- Expert knowledge and pedagogical skills in Hydrological modelling

- *Concerns and possible risks envisaged, and possible mitigating measures*

S/N	Concerns and possible risks envisaged	Possible mitigating measures
1	Lack of commitment from institutions and insufficient incentives for key persons both in South and Denmark	A comprehensive inception phase with emphasis on further dialogue and clarification of expectations from South and Danish institutions to enhance the ownership as the development engagements.
2	SUA may not be able to obtain support tailored to its needs	SUA has a history of collaborating with 7 Danish Universities involved in BSU I and is well aware of each other's capacities and needs. Engagement of DFC in the dialogue process to ensure tailoring and synergies. Continued dialogue with the North partners for necessary adjustments.
3	Additional administrative burden as SUA takes over management of the programme grants	DFC will provide the necessary financial management support to shoulder the task.
4	DANIDA financial regulations adds to SUA's administrative burden	DANIDA will continue to promote alignment with SUA financial management system and procurement rules and consider to enhance the technical support to the institutions

## 5. Process Action Plan for a three-month inception phase

SUA researchers and their Danish partners will engage in dialogue to jointly develop a more detailed development engagement (i.e. a programme description) by indicating clear objectives, activities and expected outputs with tangible and measurable indicators. Modalities for dialogue between SUA and Danish Partners will be agreed upon by specific thematic teams following mutual consultations to determine availability and convenience. Partners are expected, to the degree possible, to adhere to following action plan:

S/n	Activity	Time frame, 2014		
		May	June	July
1	Signing of tri-lateral agreement			
2	DK partners to visit SUA for groundbreaking meeting			
3	Dialogue between partners on the structures of the two PhD programs (Agribusiness and Agro-ecology): courses and credit hours			
4	Draw-up plans for developing program-specific course materials for the PhD programs			
5	Formulate plans for developing and implementing PhD Methodological courses			
6	Identification of suitable pedagogical approaches and delivery methods for PhD courses			
6	Identification and development of course assessment methods			
7	Partners to agree on the timing of program-specific and methodological PhD courses			
8	Formulating plans for taking the designed new PhD programs and Methodological courses through the SUA approval process			
7	Dialogue between partners on the type and timing of faculty exchange for capacity building			
8	Identification of required basic infrastructure and facilities, including procurement plans			
9	Develop plans for training and mentoring 15 finance department staff			
10	Identify areas for research capacity improvement in aquaculture			
11	Draw-up plans for improvement of research environment and research-based training in aquaculture			
12	Detailed description of thematic focus including, objectives, activities, output, indicators and budget.			
13	SUA partners to visit DK to finalise inception report			

## 6. Indicative budget

s/n	Objective	Main output	SUA	Danish partner
1	Research policies, strategies, organisation and research processes improved.	1. New PhD curriculum developed and research capacity strengthened in agricultural value chain	1,640,000	1,215,000
		2. New PhD curriculum developed and research capacity strengthened in market-oriented Agro-ecology	1,640,000	1,215,000
		3. Research and training environment for aquaculture strengthened	1,640,000	1,215,000
2	University-wide services and facilities to support research activities strengthened	1. Financial Management Information System acquired	174,141	130,000
		2. Staff (15) in the finance department trained and mentored by Danish partners	60,000	100,000
		3. University library upgraded	125,859	125,000
3	Basic infrastructure (10% of total Budget)	Refurbishment of laboratories	720,000	
	<b>Sub-total</b>		<b>6,000,000</b>	<b>4,000,000</b>
4	Project administration			
4.1	Institutional Overhead (12% for SUA and 20% for Danish Partners)		720.000	800.000
4.2	Coordination office (8%) – for annual workshops and salary for the Coordinator, Monitoring and Evaluation		480.000	
<b>GRAND TOTAL</b>			<b>7,200,000</b>	<b>4,800,000</b>

## 7. Annex: Overview of the University ([www.suanet.ac.tz](http://www.suanet.ac.tz))

### 1. Basic institutional facts of SUA

a) **SUAs research activities** are guided by *The National Research and Development Policy of Tanzania of 2012*, which provides a guiding framework for the planning of research activities in the country by different research institutions including universities. Of particular interest to BSU proposal is the policy statement regarding Regional and International Cooperation, which notes the inadequate participation of Tanzania in strategic international R & D systems, and therefore sets the following policy objectives: (i) promote strategic partnerships and collaboration between research institutions,



the government, regional and intentional dev. partners, including the diaspora; and (ii) strengthen collaboration between national research coordinating body, research institutions and other regional and international coordinating bodies.

To achieve the stated objectives, it is proposed to: (i) promote strategic partnerships, collaborative partnerships and working relations between local researchers, R & D institutions, regional and international Development Partners including the diaspora; (ii) strengthen regulation and monitoring of internal and external research activities; and (iii) develop a mechanism for continuous popularization of research activities and outputs through various fora.

#### b) Number of students:

Table 1: Total Number of Students enrolled at SUA from 2006/7 – 2012/13

Year	Both Undergraduate & Postgraduate students			
	Female	Male	Total	%Female
2006/7	853	2,158	3,011	28
2007/8	870	2,065	2,935	30
2008/9	1,057	2,807	3,864	27
2009/10	1,316	3,576	4,892	27
2010/11	1,873	4,885	6,758	28
2011/12	2,234	4,994	7,228	31
2012/13	2,660	5,548	8,208	33
	% Female (Average)			29

Table 2: Number of Students admitted annually at SUA from 2006/7 – 2012/13

Year	Admitted Undergraduate & Postgraduate students			
	Female	Male	Total	%Female
2006/7	419	990	1,409	30
2007/8	340	814	1,154	29
2008/9	469	1,495	1,964	24
2009/10	582	1,620	2,202	26
2010/11	859	2,181	3,040	28
2011/12	708	1,355	2,063	34
2012/13	1,041	2,069	3,110	33
	% Female (Average)			29

#### c) Thematic foci of the university:

SUA is basically an agricultural university offering training in the fields of Agriculture, Forestry and Nature Conservation and Veterinary Medicine. However, with time, other disciplinary areas have been added, including Science Education, Environmental Science and Rural Development. Academically, the university is therefore composed of the Faculties of Agriculture, Forestry and Nature Conservation, Veterinary Medicine and Faculty Science, as well as the Development Studies Institute.

**d) Number of academic (teaching and research) staff**

Table 3: Number of SUA academic staff by ranks and qualifications

a). Academic rank				
	F	M	T	%
1.Professors, Research Professors and Librarian Professors	6	69	75	15
2.Associate Professors, Associate Research Professors and Associate Librarian Professors	9	63	72	14
3.Senior Lecturers, Senior Research Fellows and Senior Librarians	12	61	73	14
4.Lecturers, Research Fellows and Librarians	28	72	100	20
5.Assistant Lecturers, Assistant Librarians and Assistant Research Fellows	34	121	155	31
6.Tutorial Assistants and Trainee Assistant Librarians	7	26	33	6
<b>Total</b>	<b>96</b>	<b>412</b>	<b>508</b>	<b>100</b>
1. Ph.D.	33	211	244	48
2. Masters degree	56	175	231	46
3. Bachelors degree	7	26	33	6
<b>Total</b>	<b>96</b>	<b>412</b>	<b>508</b>	<b>100</b>

Table 4: Total number of SUA Technical and Administrative staff and their qualifications

Qualifications			
	Female	Male	Total
1. PhD degree	2	3	5
2. Masters degree	14	41	55
3. Postgraduate Diploma	1	7	8
4. Bachelors degree	17	55	72
5. Advanced Diploma	7	21	28
6. Ordinary Diploma	34	53	87
7. Certificate	222	362	584
8. Secondary education and below	2	11	13
<b>Total</b>	<b>299</b>	<b>553</b>	<b>852</b>

**e) Annual budget**

Table 5: Sources and funding trend at SUA from 2006/7-2011/12

Year	Government budget		Development Partners		Internal Income		Total (Tshs)
	Tshs*	%	Tshs	%	Tshs	%	
2006/7	17,624,805,742	69	6,568,781,944	26	1,289,360,764	5	25,482,948,450
2007/8	17,248,925,915	64	7,425,320,175	28	2,166,320,765	8	26,840,566,855
2008/9	25,426,785,321	64	8,585,379,167	21	5,994,283,336	15	40,006,447,824
2009/10	25,656,418,063	49	19,787,813,486	38	6,801,491,967	13	52,245,723,516
2010/11	29,663,006,403	49	18,302,134,299	30	12,643,484,679	21	60,608,625,381
2011/12	27,456,594,044	48	19,062,009,903	33	11,109,011,041	19	57,627,614,988
<b>Total (Tshs)</b>	<b>143,076,535,488</b>		<b>79,731,438,974</b>		<b>40,003,952,552</b>		<b>262,811,927,014</b>

<b>Total (DKK)</b>	<b>510,987,626</b>	<b>284,755,139</b>	<b>142,871,259</b>	<b>938,614,025</b>
<b>Mean (%)</b>	<b>55%</b>	<b>30%</b>	<b>15%</b>	<b>100%</b>

\* Exchange rate for 1 DKK is equivalent to Tshs 280

#### f) Annual budget and share from government

Table 6: Share of Government and Donor Contributions from 2000/01 – 2011/12

Year	% Contribution	
	Government	Donors
2000/01	69	31
2001/02	76	24
2002/03	71	29
2003/04	73	27
2004/05	72	28
2005/06	69	31
2006/07	74	26
2007/08	76	24
2008/09	70	30
2009/10	47	53
2010/11	60	40
2011/12	55	45

## 2) Cooperation with Danish universities

Cooperation with Danish universities goes back several decades starting with the establishment of the Faculty of Forestry and later the Faculty of Veterinary Science (later Vet Medicine) in the 1970s with DANIDA support. The University of Copenhagen in Denmark was the major collaborator in developing the curriculum and in training the staff for the new Faculty of Vet Science. It also sent staff to teach in the new Faculty as local staff were being recruited and trained.

## 3) Information on other donor funding

Table 7: Major donors for SUA for the year 2013/2014

S/N.	Name of Project	Donor	Amount (Tshs.)	Amount in DKK
1.	Enhancing Pro-poor Innovations In Natural Resources and Agricultural Value Chain (EPINAV)	Government of Norway	5,410,869,988.14	19,324,536
2.	Programme for Climate Change, Impact, adaptation and Mitigation in Tanzania	Government of Norway	5,717,738,272.24	20,420,494
3.	Advancing Soil Health in Africa	Alliance for Green Revolution in Africa (AGRA)	596,234,646.00	2,129,409
4.	Enhancing the Measuring , Reporting, and Verification of Forest in Tanzania	Government of Norway	2,507,151,733.00	8,954,113
5.	Enhancing Climate Change Adaption and Mitigation Capacities of Vulnerable Communities	International Development Research Centre (IDRC) of Canada	502,817,074.13	1,795,775

6.	SUA Wellcome Trust	Wellcome Trust	2,414,018,360	8,621,494
7.	World Bank Projects	World Bank	4,816,260,000.00	17,200,928
8.	Other projects	Various donors	4,624,000,000.00	16,514,285
<b>GRAND TOTAL</b>			<b>26,589,090,073.51</b>	<b>94,961,036</b>

#### 4) SUA Corporate Strategic Plan

The CORPORATE STRATEGIC PLAN (CSP) 2011 – 2020 and its implementation work plan (2011-2015) put more emphasis on capacity development, quality assurance, ICT development, promotion of internal income generation activities and public and social services as well as research and outreach activities. It focuses on the University's core functions of teaching, research and public service.

According to the CSP the Mission of the university is to: **Promote development through training, research, and delivery of services.** One of the key thematic areas identified under the plan is Basic and Demand Driven and Applied Research, where the stated objective is to undertake basic and applied research to generate new knowledge that responds to the contemporary and emerging needs of the society. The proposed strategies include:

- Addressing issues of poverty reduction and national priority
- Sensitizing government on the positive and critical role of research and the need for increased funding including funding of programmes that support national development agenda
- Promoting university-private sector partnership to attract research funds in areas of mutual interest
- Engaging in basic research and strengthen applied research to contribute to the generation of new knowledge and technologies
- Enhancing researchers access to reliable and current information
- Enhancing access to international research funding possibilities, and
- Strengthening research infrastructure by establishing and equipping research laboratories separate from teaching laboratories.