



INNOTAL

**Integrating Talent Development into
Innovation Ecosystems in Higher Education**

586227-EPP-1-2017-1-BG-EPPKA2-CBHE-JP

**UNIVERSITY PRIORITY SETTING REPORT FOR THE PROVISION OF
RESEARCH AND EDUCATION**

AGRICULTURE AND FORESTRY UNIVERSITY, NEPAL

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Contents

Objective of the study	4
Review of national priorities for research, innovation and education	5
Agriculture, animal science and fishery	5
Forestry.....	10
University priorities for research and innovation targeted at the economy and business enterprises	12
Current areas for research, education and innovation	12
Research and education priorities	15
Potential expansion of existing research centres.....	16
Potential opening of new research centres	18
Potential expansion of collaborations with business or creation of new collaborations.....	20
Potential expansion of international collaborations or creation of new international collaboration.....	22
University priorities for research and innovation targeted at inclusive economic growth	24
Current areas of research, education and innovation	24
Priority areas for research and education	24
Potential expansion of collaborations or creation of new collaborations.....	25
University priorities for research and innovation targeted at pressing challenges facing societies in Southern and Southeast Asia.....	26
Current areas of teaching and research	26
Priority areas for teaching and research	27
Areas of innovation and research activities in which students should be involved.....	29



Objective of the study

The overall objective of this report is to map priority areas for research and education provision in Agriculture and Forestry University (AFU). It aims to provide a vision on how AFU could become innovation and skills provider for its region and locality, and how students and graduates should be involved in this process.



Review of national priorities for research, innovation and education

Agriculture and Forestry University has been focussing its teaching, research and extension activities on the areas of Agriculture, Animal Science, Veterinary Science and Forestry Science. It has also been trying to expand its working area on different cross-cutting dimensions like climate change, gender, rural studies, biotechnology, agribusiness, etc. Different national-level institutions are responsible for setting priority in these different sectors. These are dealt hereunder by sector.

Agriculture, animal science and fishery

Nepal Agricultural Research Council (NARC) was established in 1991 as an autonomous organization under “Nepal Agricultural Research Council Act – 1991” to conduct agricultural research in the country to improve the economic wellbeing of the people. Its objective is to conduct studies and research on different aspects of agriculture, to identify the existing problems in agriculture and to identify and propose solutions. Most importantly, it is the largest body to assist government in the formulation of agricultural policies and strategies . The Ministry of Agriculture and Livestock Development (MoALD) is the line ministry in charge of agriculture and livestock research, development and extension activities in the nation. It has given responsibility of research to NARC. Similarly, the Ministry of Education (MOE) is the apex authority to manage and control university education in coordination with the University Grants Commission (UGC). Agriculture and Forestry University (AFU) sets its research and innovation thematic area in close coordination with UGC, MOE, MOALD and NARC. Some thematic areas of agriculture, animal science and veterinary science are illustrated hereunder .

Crops and Horticulture

Theme 1: Improving crop varieties

- Germplasm collection, maintenance, and utilization of food, fibre, legume, fruits and vegetable crops
- Development of suitable high yielding varieties of major food crops such as rice, wheat and maize and minor crops such as millets, barley and buckwheat, through selection and hybridization to ensure food security



- Enhancement of productivity of oilseeds and winter and summer legumes with emphasis on tolerance to drought and other types of stress.
- Variety improvement of cash crops such as tea, coffee, cardamom, sugarcane, ginger and jute through selection and hybridization for enhancing quality production and productivity
- Generation and promotion of off-season vegetable- and floriculture-related technologies.

Theme 2: On-farm crop management and improvement of agronomic practices

- Developing integrated crop management, including integrated pest and water management, and integrated plant nutrient practices
- Developing cost effective integrated crop management package of practices
- Developing package of practices for organic farming
- Strengthening farm mechanization operations including conservation tillage
- Disseminating technology for quality seed and sapling production and management.

Theme 3: Marketing and value chain development

- Development and upscaling of postharvest technologies, including drying, processing and value addition techniques
- Generation of technology for value addition on Non-Timber Forest Products, including Medicinal and Aromatic Plants
- Studying national and international markets for exportable agricultural products, including quality demanded by the markets
- Reviewing the governments export policies and suggesting appropriate actions to increase the value of export.



Livestock and Fisheries

Theme 1: breed improvement and management

- Germplasm collection, conservation, maintenance and utilization of dairy, meat, eggs, wool, fiber, as well as animal, fish commodity, forage and rangeland species
- Sustainable conservation and utilization of domestic breeds of Nepal
- Enhancing productivity of dairy animals through selection and crossbreeding
- Developing meat-type buffalo
- Enhancing the productivity of sheep and goat through selection and crossbreeding for meat, fibre and milk (goat cheese) production
- Development of suitable crossbreed pig and poultry for value addition
- Enhancing fish productivity through increasing fish species diversity and integrated fish farming in ponds, lakes, running water and rice fields
- Development of suitable meat-type and wool-type rabbits for different agro-ecological zones of Nepal.

Theme 2: Fodder and feed management

- Development of around-the-year fodder production system for reducing the production cost of dairy animals
- Rangeland resource management through exploration of indigenous and scientific knowledge
- Improvement of locally available non-conventional feed resources
- Improvement of the productivity of fish through developing appropriate feeds and feeding management
- Nutrients fortification in mechanically compressed feed block.
- Promotion of integrated crop, forest, livestock and fisheries development



Theme 3: Animal health

- Enhancing animal productivity through prevention and control of economically important diseases. Surveillance and control of zoonotic diseases in strategically important locations
- Identification and exploitation of adaptive and disease resisting traits of indigenous animals
- Proper utilization of poisonous plants and ethno veterinary medicines.

Theme 4: Marketing and value addition

- Development and promotion of value adding technologies for import substitution and export promotion of dairy, meat, eggs, fish and wool
- Development of suitable fiber, meat & skin processing techniques for product diversification.

Natural Resource Management and Climate Change Thematic Area

Theme 1: Natural resource management

- Development of land capability classification and crop suitability mapping for various crops
- Development of conservation tillage practices to maintain soil health and improve water retention
- Identification and promotion of biological nitrogen fixing species to maintain soil fertility in agro-forestry systems
- Development of Sloping Agricultural Land Technology approaches to create a living barrier to sediments and gradually transform the sloping lands into terraced land
- Utilization of hydrological, land use, cropping system, soil loss, and water management models
- Development and promotion of technologies for rehabilitation of degraded land.



Theme 2: Mitigating climate change effects

- Estimation and development of mitigation measures of GHGs emission from agriculture and livestock
- Estimation of carbon sequestration under various agricultural practices and development of appropriate mitigation measures for GHG emissions
- Identification, development and promotion of climate-friendly agricultural technologies to adapt to climate change and contribute to sustainable agriculture development while maintaining agro-ecosystems and agro-biodiversity
- Development of methodology for the different agricultural crop areas and yield estimation before harvest to improve preparedness to extreme situations
- Increasing capacity within NARC and other partners through collaborative research and joint exploration of adaptation and mitigation options.

Biotechnology

Theme 1: Improvement of crops and horticulture

- Development of crop varieties/hybrids to address biotic and abiotic stress as well as quality
- Development of technologies through tissue and embryo culture to improve crop productivity
- Characterization of crop species/varieties at a molecular level for better utilization in breeding programs
- Increasing efforts in marker-assisted selection and developing diagnostic kits for breeders
- Transforming technology, such as golden rice, to feed the poor, while also supplementing vitamin A needs
- Assessing the diversity of indigenous crops.

Theme 2: Improvement of livestock and fisheries

- Assessing the diversity of indigenous livestock and fisheries to generate information for breeders, gene banks, and policymakers



- Developing and refining semen production technologies in livestock and fish
- Characterization and conservation of livestock and fish species at a molecular level
- Applying molecular marker (DNA) in genome mapping for marker-assisted selection in livestock and fish species
- Inducing polyploidy and cloning in exotic and native aqua-culture fish species
- Developing techniques for ova and embryo as well as other genetic material production.

Forestry

The Department of Forest Research and Training (DFRT) is the apex body under the Ministry of Forest in Nepal to prioritize and regulate research areas in the national forestry sector. It has set its priority areas of research as follows .

- Conservation and utilization of forest resources
- Private forestry, agroforestry and nursery management
- Forest business, SMEs in forestry, value addition and livelihood
- Forest biodiversity, soil and wildlife conservation
- Forest protection-major insects and diseases and management strategy
- Carbon and nutrient dynamics in soil and vegetation in different ecosystem types
- Soil, water and land use management
- Ethnobotany and livelihood in pro-poor communities
- Dendrochronological study of climate change
- Harvesting impacts on ecosystem
- Geological implication for natural resource management
- Floral diversity
- Litter analysis
- Wetlands ecology



- Water quality
- Runoff, erosion and sedimentation



University priorities for research and innovation targeted at the economy and business enterprises

This section identifies AFU's priorities for research and innovation aimed at assisting business to improve productivity, become more competitive and create higher value added good and services.

Current areas for research, education and innovation

In light with the national priorities, AFU has engages in research and innovation in the following areas:

- Agricultural business and policy analysis
- Livestock and fisheries research and extension to reflect user demand and the need to generate additional household income also through commercial scale of rearing
- Enhanced animal welfare and human-animal bond
- Medicinal and aromatic plants, their domestication, production and value addition, considering environmental issues and sustainability
- Increased agricultural productivity
- Cereals, grain legumes, horticulture, and forest crop research to reflect small to medium scale commercial farming and enhanced livelihood
- Cereals including rice, wheat, maize, millet and crops such as buckwheat, barley, oil seed crops, covering their productivity improvement for commercial purpose and sustainable use
- Plant protection measures
- Major fruit such as mango, apple, citrus, guava, litchi, pineapple; vegetables, both winter and summer vegetables, including guard, cucurbits and cole crops as well as seasonal flowers that have commercial value
- Fodder and feed production, cost and management
- Marketing of livestock, livestock product and value addition



- Increased productivity of indigenous species as adaptive factor against climate change
- Managerial manipulations for stress amelioration, specifically buffalo and exotic breeds
- Utilization of male buffalo calves as potential source of meat with respect to economy and quality
- Breeding related issues including inbreeding hazards and ways to overcome field-related problems
- Improvement of poor reproductive and productive performance of farm animals
- Disease identification and pathogen isolation (Mastitis, Tuberculosis, Brucellosis, Influenza, PPR, FMD)
- Risk analysis, impact and economic analysis of different farm diseases prevalent in Nepal (Avian Influenza, Mastitis, FMD, PPR)
- Scientific study of zoonotic important diseases of Nepal (Avian Influenza, Leptospirosis, Rabies, Anthrax, Cysticercosis)
- Molecular diagnosis of emerging and re-emerging diseases in Nepal
- Aquaculture production, productivity and livelihood with respect to different species and environment
- Small-scale fish farming leading to improved household nutrition and income
- Commercial fish farming – increased productivity and income
- Fish diseases and breeding
- Fish market and postharvest handling
- Forest business, SMEs in forestry, value addition and livelihood
- Forest protection – major insects and diseases and management strategy.

Some examples of major research projects carried out at AFU are:



Name of project	Funding source
Development of more efficient and environmentally sustainable aquaculture systems for Nepal	AQUAFISH INNOVATION LAB, USA
Participatory biodiversity and climate change assessment for IPM in the Chitwan-Annapurna landscape, Nepal	USAID
One Health Asia and ANSAB led projects in collaboration with RELIEF International.	ANSAB Nepal
One Health Epidemiology fellowship	Massey NZ
Pest Exclusion Nets project	Winrock International/USAID
Promotion of bio-fertilizers cum bio-pesticides for eco-friendly agriculture	GoN/NARDF
Aquaculture commercialization: Intensification of carp polyculture through commercialization	GoN/NARDF
Genetic diversity of Red Panda from Nepal Himalyan	USAID/WWF/Hariyo Ban
Genetic diversity of Swamp deer population from Shuklaphanta and Bardiya National Park	USAID/WWF/Hariyo Ban
AIP/DGGW	Sathguru consultant
Potential of youth and women's involvement in climate smart agriculture technology and service in Nepal	International center for Tropical Agriculture
Improving nutrition and productivity of buffalo (INPB) in collaboration with NARC and DLS	-USAID) / FTF-IL-ALCC/MSU
Introducing improved pasture management practices within community forest to address livestock climate change adaptation	-USAID) /FTF-IL-ALCC
Response of tomato (<i>Solanum lycopersicum</i>) on performance, carcass characteristics, immune response and hematological parameter of heat stressed broiler in Chitwan, Nepal	-USAID) / FTF-IL-ALCC
Action research on Agriculture Nutrition Extension Program (ANEP)	World Fish Bangladesh
Small farmer technology on polyculture	USAID/AQUA FISH



	Innovative Lab
Vulnerability of livestock farming system to impact of climate change in the Terai region of Nepal	NAST
Impact of climate change on cereal production and food security	NAST
Impacts of chemical pesticides on women farmers of vegetable pockets	Action Aid International
Research and development co-operation in alleviating poverty and malnutrition in the developing world through the increased production and consumption of nutritious and health promoting vegetables	USAID/AVRDC

Research and education priorities

Priority thematic areas for research and education of AFU are subject to change as per the policy set forth by the Research and Extension Council. Moreover, there is the requirement that such areas represent each and every discipline of Agriculture, Forestry, Animal Science, Veterinary Science, Fisheries and Social Sciences. The followings are the key considerations that have informed the formulation of priority thematic areas:

- Increasing the inclusion of small farmers, women and other disadvantaged groups, in view of improving their livelihood
- Increasing pluralism in agricultural research and development through increase in collaborative projects
- Ensuring sustainability of resource use
- Ensuring coherence with government policy and programs
- Ensuring teaching friendly and student-inclusive faculty research
- Following global trends
- Enabling action research

As a higher education institution, AFU is still in its infancy, with a history of less than a decade. However, the Directorate of Planning, the Directorate of Research and Extension and concerned faculties have already managed to put specific emphasis on some of the areas for



research and education. Thus, the most important areas of research and education that emerge from the broader priority areas are:

- Productivity and quality enhancement of agriculture, livestock, fishery and forestry to increase market competitiveness
- Cost, demand and supply analysis of agriculture fishery and forestry commodities
- Medicinal and aromatic plants, their domestication, production, value addition and trade
- Marketing of livestock; livestock product and value addition
- Increased productivity of indigenous species and their adaptation to climate change
- Managerial manipulations for stress amelioration, specifically for buffalo and exotic breeds
- Improvement of poor reproductive and productive performance of farm animals
- Disease identification, pathogen isolation and risk analysis of major animal diseases
- Small-scale and commercial fish farming leading to improved household nutrition and income
- Forest business, SMEs in forestry, value addition and livelihood

The main preconditions required for the strengthening of research in the university are increase in size of faculty and manage the research fund. Most of the faculties are young and they are overloaded in teaching with the ratio of Faculty: student at about 17. This release limited time as well for research. Similarly, AFU lacks provision of research faculties. AFU gets very negligible fund from the government on research purpose as NARC is the main recipient of research fund.

Potential expansion of existing research centres

AFU has been operating research facilities mainly under the Directorate of Research and Extension. This Directorate supports a veterinary hospital, a Faculty of Agriculture, a Faculty



of Forestry and a Faculty of Animal Science, Veterinary and Fishery. Currently, these divisions are operating with an insufficient number of research faculty members and smaller budget. Most of the faculty members are young. Relations with national and international donor organizations are also in beginner stage. AFU has established an Agricultural Science Centre in Palung, Daman, with a mandate to carry out location-specific research and extension. Agricultural Science Center, Palung was formally inaugurated by the Registrar of the Agriculture and Forestry University in 2017 and has now started functioning. The centre is located about 60 km east away from Hetauda Sub-Metropolitan City, Makawanpur. The Centre has been planned to function as a link between the University and stakeholders in agriculture, most importantly the farmers in Makawanpur district. It has the following prime objectives:

- Conducting on-farm testing to identify the location specificity of agricultural technologies under various farming systems
- Organizing field demonstrations to establish the production potential of various crops, livestock and forest enterprises on the farmers' fields
- Organizing needs-based training for farmers in order to update their knowledge and skills in modern agriculture, livestock and forest technologies. Trainings deal with technology assessment, refinement and demonstration. The Center also trains extension personnel to orient farmers in the frontier areas of technology development
- Creating awareness about improved technologies in the areas of natural resource management to support beneficiaries through appropriate extension programmes
- Producing and supplying good quality seeds and planting/genetic material, livestock, including poultry and fisheries products and various bio-products to the farming community
- Working as a resource and knowledge centre of agricultural technology in view of supporting the initiatives of the public, private and voluntary sector aimed at improving the agricultural economy of the district

The Agriculture Science Center, Palung functions under the Directorate of Research and Extension at AFU. It will be run by a coordinator and about five subject matter specialists



and technical experts, pending approval of the job positions by the government of Nepal. Currently, the activities of the Agriculture Science Center are to be performed by appointed Junior Technical Assistants, visiting faculty from AFU tasked with conducting research and extension, and other hired experts depending on the nature of the activities. The activities are to be monitored by the Deputy-Director of DOREX under the supervision of the Director of DOREX. The DOREX is to plan activities in consultation with the Vice Chancellor, Registrar, the Planning Directorate and Faculties' deans. The university has submitted to the Government of Nepal a proposal for a research budget for the Center, including budget for staff and capital construction. The proposal is in the process of approval. The work of this centre has commenced with the following initial functions:

- Soil testing and proposing remedies
- Plant clinic for identification of insects, diseases and proposing remedies
- Campaigns
- Demonstration plot with latest technologies for vegetable production
- Farmer field school for Integrated Pest Management (IPM)

All of the available research centres of AFU can be expanded in terms of size of staff, research assistants, research associates, advisory committee and investment volume. The following are the key areas of improvement:

- Making the necessary logistical arrangements
- Increasing the availability of skilled human resources
- Heightening attention to ethical consideration, including the development of ethical research manuals and guidelines
- Improving promotion and publication systems
- Engaging faculty members and students in research activities
- Establishing partnership with national and international institutions

Potential opening of new research centres

At AFU there is potential for opening new research centres in different faculties as branch units of the Directorate of Research and Extension, once the Directorate enters the stage of full development. Similarly, there is scope of opening more AFU Agriculture Science Centers



in different geographical region. The opening of three more such centers has already been approved by the Government of Nepal. AFU has eight branch colleges established in different parts of the country. Research cells can be established in all of these colleges to address location-specific issues. Besides addressing location specific issue these centres can contribute to regional-scale research to address deficiencies in knowledge. For example, the College located at Dhankuta, Pakhribhas and Rolpa can focus its research activities on subtropical and temperate commodities like tea, cardamom, Chauri (Himalayan cattle), herbal medicines, as well as the indigenous knowledge of people living in mountain areas. Similarly, the College located at Dhangadi may focus its research on regional and global issues such as dry land farming and climate change. The Agriculture College at Sindhuli and the Forestry College at Udayapur appear to be more prepared to carry out research on the application of agricultural and forest conservation technologies in the Chure Bhawar region of the country, which is an important region for water recharge for the Terai region in Nepal and India.

Expansion of research capacities at the University would require a lot of effort. Actions that will be needed include:

- Establishing field-level research stations
- Installing the necessary equipment in different laboratories
- Repairing and upgrading existing equipment
- Developing a catalogue of available equipment throughout the University for use by faculty members and students
- Training faculty members and support staff in working with modern technology
- Participating in seminars and conferences nationally and internationally
- Developing ethical guidelines for research conducted by students and faculty members
- Producing the necessary technical manuals for conducting research
- Training researchers in research ethics and the use of technical manuals
- Publishing an Annual University Journal
- Organizing seminars, conferences and colloquiums on research outcomes



- Sharing research outcomes through academic publications and online media
- Launching and operating a Knowledge Management Centre equipped with well experiences roster of expert from different disciplines to share knowledge, ideas and experience with students, teachers, administrative people and outside communities
- Conducting joint research activities with national and international research institutions and universities
- Establishing linkages with public and private institutions for research and development
- Organizing exchange visits at national and international research institutions.

Potential expansion of collaborations with business or creation of new collaborations

AFU's values demonstrate its long-term commitments towards creating an enabling environment for effective teaching, pursuing scholarly research and extension service to the society. These values guide the decisions the University makes, and how it engages with the communities locally and globally. The values to which the University gives a high regard are as follows.

- **Excellence:** AFU strives to maintain highest academic standards by delivering quality education to students, and engaging in research and extension activities to address the national and global problems
- **Inclusive development:** AFU embraces the people of all social and gender groups originating from diverse geographical regions as its members for upholding social justice and inclusive development
- **Partnership:** AFU adopts the approach of establishing local and global partnerships in addressing the emerging issues related to teaching, research and extension.
- **Good governance:** AFU recognises the significance of Good Governance for its overall operation
- **Innovativeness:** AFU focuses on innovations that find solutions to complex problems facing the broader human society



- **Leadership:** AFU instils into its faculty, staff and students the need to take the lead in teaching, research and extension and to engage in societal transformation.

Based on the above core values, the University can potentially increase its collaboration with different national organizations working in research, education and business. Some potential organizations for such collaborations are:

- Nepal Agriculture Research Council
- Ministry of Agriculture and Livestock Development
- Nepal Academy of Science and Technology
- Department of Industry
- Department of Cottage Industry
- Wood processing industry
- Poultry hatchery, feed and pharmaceutical industry
- Department of Marketing
- University Grants Commission
- Department of Agriculture
- Department of Livestock Services
- Floriculture Association of Nepal
- Tribhuvan University
- Prime Minister of Agriculture Modernization Project
- Non-Governmental Organizations
- International Non-Governmental Organizations

Research impact in different prioritized areas of teaching and research can be strengthened through the following interventions:

- Increasing the size of faculty, along with a separate provision of research faculty
- Capacity building of young faculty members



- Improving lab facilities
- Searching for more funding for research and teaching
- Increasing collaboration with international organizations like USAID, EU, JICA, GIZ, KOICA, WB, ADB, ICAR, CIMMYT, etc.
- Increasing collaboration with business
- Establishing an agribusiness incubation centre

Potential expansion of international collaborations or creation of new international collaboration

AFU maintains technical collaboration with about 50 international research centers, universities and business organizations. Collaboration is mainly targeted are student and faculty exchange, capacity building, research support, funding and development of technical guidelines. AFU hopes to be able to take full advantage of collaboration with these organizations in the near future. AFU is continuously expanding the process of collaboration with other possible organizations. Some examples of organizations with which AFU has collaboration are:

- Michigan State University, USA
- Louisiana State University, USA
- Colorado State University, USA
- Tennessee State University, USA
- National Pintung University, Taiwan
- Tokyo University of Japan
- Massey University, New Zealand

Some examples of collaboration for achieving the objective of quality research and extension are:

- Collaboration on curriculum development: with Nepal Agriculture Research Council, Ministry of Agriculture and Livestock Development, Himalayan University Consortium



- Collaborative research: with Nepal Agriculture Research Council, Michigan State University, Copenhagen University, Hiroshima University, Tuscia University, etc.
- Faculty and student exchange: with Tuscia University, Meishan College
- Infrastructure development: with Sathguru Foundation, India



University priorities for research and innovation targeted at inclusive economic growth

Current areas of research, education and innovation

- Food security and food safety
- Sustainable utilization of natural resources, including forests
- Indigenous knowledge on agriculture, livestock and fisheries
- Private forestry and nursery management
- Social inclusion
- Gender inclusion and feminization of agriculture
- Management issues of natural forests
- Forest fires and their impact
- Conservation and management of non-timber forest products; participatory forest management
- Ethnobotany and livelihood in pro-poor communities
- Agro-ecotourism

Priority areas for research and education

- Sustainable utilization of soil, plant, animal and fish resources
- Feminization of agriculture
- Gender role of remittance in agriculture
- Inclusion of socially disadvantaged and marginalized communities in economic activities
- Ethnobotany and livelihood in pro-poor communities
- Agro-ecotourism

Research capacity in this area should be strengthened, and the relevant actions and efforts are the same as mentioned in the previous section.



Potential expansion of collaborations or creation of new collaborations

The following efforts are being undertaken by AFU for expansion of collaborations:

- Developing institutional mechanisms for operating the University's research programmes, with the involvement of relevant stakeholders, including the potential users of research results
- Setting up field-based research stations in various strategic locations of the country to act as a link between the University (researchers, faculty members, students) and rural communities (in particular farmers and forest users) to meet the latter's research needs
- Strengthening the research capacity of faculty/researchers through appropriate short-, medium-, and long-term training and other capacity enhancing activities (e.g. participation in seminar, exchange visits, engaging in research activities in and outside the university system, etc.).
- Establishing and strengthening comprehensive infrastructures (physical, laboratory, library/resource centre, farm, IT and other on- and off-farm research facilities) for research activities
- Conducting basic and applied research activities, on its own or jointly with national and international research institutions, in the sciences (agriculture, animal, veterinary, aquaculture, forestry, etc.) and social sciences
- Establishing relations with national and international educational and research institutions for collaborative research activities and exchange programmes/visits
- Establishing linkages with the public and non-governmental sector development institutions in the country for research and development purposes
- Providing support for the research undertakings of the faculty and students
- Sharing the knowledge, innovation and technologies resulting from research at local and global levels through various types of publications and materials (e.g., Journals, Technical booklets/bulletins, Newsletters, CDs/DVDs, etc.), electronic media (Radio, TV, Websites, email, etc.) and other appropriate forums (organizing seminars and conferences).



University priorities for research and innovation targeted at pressing challenges facing societies in Southern and Southeast Asia

Current areas of teaching and research

- Clinical research for the benefit of animal health
- Infectious and zoonotic diseases of animals and humans
- Environmental issues relating to animal and human wellbeing
- Conservation Agriculture
- Resource Conservation Technology
- Organic agriculture
- Identification and development of stress-resistant crop varieties and livestock breeds
- Embryo and tissue culture
- Biodiversity assessment of crops, livestock and fishes
- Production and conservation technologies for ova, semen and embryo
- Climate change-impact, mitigation and adaptation of agriculture, livestock, fishery and forests
- Conservation and promotion of indigenous knowledge
- Ecosystem services
- Breed improvement and management
- Organic manure improvement methods for higher nutrient and environmental impact on the community
- Research on Food Safety (antibiotic resistance; food borne diseases; qualitative analysis of meat, milk, fish, egg and honey; analysis of national policies to best suit food safety)
- Aquatic diversity and management
- Conservation and utilization of herbal medicines
- Agro-forests



- Forest biodiversity, soil and wildlife conservation
- Carbon and nutrient dynamics in soil and vegetation in different ecosystem types
- Soil, water and land use management
- GIS application in natural resource management; soil survey and profile
- Dendrochronological study on climate change
- Floral diversity
- Litter analysis
- Hydrological analysis-hydrological cycle components
- Wetlands ecology
- Water quality
- Runoff, erosion and sedimentation

Priority areas for teaching and research

- Infectious and zoonotic diseases of animals and humans
- Environmental issues relating to animal and human wellbeing
- Conservation Agriculture
- Resource Conservation Technology
- Organic agriculture
- Identification and development of stress-resistant crop varieties and livestock breeds,
- Climate change-impact, mitigation and adaptation of agriculture, livestock, fishery and forests
- Aquatic diversity and management
- Carbon and nutrient dynamics in soil and vegetation in different ecosystem types
- Soil, water and land use management



- Runoff, erosion and sedimentation



Areas of innovation and research activities in which students should be involved

AFU has been offering bachelor, master and PhD programs in agriculture, animal science, veterinary science, fishery, forestry, agribusiness management and rural studies. These are the areas in which they can get involved in research. Students are not limited when they have to prioritize and select their concrete research topics. However, the factors mentioned below are affecting the areas under selection:

Budget availability: Students sometimes carry out their research on donor-driven topics, irrespective of the priorities of university.

Time availability: Bachelor-level students have one semester available for research and they are conducting research under Prime Minister Agriculture Modernization Project. Master and PhD students have more than one year available for research and are focussing on long-term projects in collaboration with their respective advisor and his/her research work.

Qualification and area of expertise of faculty: As stated earlier, AFU has a limited number of teaching faculty at different department. Most of the faculty members are young and do not hold a PhD degree. Capacity building and exposure of these faculty members to foreign universities and research centres can increase their efficiency in carrying out research in selected prioritized areas.

Research Infrastructure: The research infrastructure at the university is very old (it has been transferred from the Institute of Agriculture and Animal Science). It is also limited in terms of quantity. Students experience limitations and cannot select some areas of research due to the unavailability of lab facilities.

In spite of these limiting factors, about 200 post graduate students and 500 undergraduate students are currently involved in academic research activities with the support of the Ministry of Agriculture and Livestock Development, NGOs, INGOs, and the university's own internal funds mobilized from DOREX.

For students to get more involved in research, the following actions need to be undertaken:

- Providing small grants to students to conduct research
- Training students on technical skills necessary for conducting research



- Providing necessary logistical support to students to conduct research in collaboration with faculty members

Agriculture and Forestry can provide the following research opportunities for students:

- Providing small grants to students to conduct research for master level students
- Providing opportunities for Master-level students to get involved in research implemented by faculty members funded from the Directorate of Research and Extension
- Involvement of undergraduate students in data collection and processing for field and survey research

Students should be given more opportunities for meeting and working with external stakeholders. For example, the following opportunities should be utilized:

- Presentation of research findings and academic progress to local stakeholders during anniversary ceremonies
- Discussion with local stakeholders from the Municipality, the Metropolitan City, the Chamber of Commerce and Industry, the Agriculture Office, the Forest Office, etc., in the frame of technical workshops, meetings and symposiums.



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