

Kwame Nkrumah University of Science and Technology (KNUST)



Building Stronger Universities (BSU) - Phase II

PROPOSAL

## I. STRATEGIC THEMATIC AREAS

**Theme 1: Climate-smart water and environmental management:** Research capacity building on processes and interventions related to climate-smart solutions in agriculture, water resources and environment management. Specific areas include, climate resilient agriculture, enhancing agricultural productivity, food safety and security, environmental health, afforestation, smart mineral extraction processes, halting land degradation, managing alien species invasion, restoration of degraded landscapes, safe pesticide use in rural communities; innovative climate modeling techniques for natural resources management Advances in GIS and Remote Sensing: *Sample research questions/hypotheses:* Understanding the farm to fork approaches that will optimize food production and farm productivity; Better water (re)use that will lead to higher efficiency of water resources; Developing good climate models will lead to optimized vegetable production in peri-urban areas; improved governance environment will reduce the level of conflicts associated with natural resource management and us)

The theme will be led by College of Agriculture and Natural Resources but will work closely with College of Science

**Theme 2: Entrepreneurship and job creation:** Market oriented capacity building and entrepreneurship for job creation and sustainable economic growth (securing productive enterprises for KNUST graduates, supporting government in job creation; value chain analysis, promotion of sustainable growth and employment through research, education and dissemination of research findings. *Sample research questions/hypotheses:* Linking research to industry will improve job creation potential of local industries; Orienting university curricula to reflect and entrepreneurship will lead to job creation, growth and development; and institutional changes and strategic options are needed to restore the confidence in stakeholders regarding the University's capability to effectively contribute job creation and national development)

This theme will be led by College of Arts and Social Sciences but in close collaboration with College of Agriculture and Natural Resource

**Theme 3: Health-care delivery systems:** Research and knowledge management for improved health care delivery systems in Ghana. This could include, vector control practices, antibiotic resistance studies, health-care seeking/treatment practices, safe sanitation and hygiene practices, pharmaceuticals and drug quality studies, improving health-care delivery in local health facilities, zoonotic infections and the one-health concept. *Sample Research questions/hypotheses:* Better training in hygiene and sanitation is basic to improved health delivery systems; development of training materials to improve the understanding of zoonotic infections is relevant to the one health concept; continued focus on linking research to action or translating knowledge to action through advocacy and promotional

strategies at the expense of building specific competencies, skills and techniques required to carry them out is counter-productive to effective health-care delivery).

This theme will be led by College of Health Sciences but in collaboration of College of Science

## II. ENVISAGED OUTPUT AREAS

### **IO 1: Strengthened institutional capacity to deliver quality research and postgraduate education**

1. **Strengthened Research Processes** for enhanced competitiveness in accessing international and external research funds; improving research quality; building nodes of innovation and knowledge production; proof of concepts; and intensifying partnership with Danish Universities for new areas of collaborative problem-based research programmes. The expected outputs from this will include:
  - Enhanced capacity of academic staff at KNUST on research proposal development for competitive funding enhanced among academic staff at KNUST. This will be achieved through (i) training of KNUST staff (with a priority on early to mid-career researchers and women researchers) (ii) joint development of theme-based proposals (1-3 per theme) between the Danish and KNUST researchers and submitting them for external funding such as DANIDA, European Union, CIDA, BMGF, etc. This will enhance the learning processes associated with resource mobilization, peer review of research proposals, increase the potential to KNUST accessing resources in pursuit of its vision; and facilitate the establishment of North-South research teams in specific research areas of common interest.
  - Developed and institutionalized guidelines on developing and managing small research projects (MScs, PhDs, baseline research) which will be administered by KNUST It is expected to enhance the capacity to generate new knowledge and offer staff the opportunity to share such knowledge with relevant stakeholders. This will be one example of building on the outcomes or lessons learnt from theme-specific pilot research projects to be implemented.
  - Updated and technically retooled academic staff on innovative specialist and advanced methodologies on selected topics in the thematic research fields of interest through theme-based specialized short courses for each of the 3 themes (e.g., one good example will be innovative climate modeling techniques or for natural resources management, reducing conflicts resulting from overexploitation

of natural resource, use of GIS and Remote Sensing for landscape and watershed research studies)

- Improved teaching, research supervision, and laboratory/field research protocols and setups at KNUST through staff exchanges with Danish universities. KNUST staff exchanges to most successful research groups in Denmark (and vice versa) to learn on the research and teaching approaches used, organizational setups resulting in institutionalized of best practices at KNUST. Danish staff support the establishment of research teams within two colleges to serve as models for scaling to other Colleges.
- Improved stakeholders engagement climate smart water and environmental management issues

2. **Enhancing PhD Education** to produce students that acquire increased capacity to analyze and address contemporary issues, to identify and address the right research questions to generate new knowledge of high quality and relevance to society, ably support the university's research output, increased appearance at knowledge dissemination fora and other outreach activities, possess innovative entrepreneuring and other skills for the changing job markets all leading to an overhaul of the existing PhD process to correctly address the needs of society.

- Institutionalized university-wide PhD courses in (i) Quantitative and qualitative research Methods (ii) Scientific and Academic (thesis) Writing (iii) Research Planning and Research Proposal Writing (iv) Innovative statistical and modeling techniques, (v) Effective Information Search and Management Strategies, (vi) .
- Developed and approved university-wide guidelines on PhD thesis supervision, with clear responsibilities for students and supervisors, and tracking progress to achieve problem oriented dissertations and high impact journal publications and thereby enhancing the KNUST's visibility in knowledge creation and dissemination to relevant stakeholders.
- Academic staff at KNUST empowered and supporting student-centered PhD supervision for enhanced capabilities of PhD students to conduct independent research to identify solutions to problems impeding economic growth and development. Piloted in three colleges and eventually scaled out to other colleges.
- Two new theme-based PhD Programs developed (curriculum developed and approved) and two existing strengthened (curriculum improved) to reflect

emerging market demands. Two colleges encouraged to identifying and developing from the following: Agribusiness Management, Extension and Rural Development, value chain analysis; Geo-information Science (GIS) for Natural Resources Management, Pharmaceutical/Medicines regulation, Molecular Pharmacology and Toxicology and Project Management (MBA Specialization)

**3. Direct PhD training for younger academic staff** to strengthen the human resource base and increased capacity to translate local and international research to the benefit of Ghana.

- Number of **academic staff with PhD** qualifications increased by initiating additional PhD scholarships (for example in the College of Health Sciences in specific areas). PhDs will be in tandem with the identified theme and be co-supervised by Danish Universities. Research skills acquired during the PhD training to be applied in their own research, teaching, and service to society.

**IO 2: Improved university-wide services and facilities that support research**

**4. Improved university-wide facilities and services** that lead to good governance including effective, efficient and transparent donor supported project administration and reporting, increased donor confidence, improved access and management of web-based information to achieve effective research communication and other outreach activities and :

- Improved grant management and research support services. This will be achieved through initiatives such as
  - Development of management and monitoring system for external research grants
  - Established College Grant Offices to give grant management support at the College level, starting with colleges coordinating theme activities
  - Guidelines and policies to govern processes and procedures for management of external research grants in the university (e.g. proposal routing, authorization, project staff, effort reporting, etc) available in the Colleges.
  - Central database of grants available and aiding in effective monitoring by the University
  - University administrators and finance officers, internal auditors have capacity to provide research support services to researchers in the area of research administration, project management, institutional grant guidelines and policies reviews, budgetary planning and monitoring, and procurement

leading to improved research grants management and compliance with institutional and donor requirements

- Financial management systems for grants management which satisfy international standards for accounting and audit instituted at the grants office and all Colleges.
- An automated grant accounting auditing systems developed and operational across university
- Improved access to information by researchers and PhD students through
  - Improved University library services for timely and efficient access of available international research resources
  - Faculty and postgraduate student access international resources (e.g. journals and e-books) as well as for downloading and printing promptly through access to Research Commons facility in the University library

#### **4. Strengthening management and quality control processes** of KNUST central research laboratory to meet international standards

- Training modules on proper laboratory equipment use and good laboratory practices available for guided training of all research students prior to use of any designated graduate laboratories of the University
- SOPs, and protocols of international standards available and used in all designated research laboratories in the University
- Laboratory management systems (including inventory and maintenance management, log-in systems, online scheduling, billing systems, etc.) instituted and used in the University

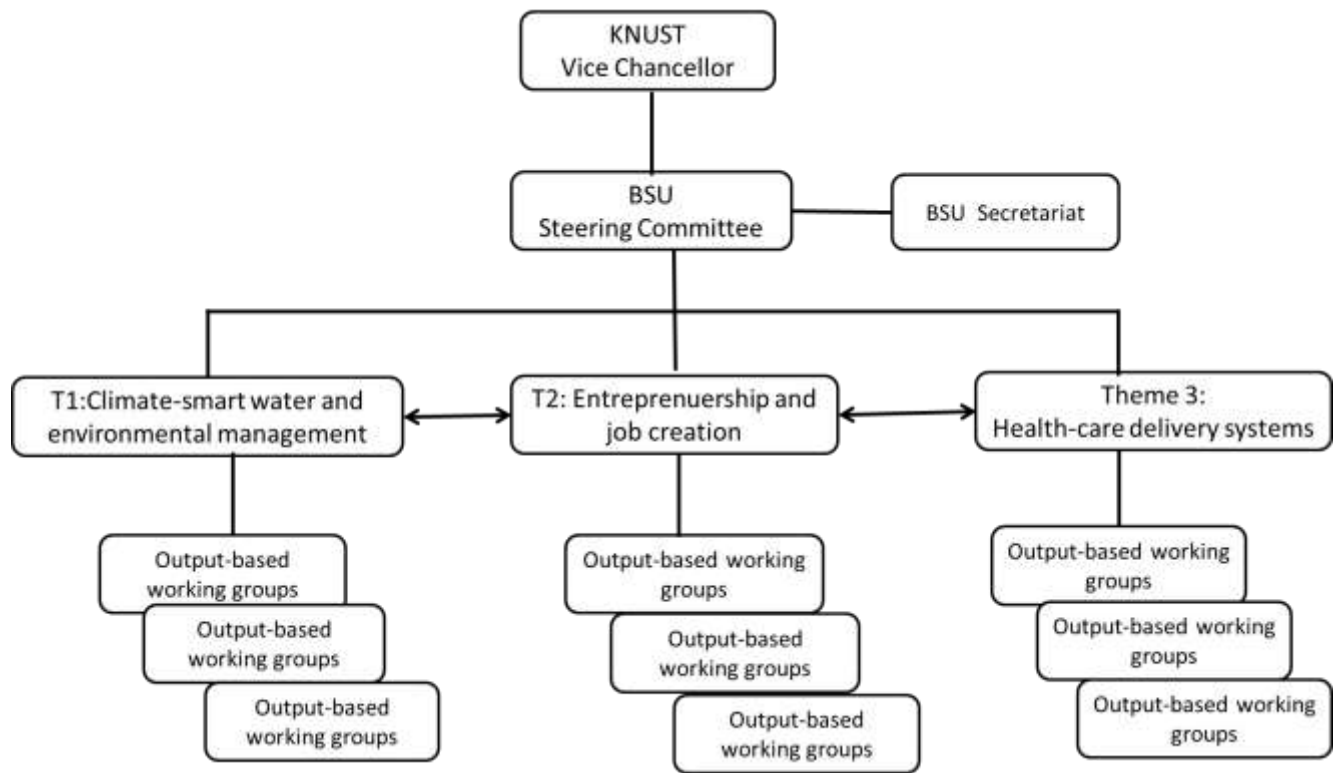
#### **Dissemination and out-scaling of project results**

Results and outputs will be disseminated directly through outreach sessions including annual PhD students' summer schools; development of policy briefs, manuals and fact sheets, press releases; professional practitioners guide; publication of research in results peer reviewed international journals. These products from the project activities will form the basis of institutionalization of the protocols and processes at KNUST and its affiliate institutions.

### **III. MANAGEMENT STRUCTURE**

The BSU II Project will be managed by a Steering Committee at KNUST that reports to the Vice-Chancellor. The committee will have oversight responsibility for project implementation and financial management. The Steering Committee will meet regularly

to review and take major decisions especially in connection with project progress, financial and procurement issues, review of progress reports for the Vice Chancellor and DANIDA. The Steering Committee will be supported by members who double up as theme coordinators who directly supervise output based working groups. Theme coordinators and steering committee will ensure coherence across themes, and guide upscaling to university level, whenever applicable. The management structure is illustrated in Figure 1. This structure is in tandem with the normal university management structure and BSU II management will follow the normal university decision making structure. The management and activity implementation processes will be administered to encourage female student and staff participation with the view of increasing the visibility of University female research and administrative staff in the delivery of the University’s main products. The immediate point of contact is the Chairman of the Steering Committee who will be responsible for the overall implementation process.



**Steering committee:** Chairman – Prof. RC Abaidoo, Members: Prof. T. Agbenyega, Prof. K. Obiri-Danso, Prof. W. Oduro, Dr. S. Akomea, Head, OGR; Dean School of Graduate School and two women appointed by the Vice Chancellor.

**Key support staff:** Finance Officer, Project Administrator, Office Assistant.

## IV. KEY EXPECTATIONS AND RISKS

### 1. Expectations

- Key expectations to prospective Danish University partners (relationships, staff and knowledge resources, approach, etc.)
- The staff from Danish universities will be committed, available and work in the spirit of real partnership and collaboration.
- Danish Universities will offer additional value in terms of innovative knowledge, expertise and skills to KNUST
- Danish Universities will be ready to learn from KNUST's research and management experiences
- Staff of the North and South demonstrate joint ownership of BSU activities and enjoy mutual respect from each other
- Motivation and commitment among involved resource persons at all levels to participate and share information, use project management tools and deliver outputs and reporting timely and correctly
- Support and recognition by senior management including allocation of resources and time to develop and implement the planned activities

### 2. Concerns and possible risks envisaged, and possible mitigating measures

- **Low motivation and commitment from participating staff:** Could be resolved through creating awareness so that staff recognize that the acquisition of skills is primarily to enhance their work performance and improve on their individual outputs in research. BSU and KNUST could also work out a sustainable rewarding system to motivate staff who spend additional man hours implementing and contributing to BSU activities
- **Competition from other programs:** The project will be competitive (in terms of incentives and quality) to attract the best staff to participate.
- **Government research support and interference:** Expected that policy changes at government levels will not be a risk to the project implementation as KNUST is a government institution.
- **Age skewedness at the university** (gap between junior and retiring members of academic staff) causing lack of continuation – Now being addressed partially resolved by the PhD scholarships.



## V. PROCESS ACTION PLAN FOR A THREE-MONTH INCEPTION PHASE

### Month 1-2:

- A 2-day kick-off meeting between the lead Danish partner and the BSU-II steering committee at KNUST to plan the proposed activities in the inception phase.
- Proposal and budgets shared with Danish partners for detailed inputs in preparation for a joint workshop (see month 2-3 below) to refine and re-align project objectives and outputs
- Thematic joint working groups established and start working on details of each working group and synergies across working groups.

### Month 2-3.

- Joint workshops (theme-based) held in Ghana between Ghanaian and Danish partners to finalize on project details and budgets
- Set up financial, administrative and communication structures with DFC.
- Conducting joint needs analysis
- Comprehensive LFA developed for the themes and the project
- Indicators identified for monitoring progress.
- Finalization and submission of joint proposal, with a detailed implementation plan

## VI. INDICATIVE BUDGET

BSU Phase II Indicative Budget					
	Outputs	Explanation	Amount (DKK)	KNUST - (DKK)	Danish Partner - (DKK)
<b>Immediate Objective 1: <i>Strengthened institutional capacity to deliver quality research and PhD education</i></b>					
1.1	Research proposal development	2 research proposals per theme @ DKK 120,000	720,000	300,000	420,000
1.2	Pilot research project grants	2 pilot research projects per theme @ DKK 350,000	2,100,000	840,000	1,260,000
1.3	Theme-based training on proposal development and grant management	1 workshop per theme @ 150,000	450,000	200,000	250,000
1.4	Staff exchanges - theme based	4 staff from each of the 3 themes @ DKK 60,000	720,000	300,000	420,000
1.5	Short PhD courses: 4 university-wide PhD courses and 6 thematic (2 per theme) PhD courses.	10 courses @ DKK 150,000	1,500,000	600,000	900,000
1.6	University-wide guidelines for PhD supervision and quality assurance	Guideline development @ DKK 600,000	600,000	300,000	300,000
1.7	Theme-based training for PhD supervisors	1 workshop with 20 staff per theme @ 150,000	450,000	300,000	150,000
1.8	Theme based PhD Curriculum development/strengthening	2 new curricula @ 300,00 for new; and 2 for existing @ 100,00 for strengthening	800,000	600,000	200,000
1.9	PhD scholarships for staff upgrades - with specific request from CoHS	Scholarships for staff upgrading at CoHS totaling 1,000,000 and 5 theme specific support scholarships	2,000,000	1,700,000	300,000
<b>Total for Immediate Objective 1</b>			<b>9,340,000</b>	<b>5,140,000</b>	<b>4,200,000</b>

<b>Immediate Objective 2: Strengthened university-wide services and facilities that support research</b>					
2.1	Research grant management and monitoring system established and 14 staff trained on its use		580,000	300,000	280000
2.2	A financial management system for grants established and 14 accounting staff trained on running the grants financial management system		580,000	460,000	120,000
2.3	Library Upgrading - systems and hardware		1,000,000	800,000	200,000
2.4	Laboratory Upgrading - systems and hardware		1,000,000	800,000	200,000
<b>Total for Immediate Objective 2</b>			<b>3,160,000</b>	<b>2,360,000</b>	<b>800,000</b>
	<b>TOTAL DIRECT COST</b>		<b>12,500,000</b>	<b>7,500,000</b>	<b>5,000,000</b>
	12% Overheads		1,500,000	900,000	600,000
	8% Coordinating Costs		1,000,000	600,000	400,000
	<b>TOTAL</b>		<b>15,000,000</b>	<b>9,000,000</b>	<b>6,000,000</b>

## **Annex 1: Overview of the University**

The Kwame Nkrumah University of Science and Technology (KNUST) in Kumasi was established in 1951. Colleges of KNUST include agriculture and natural resources, health sciences, art and social sciences, architecture and planning, engineering and science (see [www.knust.edu.gh](http://www.knust.edu.gh)). The university has the ambition to create learning environments that are research based and universities that are in dialogue with the broader society in which they are embedded. The strategic plan of KNUST addresses policies such as the ICT for Education Policy of the Ministry of Education, the Youth for Entrepreneurship Development Policy, the Tertiary Education Expansion Policy, and the National Institutional Renewal Programme (NIRP) of the Public Sector Institutional Transformation in Ghana.

The total number of students at KNUST is 37,588. Of these, 32,221 are undergraduate students (app. 2/3 male students and 1/3 female students), and 5,379 are postgraduate students (app. 71 male students and 29% female students). The number of teaching staff is 932, and the number of staff principally engaged in research is 38.