

Inception Report

BSU II – Kwame Nkrumah University of Science and Technology

1. Summary Fact Sheet

1.1 Partners

The Partners under this BSU II Project are:

1. Kwame Nkrumah University of Science and Technology (KNUST), webpage: www.knust.edu.gh. The KNUST anchor is Professor Robert C. Abaidoo, Dean School of Graduate Studies, KNUST Email: abaidoorc@yahoo.com Tel: +233208438958
2. Consortium of Danish Universities Applicants (DAs) led by the University of Copenhagen (UCPH). The DA's anchor is Peter Furu, Department of International Health, Immunology and Microbiology, Faculty of Health and Medical Sciences, UCPH. Email: furu@sund.ku.dk Tel: +4535326786

The Kwame Nkrumah University of Science and Technology (KNUST) is one of Ghana's public tertiary institutions. The campus is situated about eight kilometres away from the centre of Kumasi, the Ashanti regional capital, and covers an area of about eighteen square kilometres of undulating land. The campus represents a panorama of beautiful and modern buildings interspersed with verdant lawns and tropical flora that provide cool and refreshing environment congenial for academic studies. The University started awarding its degrees in June 1964. Initially, externally examiners marked all degree examinations externally after they had been marked by internal examiners of the University. Currently, internal and external examiners examine all degree programmes. In addition, some programmes are reviewed by external moderators to ensure that high academic standards are maintained.

The vision of KNUST is to advance knowledge in science and technology for sustainable development in Africa. The mission of KNUST provides an environment for teaching, research and entrepreneurship training in science and technology for the industrial and socio-economic development of Ghana, Africa and other nations. KNUST also offers service to the community. It is open to all people and positions itself to attract scholars, industrialists and entrepreneurs from Africa and the international community. The University operate the collegiate system with six (6) Colleges namely: (1) College of Agriculture and Natural Resources (CANR); (2) College of Architecture and Planning (CAP); (3) College of Art and Social Science (CASS); (4) College of Engineering (CoE); (5) College of Health Science (CHS); and (6) College of Science (CoS). All Faculties and Departments are located on campus with the exception of the Faculty of Forest Resources Technology which is located in Sunyani, KNUST Dairy/Beef Cattle Research Station, Boadi and Agriculture Research Station, Anwomaso. Other Departments outside campus are Medicine, Surgery, Pathology, Child Health, Obstetrics and Gynaecology, Internal Medicine, Surgery, Anaesthesia and Intensive Care, Radiology and Eye, Ear, Nose and Throat all located at Komfo Anokye Teaching Hospital.

1.2 Project Duration

BSU II runs until November 2016. However, it is anticipated that the partnership will be continued beyond this phase in support of long-term institutional capacity building.

1.3. Objectives

The overall objective of the BSU II partnership between the KNUST and the DAs is to support KNUST in creating an enabling environment for high quality and relevant research; and research-based education that will promote sustainable technological and socio-economic development in Ghana and Africa. The specific objectives of this program are to (i) Strengthen KNUST's capacity to deliver quality research and promote postgraduate education and, (ii) Improve university-wide services and facilities that support research.

1.4 Project themes, outputs and activities

This project is organized in four work packages: Three thematic work packages (WP 1-3) and one cross-cutting WP (WP4) that relates to university-wide services and facilities that enhance efficiency of research delivery and ultimately the achievement of KNUST's vision. The three thematic WPs address the core thrust of KNUST's research mandate in all the 6 Colleges. These thematic WPs are: WP1 – Climate-smart Agriculture and Environmental Management (CSAEM); WP2 Entrepreneurship and Job Creation (EJC); and WP3 -Health Delivery Systems (HDS).

The BSU II project will increase the capacity of KNUST staff to effectively conduct and disseminate research in the thematic research areas. The key outputs will be research proposals and dissemination products including manuscripts, PhD staff upgraded, strengthened PhD curricula and strengthened industry-academia linkages. In WP4, the key outputs will be improved administrative and financial grant management, postgraduate supervision processes, as well as university-wide, generic PhD course, library and laboratory facilities and services. The core activities include training and mentoring, conducting of pilot studies and provision of necessary hard and software solutions.

1.5 Budget Summary

	KNUST	DA	Total
WP 1- CSAEM	1.715.676	1.316.840	3.032.516
WP 2 - EJC	1.521.673	1.032.440	2.554.113
WP 3 -HDS	1.422.673	1.032.440	2.455.113
WP 4 - USF	2.589.253	1.346.138	3.935.391
Subtotal - Activities	7.249.275	4.727.858	11.977.133
Inception phase	111.870	306.570	418.440
Coordination costs	579.942		579.942
Overhead	869.913	945.572	181.5485
DFC expenses	99.000		99.000
External Audit	90.000	20.000	110.000
Total	9.000.000	6.000.000	15.000.000

2. Objectives, outcomes, outputs and activities

2.1 Objectives

KNUST's mission is "to provide an environment for teaching, research and entrepreneurship training in science and technology for the industrial and socio-economic development of Ghana, Africa and other nations". Its vision is to "advance knowledge in science and technology for sustainable development in Africa". The BSU Program is central to achieving its mission and vision. KNUST envisages a continuation of the collaboration with DAs in BSU Phase I in supporting KNUST to create an enabling environment for conducting relevant and high quality research and research-based education that will promote sustainable technological and socio-economic development in Ghana and Africa. Specifically, this BSU II program aims at strengthening KNUST's capacity to deliver quality research and promote postgraduate education and, to improve university-wide services to facilitate effective mobilization and efficient use of research funds and access to improved laboratory and library services and facilities that support research.

2.2 Outcome

The BSU Program will strengthen and magnify KNUST's function as a node of innovation and knowledge production and contribution to the economic, social and political development of Ghana. The WPs have been organized to contribute to the development of skilled and motivated graduates who can contribute to the further development of their societies and address the challenges they face. Universities in Ghana are mandated to build human capacity and develop innovative solutions to address the many challenges the country faces. As a university of science and technology, KNUST is expected to provide solutions to the key development sectors in Ghana i.e. Agriculture, Education, Small-scale Businesses, Health and Environment. On this basis, this BSU II project has identified three thematic areas in tandem to the development needs of Ghana and also in line with KNUST's strategic mandate. Therefore, the interventions are expected to accelerated achievement of the KNUST's vision.

It is envisaged that KNUST by 2016 will have in place CSAEM research prioritization and quality monitoring, systems that that guide staff and students in identification of research problems, proposal development and curriculum revision. This prioritization will within the three sub-themes be captured as outcome 1.1 WP1 on CSAEM, as follows: (i) Climate-smart agriculture and agricultural water management – focusing on processes and interventions to enhance agricultural productivity of smallholder farming systems in Ghana (ii) Optimal and sustainable use of bio-resources – focusing on resource recovery and reuse from biowaste to enhance agricultural productivity and reduce environmental pollution and (iii) Ecosystems and natural resources management. At KNUST, research in CSAEM is a main mandate of 3 of the 6 colleges i.e. Agriculture and Natural Resources (CANR), Engineering (CoE) and Science (CoS). For achieving WP 2 (Entrepreneurship and Job Creation, EJC) outcomes, KNUST staff will be mentored to develop curriculum as well as strengthen entrepreneurship teaching and research based on academia-industry linkage models. WP2 on EJC aims at making KNUST highly responsive toward broader societal and market needs in research and economic development. Recognition of the need to 'restore confidence' and directly engage with external stakeholders through university-industry linkages is particularly important, and shows commitment to problem-based principles in promoting sustainable growth and employment. This is a core mandate of the College of Art and Social Sciences (CASS), CANR and college of Architecture and Planning (CAP). Within the implementation period WP3 (Health Delivery Systems, HDS) outcomes will include 20 additional KNUST staff being actively involved in HDS research in the three sub-theme areas and 1 more KNUST CoHS staff will be in the process of upgrading to PhD level. This

will consequently enhance the KNUST's capacity to contribute to research and knowledge management for improved population health and health-care delivery that ensures equitable and accessible health-care provision. HDS will have 3 sub-themes (i) Water and sanitation (environmental health) (ii) Antibiotic and anti-malarial drug resistance (iii) Maternal and child health. At KNUST, this thematic area is the main mandate of 2 colleges i.e. College of Health Sciences (CoHS) and CoS. The outcome of the activities in WP4 is an enhanced capacity at KNUST to provide effective and timely grant management services and ensures improved transparency in grant management, and demonstrates timely delivery of financial reports; in addition, users of KNUST Central Library and Central Laboratory experience higher quality and efficiency of library services. Furthermore, KNUST will have improved quality of PhD research processes driven by availability of user friendly protocols and guidelines on PhD planning and career development skills graduation, and better, healthy supervisor-student relations.

2.3 Key outputs and activities

2.3.1. Research processes

Related to the envisaged outcomes KNUST will be more competitive internationally in research fundraising and conducting quality research in its core thematic research areas, if human resources are upgraded and infrastructural resources are strengthened and can be better coordinated. This is the rationale behind **training and mentoring staff** involved in CSAEM (WP1), EJC (WP2) and HDS (WP3) research **in the entire research process** focusing on: research proposal development, pilot studies, and manuscript writing (Output 1.1.1, 2.1.1 and 3.1.2) as well as **investing in library and laboratory facilities** (Output 4.2.1 and 4.2.2). Science is rapidly evolving hence the need for the capacity of KNUST researchers to be upgraded to effectively use the current research methodologies and techniques in the field, hence need for specialized short courses (Output 4.3.2; also in Output 1.1.1, 3.1.2). Almost all staff at KNUST who are involved in research also have a core mandate of teaching, which often outstretches them. BSU II will be a good opportunity to provide tailored support to these staff and enhance their individual and KNUST's reputation in new research and learning approaches including Problem-based learning. The Problem-based learning (PBL) will enhance PhD students understanding of how various aspects of sustainability are interrelated within a broader conceptual framework of sustainability and the mutual interaction of environmental, economic and social sustainability. In addition, it will offer them opportunity learn about how their teaching can transform traditional engineering and science education to interdisciplinary and integrated problem based learning for sustainable development.

The plan is to take a cohort of carefully selected participants, who are or will be KNUST staff with strong research ambitions, through the entire process, so no ad-hoc activities will be conducted. Three cohorts of 60 staff (20 each from CSAEM, EJC and HDS) will participate in the process, which is planned to take 1 year (see Gantt chart). No common parallel trainings will be conducted and synergies have already been created in the three WPs for common training (see Gantt chart). For example, the stakeholder workshop will be held in the same day, while some elements in the research process like research management will also be conducted in a common pool. The thrust will be on hands-on-training and mentoring, so that at the end, other than improved skills among participants, the participants will have products (concept notes in key research issues, proposals to submit for external funding and manuscripts to submit for journals publication).

2.3.2. Facilities and support services

A prerequisite for strengthened research processes will be the **good administrative and financial grant management support to researchers**. KNUST has a newly created Office for Grants and

Research (OGR). OGR needs strengthening and its functions decentralized to colleges so that it can support researchers in identifying and responding to calls for external funding and publications. Various projects have employed different Project Administrators, who are in charge of logistics and reporting to donors. However, most of them have no training of project administration and many reports are delayed or not up to required standards. This jeopardizes the potential successes in attracting future research funds. In addition, while finance officers in colleges continue to do financial management of projects, they need specific training on financial grant management. In BSU II, there is urgent need to train financial and administrative grant administrators as well as strengthening the OGR as explained in Output 4.1.1.

Additionally, investments in equipment like for example library and laboratory are needed but will be need-based especially to support the cohort of participants in their respective research process but also beyond meeting the needs of the broader KNUST research community.

Overall, the engagement from the DA in this area will be a mentoring and co-training approach to upgrade KNUST senior staff skills to conduct training with some support from DAs.

2.3.3. Postgraduate Education and Research

KNUST already offers Department-based PhDs. For example, the Department of Civil Engineering offers PhDs in Civil Engineering. However, there are growing demands from the industry for offering subject/theme specific research. In this regard, BSU II will pilot **3 new thematic-based PhD programs** under WP1 (PhD in Environmental Science Policy and Management) and WP2 (PhD Agriculture Business Management; and PhD Business Administration) as described in Output 1.1.1 and Output 2.1.2. The process will benefit from the already developed PhDs but the plan here will be ensure active participation from industry stakeholders. It is planned that the required curricula for the 3 PhDs will be developed and submitted for approval by end of the BSU II project.

An important aspect of postgraduate education and research is the strengthening and rationalization of **guidelines for postgraduate education**. KNUST needs university-wide guidelines for postgraduate research and supervision which clearly outline responsibilities for students and supervisors, quality requirements, and even a tracking progress so as to achieve problem oriented dissertations and high impact journal publications. The current guidelines are college based and many of them are drafts only except the composite one from College of Health Sciences. Furthermore, the School of Graduate Studies runs an ineffective manual system for tracking and monitoring thesis assessment. As a response to current challenges it is highly important to **equip staff who supervise postgraduate research with necessary tools and skills** through mentoring and training. In this regard, selected active supervisors will undergo training and mentoring (part of it done in Denmark) to improve their supervision skills. BSU II (Output 4.3.1.) will liaise with the School of Graduate Studies to strengthen and approve the guidelines, improve supervision skills and install an electronic tracking system for the PhD research thesis monitoring process

Universities with a large pool of postgraduate students offer methodology and analytical courses that help students conduct better research. These courses may include (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, and (vi) Problem-based Learning approaches. At KNUST, these courses have been developed and in many cases at department level. BSU II will support in packaging and **institutionalizing these university-wide courses so that every PhD student** will be mandated to do these courses as part of the PhD requirements. The plan is to start with the 5 courses and in subsequent BSU phases, the number will be added.

2.3.4. Staff Upgrading to PhD level

The CoHS has made a specific request to upgrade some of its staff to PhD level. This direct PhD training for younger academic staff at CoHS will strengthen the human resource base and increase capacity that will translate local and international research to the benefit of Ghana. Initially, one PhD programme will prioritize one of the sub-themes identified under HDS and will register in KNUST and be co-supervised by Danish Universities. Research skills acquired during the PhD training will be applied in their own research and in teaching. We are aware that the PhD will not be completed under BSU II, but we have budgeted for the whole PhD Program (see Budget, Gantt chart).

3. Partnership Management and Governance

The overall management structure is illustrated in Figure 1 below.

The BSU II KNUST partnership is headed by overall Anchors at KNUST and UCPH assisted by work package leaders and a project management support team responsible for cross-cutting day-to-day project communication, monitoring and management.

In total, the partnership covers four work packages each headed by a KNUST and DA leader who share the overall responsibility for carrying out, monitoring and reporting on the specific WP activities outlined in the Inception Report and for ensuring that specified outcomes and outputs are achieved. Their tasks also include, with advice from the coordinators, the drafting of terms of reference, and recruitment, briefing and debriefing of resource persons for specific assignments. Furthermore it is assumed that the WP leaders support the establishment and maintenance of synergies across the work packages.

To secure timely delivery of agreed inputs and services the partnership relies on committed team work between all DA and KNUST key resource persons, while in accordance with DFC's general conditions for BSU II it is KNUST as the South partner who holds the overall and final responsibility for prioritizing, coordinating, reporting on and managing the partnership. It is the KNUST anchor and project management support staff who act as the primary entry points for communication with DFC. And it is the KNUST project management teams' responsibility to establish the guidelines and manage facility for easy upload and access to relevant documents including all core BSU II KNUST and WP plans and reports from and for all key resource persons.

The WP teams (from DA and KNUST) will hold monthly meetings via Skype (or in Kumasi if the timing coincides with project activities), to assess progress according to their work plans and to adjust these where and whenever required. On a half-yearly basis these meetings will also serve the purpose to prepare the WP's input to the report to DFC that will be assembled and compiled by the project management support team. The Anchor team will have similar meetings quarterly to assess progress, and every half year to approve the financial and narrative reports before they are submitted to DFC.

At KNUST, the BSU II Project will be managed by a Steering committee (all KNUST staff listed below) and chaired by Prof. Robert C. Abaidoo) that reports to the Vice- Chancellor. The Steering Committee will have the responsibility for project implementation and financial management. The Project Management Committee will meet regularly to review and take major decisions especially in

connection with project progress, financial and procurement issues. The structure proposed is in tandem with KNUST's 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 staff participation with the view increasing the visibility of University female research and administrative staff in the delivery of the University's main products. The two lead institutions will sign a contract with clear terms of references that will also spell out conflict resolution mechanisms.

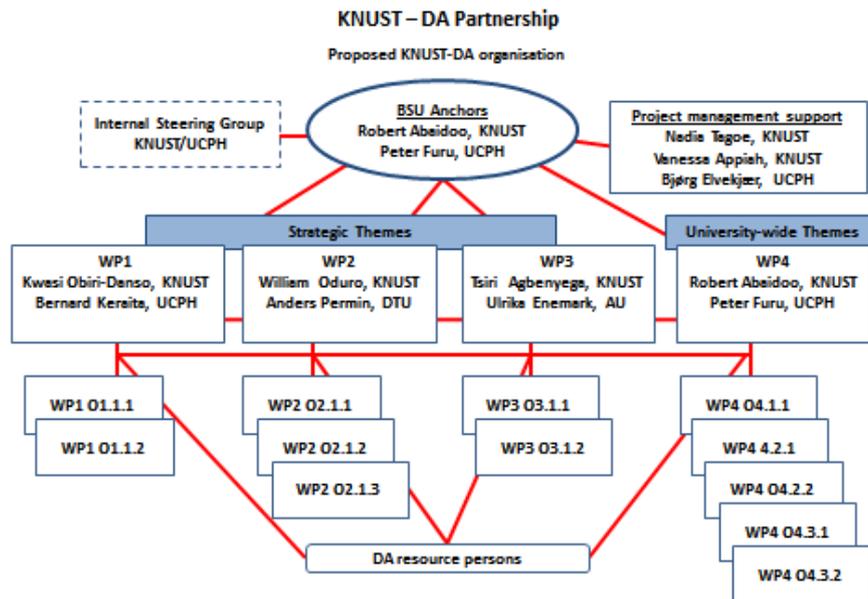


Fig 1. BSU II KNUST Management Structure

4. Risks and 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. 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 and partially resolved by the PhD scholarship and other interventions.
- **Delays in timely monitoring and reporting:** Programme support team providing timely guidance and reminders and WP leader teams responding accordingly.

5. Budget

Summary KNUST-DA Budget				
		KNUST	DA	Total
	Inception Phase	111870	306570	418440
WP1	CSAEM			
Output 1.1.1	Research Development	1595676	1256840	2852516
Output 1.2.1	PhD Program Development and Strngthening	120000	60000	180000
	Sub total WP1	1715676	1316840	3032516
WP2	JCE			
Output 2.1.1	Improved Skills in Research Development	1035673	832440	1868113
Output 2.1.2	PhD Program Development and Strengthening	134000	70000	204000
Output 2.1.3	Enhanced infrastructure for managing industry-academia relationship	352000	130000	482000
	Sub total WP2	1521673	1032440	2554113
WP 3	HDS			
Output 3.1.1	Staff Upgrading - PhD	601000	220000	821000
Output 3.1.2	Research Development	821673	812440	1634113
	Sub-total WP3	1422673	1032440	2455113
WP 4	University-wide services			
Output 4.1.1	Grant management services available to project management and support staff in the Colleges	867000	490000	1357000
Output 4.2.1	Improved access to online research publications and timely and effective library support services	732000	180000	912000
Output 4.2.2	Good Laboratory Practices (GLP) system in place and operational at new central laboratory	315000	221138	536138
Output 4.3.1	Improved skills in PhD research supervision and quality assurance	373253	215000	588253
Output 4.3.2	University-wide PhD courses institutionalized	302000	240000	542000
	Sub-total WP4	2589253	1346138	3935391
	WP Activity Totals	7249275	4727858	11977133
	Coordination cost (8 %)	579942	0	579942
	Overhead costs (12 / 20 %)	869913	945572	1815485
	DFC expenses	99000		99000
	External Audit	90000	20000	110000
	Total amount requested	9000000	6000000	15000000

6. Monitoring, Reporting and Auditing

Monitoring and reporting on the progress of the planned BSU II activities will take place according to guidelines and calendar defined by DFC <http://dfcentre.com/research/building-stronger-universities-bsu/inception-fase>

- **Annual report** – technical and financial (audited) – should be completed by April 1st 2015 and 2016, respectively. The project year and fiscal year runs from January-December.
- **Progress report** - technical and financial (non-audited) – should be completed by October 1st 2015 and 2016, respectively. This progress report will be on the activities, achievements and spending over the previous half year.
- **Final report** – should be submitted no later than 6 months after project completion, i.e. May 1st 2017.

Annexes:

Annex 1: Logical Frameworks

Annex 2: Work plans

Annex 3: Budget