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Prospects of Establishing a Land-Grant University Model: Policy Paper on the Agriculture and Forestry University of Nepal

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Agriculture and Forestry University

Office of the Vice Chancellor

Chitwan, Nepal

Date: April 19, 2019

Preface

It is my great pleasure to write a few words on the publication of policy document—"*Prospects of Establishing a Land Grant University Model: The Agriculture and Forestry University of Nepal.*" I would like to congratulate all the authors who have contributed to this policy paper. I am pleased to acknowledge the pivotal role of Dr. Rebecca J. Williams, from the Feed the Future Innovation Lab for Livestock Systems, University of Florida, USA and Prof. Naba Raj Devkota, AFU, Nepal for their tremendous editorial contribution for this publication along with all other concerned stakeholders who took on the critical responsibility of bringing this document into shape.

The role of the Agriculture and Forestry University (AFU) in present Federalist Nepal is based on the demand for higher level human resource production, appropriate technology development to enhance agriculture productivity, food and nutritional security, and the development of the forestry sector in the country. At present, what AFU has been practicing and doing its best, being based on existing Act is questionable from several perspectives in terms of execution and settling with its property hand-in process from Tribhuvan University. Thus, the AFU Act needs to be amended as per the spirit of the constitution of Nepal 2015. AFU must be legally defined as a Central University with total autonomy in management and operation of the university. AFU is expanding its constituent colleges in different states and thus all three level of Government (Federal, Province and Local) should contribute towards strengthening financial resources for proper functioning and operation of the university.

The institutional relationship of AFU with Nepal Agricultural Research Council (NARC), Department of Agriculture (DOA), Department of Livestock Service (DLS) and Department of National Parks and Wildlife Conservation (DNPWC) should be clearly defined and the relevant policies should be formulated accordingly. Since AFU is the centre of Academic and Research activities for agriculture, livestock, fisheries and forestry, the Government of Nepal should support the strengthening and capacity building of faculties to develop innovative ideas and to contribute meaningfully to the science in these disciplines. AFU must play a leading role in coordinating agricultural and livestock research within the country and should extend networking and collaborative mechanisms among the related stakeholders including international research organizations, institutions, and the universities.

An integrated approach to extension is needed to deliver information and education and to sustainably empower the rural agricultural workforce in Nepal. Agriculture graduates should be supported to self-employ and become innovative entrepreneurs.

I am confident that these policy paper recommendations on agriculture and forestry education will be a guideline for strengthening AFU in the production of quality graduates. In addition, concerned stakeholders across the globe will find it useful in their planning and policy formulation process, especially in relevance to the overall development of the natural resources sector of Nepal.

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1. Introduction

On November 26, 2018 the Agriculture and Forestry University (AFU) of Nepal hosted a workshop on *National Agriculture and Forestry Education Policy in Nepal*. In 2010 the Government of Nepal through its parliament Act gave AFU the title of Land Grant University with a research, teaching, and extension (RTE) mandate. Despite the responsibilities outlined in the Act, the current policy structures and funding mechanisms are not sufficient to allow AFU to fulfilling its mandate beyond the teaching arm. The purpose of this workshop was to bring together diverse stakeholders to discuss policies and institutional relationships related to the land grant mandate of the university. The workshop served as a platform to develop a reference policy document for Government of Nepal to aid in understanding of these challenges and to improve the functioning of the university system under the new mandate. During this workshop four policy papers were presented written by Professor Dr. Kailash Nath Pyakuryal, charter Vice Chancellor of AFU; Professor Dr. Moha Dutta Sharma AFU; Dr. Bishnu Raj Upreti, AFU/Director of Nepal Center for Contemporary Research (NCCR), Kathmandu, Nepal; and Professor Dr. A.K. Das, Senator and Adjunct Professor of Faculty of Forestry, Hetauda, AFU. A paper on the United States land-grant university model was presented by Dr. Adegbola Adesogan, Director of the Feed the Future Innovation Lab for Livestock Systems and Professor of Animal Sciences at the University of Florida. This paper integrates the ideas from these policy papers and the discussion points from the 80 workshop participants to present a policy paper on the issues facing AFU in fulfilling its Research, Teaching and Education (RTE) mandate. This paper is intended as a compilation of summary impressions for reference among policy makers and AFU stakeholders.

2. Background

In Nepal, approximately 60 percent of the population depends on agriculture for their livelihood. Agriculture in Nepal contributes one-third of the total national Gross Domestic Product (GDP) and has been identified as a priority sector for the economic development of the country. Globally, it has been proven that agriculture plays a crucial role in reducing poverty and achieving economic growth and development. However, according to the Global Food Security Index (2013), Nepal has a low level of food security, ranking 84th out of 107 countries. There are several interrelated factors responsible for poor agricultural performance including low productivity of major cereals and livestock species, narrow and selective production base and trade structures, limited modern agricultural knowledge, poor infrastructure, and inadequate institutional and policy frameworks. In addition, Nepal is facing significant societal changes including rapid urbanization, increasing competition for water and electrical resources, and a shift from a food exporting country to a food importing country. These changes increase the pressure on the agricultural industry to meet the demands for nutritional food consumption.

Strong agricultural infrastructure and resource allocation to produce high quality research, extension, and human resources is a pre-condition to address these challenges. Developed countries in the global north achieved rapid growth in agricultural productivity in second half of the 20th century, due mainly to public and private investment in agricultural research and development (R&D). Developing countries have heavily relied on knowledge and technology spill-over from agricultural research undertaken by developed countries. However, the hegemonic approach of the developed countries (e.g., extraction of genetic resources and patenting, development of genetically modified organisms and terminators technologies, sanitary and phyto-sanitary provisions, and unfavourable trade rules) does not meet the unique needs and demands facing under-resourced developing countries. The rise of modern biotechnology and enhanced Intellectual Property Rights (IPR) regimes means that technologies that were once freely accessible will be less accessible in the future. International biotechnology companies are limiting incentives to develop technologies suitable for less-developed countries. When the national research capacity is weak, international research agencies become dominant.

Nepal is a nation with widely varying ecological zones, tremendous biodiversity, and unique niches of production systems. The diversity in Nepal is blessing of opportunity, but also presents challenges that make borrowing or transplanting technologies from developed countries, a significant barrier. This requires the country of Nepal to conduct research, development, and education activities that will initiate its own innovations that are appropriate for the Nepali context. With these issues in mind, it is the right time for Nepal to invest in agriculture research for developing capacity to innovate new agricultural technologies that will meet the need of the Nepali people.

In Nepal, agricultural development is often seen as a priority among decision makers. However, investment in agricultural research, as in many developing countries, is not as well prioritized by decision makers. Lack of agricultural investment in developing countries is in part because research and development (R&D) requires a long period between initial investment and the achievement of positive returns. When agricultural research is funded, it is typically a narrow focus without proper attention to the entire value chain and system approaches, as well as human resources, market, climatic, geographical and cultural needs. Additionally, there is a lack of capacity of individuals and institutions engaged in research. Enhancing the capacity of agricultural research, education, and extension requires attention at the highest political and policy decision levels.

Countries who have advanced in agricultural productivity indicate that investment in agricultural research and innovation, integration of research into academic programmes, ensuring responsive institutional arrangements, establishing conducive legal provisions, and the allocation of adequate resources to develop competent human resources must be in place to address the internal and external barriers to agricultural development. However, Pardey et al. (2006) highlight that developing countries are facing serious funding, governance, and institutional constraints that inhibit the effectiveness of agricultural research, leading to food shortages and hunger. These challenges are echoed in Nepal, pointing to the need for dedicated research funding and good governance in developing agricultural technologies.

Nepal's agricultural sector needs to boost investment in agricultural research in order to reduce poverty, improve the livelihoods and wellbeing of farmers, enhance agricultural productivity without deteriorating the environment, and to contribute to trade promotion and macroeconomic development. It is essential to produce competent human resources capable of conducting theoretically grounded, methodologically sound and pragmatically relevant research that paves the way to modernize and commercialize agriculture including livestock and other natural resources. Nepal's agriculture sector must also improve market access, ensure effective dissemination of research findings, and develop a strong legal framework to establish a robust research platform.

3. Structural change and decentralization

Drastic political changes have recently occurred in Nepal. Constitutionally, Nepal is now a Federal Democratic Republic, organized into seven provinces, 77 districts and 753 local levels (six Metropolises, 11 sub-Metropolises, 276 Municipalities and 460 Rural Municipalities). The 2015 Constitution of Nepal now guarantees the people's right over land, natural resources, and to food and agricultural resources (Articles 25, 36, 40, 51). As part of the restructuring in Nepal, district-level agricultural offices have been restructured into Agriculture Knowledge Centres, Veterinary Hospitals, and Livestock Expert Centres (particularly to serve as referral unit and to coordinate the Local and Federal government), and agricultural development activities have been now handed over to local governments. However, the majority of farmers report that past service delivery activities have stopped with no functional alternative.

Agricultural education was brought under the university system during the 1970s. It has produced numerous graduates who serve the nation, but performance in the agriculture sector has not improved in a visible way. At present,

agricultural extension, research and education are conducted by three separate institutions. Under the Ministry of Agriculture and Livestock Development (MOALD) are the Department of Livestock Services (DLS) and the Department of Agriculture (DOA) who are responsible for extension services, whereas the National Agricultural Research Council (NARC) is responsible for research. Under the Ministry of Education, Science and Technology (MOEST) is AFU which is responsible for agricultural education. There are weak horizontal linkages between the research, extension, and education services provided by these institutions.

4. Investment in Agricultural Research and Development (R&D)

Globally, spending on R&D reached 1.7 trillion USD in 2018. *Table 1* shows the top 10 countries gross investment in R&D, collectively accounting for 80 percent of the worldwide investment. Nepal is not included in the list as it failed to invest the minimum amount of 50 million USD which serves as the main criteria for inclusion. Nepal has allocated only 0.4 percent of its annual GDP to research in all areas. Nepal is similar to many developing countries who have not internalized the role of research in their countries, nor have they allocated the resources required to conduct meaningful research.

Table 1: Top 10 Countries' Investment in R&D

Country	Investment in R&D (USD billion)
1. United States	552.98
2. China	474.81
3. Japan	186.64
4. Germany	116.56
5. South Korea	88.23
6. India	83.27
7. France	53.12
8. Russia	58.62
9. United Kingdom	49.61
10. Brazil	37.45

In Nepal, the government has allocated an estimated 6 percent of the total national budget to agriculture, forestry, fisheries in the year 2016/17. This is inclusive of all activities under this heading which also includes significant allocation to tourism activities in these sectors. When scrutinizing the budget more closely, only 2.56 percent of the total budget is allocated to agriculture research and development funding in Nepal, amounting to approximately 33 billion Nepali Rupees (NRs). However, an estimated minimum of 50 billion NRs. is required to meet the needs outlined in the country's Agriculture Development Strategy (ADS). The MOALD budget allocation to the NARC is less than 10 percent of the total MOALD budget. Funding allocation for universities, including AFU, is conducted through the MOEST-University Grants Commissions (UGC). Out of the higher education budget, 90 percent is allocated to Tribhuvan University, and the other 10 percent is allocated to the other nine public universities. In total, less than 7 percent of this budget is allocated for research, which as discussed above, is primarily used for administrative and management costs. The budget allocations for both MOALD and the allocation of funds by MOEST demonstrates the lack of importance placed improving agricultural productivity and systems in Nepal, despite agriculture being the primary source of livelihood of the Nepali people.

In recent decades, many universities in South Asia are aspiring to convert agricultural universities to a land grant model to improve agricultural research and the linkages between education, research, and extension services. This includes Nepal, where in 2010 AFU was given a land grant mission by the Nepali parliament. However, the feasibility of such efforts and the willingness of political decision makers to adequately support conversion to the land grant model is still an issue of intellectual and political debate.

5. The Land Grant Models

There are two dominant models of the land grant system. The first was developed in the United States (US) and focuses on the role of universities in research, teaching, and extension. The second model was developed in the Netherlands and focuses on the role of Wageningen University and Research in teaching and research. In the latter model extension is privatized.

The US land grant system evolved over 156 years to its current highly successful tripartite mission of teaching, research, and public extension services. The US land grant system is a legalized and institutionalized provision in which the federal government provides state owned land to build a college or university for the agricultural and mechanical arts. The model provides the legal scope and financial resources to establish agricultural experiment stations in conjunction with each of the land granted universities. It also forms the basis of the Cooperative Extension System in which the county, state, and federal governments partner to disseminate knowledge from the university researchers to the end users such as farmers and entrepreneurs. The main principle of land grant model includes complete integration of education, research and extension services, accessibility of practical agricultural education to both rural and urban youths, and research and discovery in the interest of farmers and other stakeholders.

The land-grant model enables researchers and scientists to take an integrated, systems approach in advancing agricultural knowledge and research. The connections between research, extension, and teaching provide benefits such as the integration of innovations and technological advances into curriculum and the provision of practical skills training. There is also a continuum from basic to applied research which allows for unique advancements in the field while still meeting the needs of farmers and ranchers. This includes the transmission of advances in the laboratory to field trials and on-farm trails. This relationship also and works in the reverse with farmers and livestock raisers/herders bringing their issues directly to the university for guidance on how to solve the problems. The universities under the land grant model are also the primary sources of policy inputs to the US government in terms of agricultural research, education, and extension services (Cordova, 2005). The universities under the land grant model are expected to play an important role in policy and public debate including providing objective, science-based evidence to help inform decision-makers; serve as honest brokers in public debate; and to act as a clearinghouse to evaluate and disseminate information to the public (Cordova, 2005).

While the US land grant model has been very successful, it requires significant inputs including land and resources for conducting research and developing demonstration farms, support for research activities including infrastructure and funding, and the establishment of strong relationships with the teaching arm of the university and with the public sectors. This model has successfully been established in India, Pakistan, and the Philippines. An example of successful restructuring to the land grant model can be seen in India, where the responsibilities for higher agricultural education, research, extension and the entire field of agricultural and veterinary sciences were transferred to Indian Council of Agricultural Research (ICAR) in 1965. The state agriculture universities of India are now autonomous organizations with state wide responsibility for agricultural research, education and extension (Singh et al. 2013). ICAR has transformed the fields of education, research, extension and making the country self-reliant, hunger-free and food-secured.

The model developed in the Netherlands combined the teaching focus of Wageningen University with research institutions that formerly fell under the Ministry of Agriculture. The merger of Wageningen's teaching arm and the various agriculture and livestock related research centres occurred between 1997 and 2010 and resulted in the institutionalization of Wageningen University and Research (WUR). The merger of these institutions in combination with the legislative structure and policies guarantee that WUR can conduct independent research in combination with their higher education programs. Like the US land grant system, the WUR system is funded by the federal government. While WUR does conduct some professional development training; extension services were largely privatized in the Netherlands beginning in 1990. To date, most extension services are fee-based and even the Dutch Ministry of Agriculture is a paying client.

The WUR land grant model has been highly successful in the Netherlands and WUR is ranked as the top agriculture university in the world. Unlike in the US model where there are multiple land granted university institutions located throughout the country, WUR is the only public agriculture university in the Netherlands. Like the US model, WUR requires significant inputs to support both the teaching and research arms of the institution. Importantly, the success of the privatization of extension services in the Netherlands depends on the strength of private industry and public/private partnerships. As extension services are largely a paid service, the quality of extension services must be high for farmers and ranchers to see the added value in purchasing these services.

6. The Role of the Agriculture and Forestry University in Nepal

In 2010, the parliament of Nepal passed a bill to establish AFU as the first land grant technical university in the country (AFU Act, 2010). According to this Act, the constituent campuses of Tribhuvan University, the Institute of Agriculture and Animal Science (IAAS), Rampur Campus, Rampur and the Institute of Forestry (IOF) in Hetauda were merged and the Agriculture and Forestry University was created in Rampur, Chitwan. AFU was established with the aim being a pre-eminent land-grant model university for building Nepal into a food secure, economically vibrant, environmentally sustainable, and socially equitable nation. The mission of AFU is to improve the quality of life of the people of Nepal through agriculture, including livestock and fisheries, and forestry education, research and extension. AFU is tasked with producing competent human resources to promote education, research and development in agriculture, livestock and veterinary, fisheries, forestry and allied disciplines. AFU is a state-funded university mandated with the three functions of teaching, research and extension.

In its operational plan (2012), AFU aims to provide thought leadership to Nepal's agricultural and forestry research and development. However, the current structure of AFU and the government funding priorities and mechanisms only support the teaching arm of the mission. Research activities at AFU are minimal and dependent on the small amount of research funding from UGC. The research mandate of AFU comes in direct conflict with mission and activities of NARC who is funded by the MOALD. Extension and outreach at AFU are not explicitly funded and there are currently very limited activities in this area. The extension mandate of AFU comes in direct conflict with the mission and activities of the Department of Agriculture (DOA) and the Department of Livestock Services (DLS) who currently provide government extension services in the country. These issues result in inter-institutional conflicts over resources, funding, priorities, and relationships. For AFU to fulfil its mandate, fundamental restructuring of the policies, infrastructure, relationships, and missions of AFU, NARC, DLS, and DOA is required.

7. Recommendations from the National Agriculture and Forestry Education Policy in Nepal Workshop

The following sections describe a set of recommendations, action points, and policy discussions that must occur to strengthen the connections between agricultural teaching, research, and extension in Nepal, with particular focus on the role and mandate of AFU. These recommendations stem from the National Agriculture and Forestry Education Policy Workshop in Nepal. The workshop included the presentation of four policy papers and an open stakeholder discussion. A total of 80 participants attended the workshop including AFU charter faculty, current faculty and staff, agricultural entrepreneurs, former secretary of MOAD, current government representatives, UGC chairperson, representatives from the Nepal Veterinary Council, and guests from the University of Florida (UF) and the United States Agency for International Development (USAID).

The following recommendations are not exhaustive, but rather are intended as a starting point for discussion on the policies related to agricultural teaching, research, and extension and the role of AFU as a pre-eminent land-grant

institution in Nepal. This may also serve as a reference document to the planners and policy makers in the country. The primary recommendations from the workshop are to- a) clarify the laws that establish the role of AFU, b) restructure the existing institutional arrangements to clarify the roles and responsibilities of AFU, NARC, DLS, and DOA, c) establish the role of AFU as an agricultural land-grant institution and the appropriate land-grant model to meet the needs of Nepal, d) develop the appropriate regulatory bodies, and e) establish government support of public-private partnerships to bolster research and extension. Each of these recommendations is discussed below.

7.1. Clarify laws

Revision of the articles of the Agriculture and Forestry University Act (2010) is needed to clarify the roles and responsibilities of AFU and to ensure the university's ability to fulfil its mandate including the vision and mission. The provision of the "autonomous status" of AFU in Chapter 2 article 4 is narrow and must be detailed to allow for the autonomy of AFU in management and operation of the university. The amendment must also include provision of a "Directorate of Extension Services" with a clear legal mandate for extension including defining the operational relationship between AFU, DLS, DOA, and the government's recently created Agriculture Knowledge Centre, Veterinary Hospitals, and Livestock Expert Centres. The role of research at AFU (Chapter 7, Article 15) must be expanded and include clarification of the role of AFU in relation to provincial agricultural institutions, research centres, and NARC. In addition, the relationship and associated roles between these institutions and the research and extension centres/stations currently in operation must be clarified.

In addition to the issues described above, the current debate between TU and AFU in terms of handing over property and employee recruitment profile/data base must be resolved, also considering the provision of forestry education. Even though IOF, Hetauda Campus of TU has been moved under AFU in the Act, Tribhuvan University (TU) has refused to hand over its forestry campus in Hetauda to AFU and is continuing student enrolment for the B.Sc. in Forestry. This has resulted in AFU and TU running the same program on the same premises and sharing the limited facilities. The redistribution of resources from TU and AFU must be enforced, allowing for AFU to take full responsibility for the provision of the forestry program in Hetauda.

7.2. Establish the role of AFU as an agricultural land-grant institution in Nepal

As the first land grant model university in the country, the government must clarify AFU's modality in terms of education, research and extension services. History shows that university-based research under the land grant structure provides a mechanism for technology transfer, the flow of research output from the laboratory to the farmer's field, or to private enterprises for modernization and commercialization of the agriculture sector. By establishing a land grant model, there are ample opportunities for a continuum of basic research to applied research to outreach, that will ultimately address challenges faced by the agriculture sector. While there are many potential benefits to the land grant system, the appropriate land grant model must be determined per the unique needs in Nepal and formally established through the Nepali parliament. The modality of AFU as a land grant institution must be concretely established through debate and discussion among stakeholders, decision makers, and planners.

The RTE model discussed above is appealing because of its unprecedented success in the US. A similar system in Nepal would place AFU as the "central" university for agriculture and forestry, providing leadership and guidance for the establishment of other similar institutions within the federal system. Implementation of this model would require research and extension branches in provinces, and potentially at local levels. It would require the engagement of local provinces and governments in terms of priorities, funding, and operation. This model provides wide coverage but is operationally more complicated in terms of management, efficiency and rendering scientific impacts. The RTE model requires the government to provide land and resources in provinces for research and extension and legally binding

institutional arrangements for collaboration or integration with other institutions, such as NARC, DOA, DLS, and the recently established Agriculture Knowledge Centres, Veterinary Hospitals and Livestock Expert Centres in the districts. The US model also requires a collaborative funding relationship between the provinces, districts, and the federal government.

The teaching and research model employed at Wageningen University and Research in the Netherlands has been highly successful in terms of human capacity development and research outputs. Implementation of this model in Nepal would place AFU as a “federal” university where there would be no affiliated or branch campuses. This model would allow for high quality research and education. As this model does not include the extension component, it is administratively less complicated with a smaller number of administrative authorities and institutional arrangements and does not require the direct engagement of local provinces. However, this model does not address some of the priority issues in Nepal such as the weak research-to-extension linkages and the lack of community engagement in setting research priorities

A major issue to the establishment of AFU as a land grant university is the provision for establishing constituent colleges and affiliated private colleges within the resource intensive needs of the land grant model.

The constituent colleges are separate colleges running the same academic programs under any Faculty (*viz*: Agriculture; Animal Science, Veterinary Science and Fisheries; and Forestry) at different locations around the country. The affiliated colleges also run the same academic programs and award degrees under the evaluation and monitoring of the university, but the funding and management are through private entities. The government of Nepal has mandated AFU to establish constituent colleges across the country. However, AFU is not sufficiently structured or funded to fulfil its established mandate on its three faculties, whether it is the case of Rampur, Chitwan, or Hetauda, Makawanpur. The addition of colleges and affiliates puts additional pressure on the already insufficient resources allocated to AFU.

In addition, it has been recently discovered that some states in Nepal are independently working to establish science and technology universities inclusive of livestock education. However, these institutions are not dedicated solely to the agriculture and NRM sectors. It is not yet clear under what modality these institutions will operate and how this influences AFU's role as the sole land-grant institution in Nepal. The land grant model requires significant inputs including land, farms, animals, laboratories and equipment, human resource development, and more. Thus, the government of Nepal should adopt an appropriate land grant model and should be cautious of allowing AFU and other universities to recognize constituent or affiliated colleges unless they also fulfil the criteria of the land grant model.

Whichever model is established by the government, there must be clearly defined laws, appropriate institutional arrangements, and substantial resources allocation. Both land grant models require a) conducive policy, b) responsive institutional structures, c) favorable regulatory provisions, e) adequate resources (funding, land, inputs), and f) public ownership. A meaningful, informed, constructive debate about the restructuring of the AFU is required from a wide range of stakeholders. These discussions must include debate on the:

- (a) Legal act and regulations
- (b) Institutions (governing structures, human resource management, norms, procedures, values, culture of practice, international relations; funding mechanism and regular support),
- (c) Policies (vision, focuses, priority, resources, linkages, coordination and collaboration)
- (d) Partnerships and collaboration with international institutions and organizations,
- (e) Integration of education-research-extension linkages with appropriate focus on the modality
- (f) Thematic orientations (subject areas, research themes, procedures and implementation).

7.3. Restructure existing institutional arrangements

Regardless of the land grant model that is implemented at AFU, restructuring of institutional arrangements will be required. The existing institutional arrangements between actors in agriculture in Nepal are not conducive to the research, teaching, and extension needs in the country. NARC is an independent and autonomous organization responsible for agricultural research. DOA and DLS are responsible for agricultural extension including livestock and animal health in Nepal. AFU is the higher education institution responsible for producing highly skilled human resources in the field of agriculture, animal science, veterinary science, forestry and fisheries. These three institutions function independently and separately with no mandatory horizontal and vertical linkages between them. This results in weak alliances and compliances in terms of producing quality human resources and determining research priorities, and extension services. Restructuring of these institutional arrangements is required for Nepal to progress in these areas. The best model for restructuring will depend on the political will and interests of actors in parliament and the current line ministries.

One suggested model requires combining the mandates of NARC, AFU, DOA, and DLS to form a single comprehensive system. The MOEST in Nepal is ill equipped and lacks the required knowledge to handle agricultural higher education in general and technical education in particular. As such, under this model AFU would be moved from under the auspices of the MOEST to the MOALD. The research mandates of AFU and NARC would be merged to bring research and education under one umbrella. AFU and NARC would be required to collaborate to develop a comprehensive plan to combine research and education, inclusive of the activities of the research centres throughout Nepal. Similarly, the extension mandates of AFU, DOA, and DLS must be combined or aligned to ensure direct connectivity between research and extension priorities and activities. As NARC, DOA, and DLS have stations and farms throughout Nepal, a combined system would allow for these resources to be leveraged for both research and extension activities. A comprehensive restructuring to bring agricultural RTE under one umbrella has significant policy, strategic planning, financial, and administrative challenges. *Figure 1* shows a comprehensive RTE model with horizontal linkages in which each institution would remain independent, but with overlapping and comprehensive plans and resources for research and extension. *Figure 2* shows a comprehensive RTE model with vertical linkages in which each institution would combine to form a single institution with multiple arms, similar to the US or WUR systems.

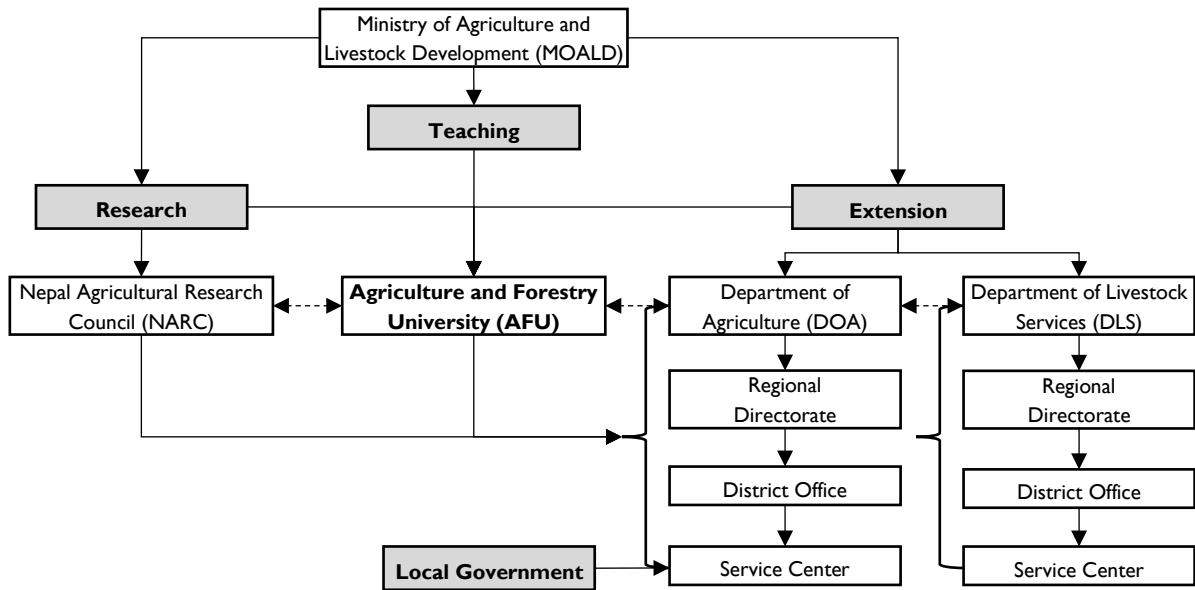


Figure 1: Comprehensive RTE Model of Institutional Relationships with Horizontal Linkages

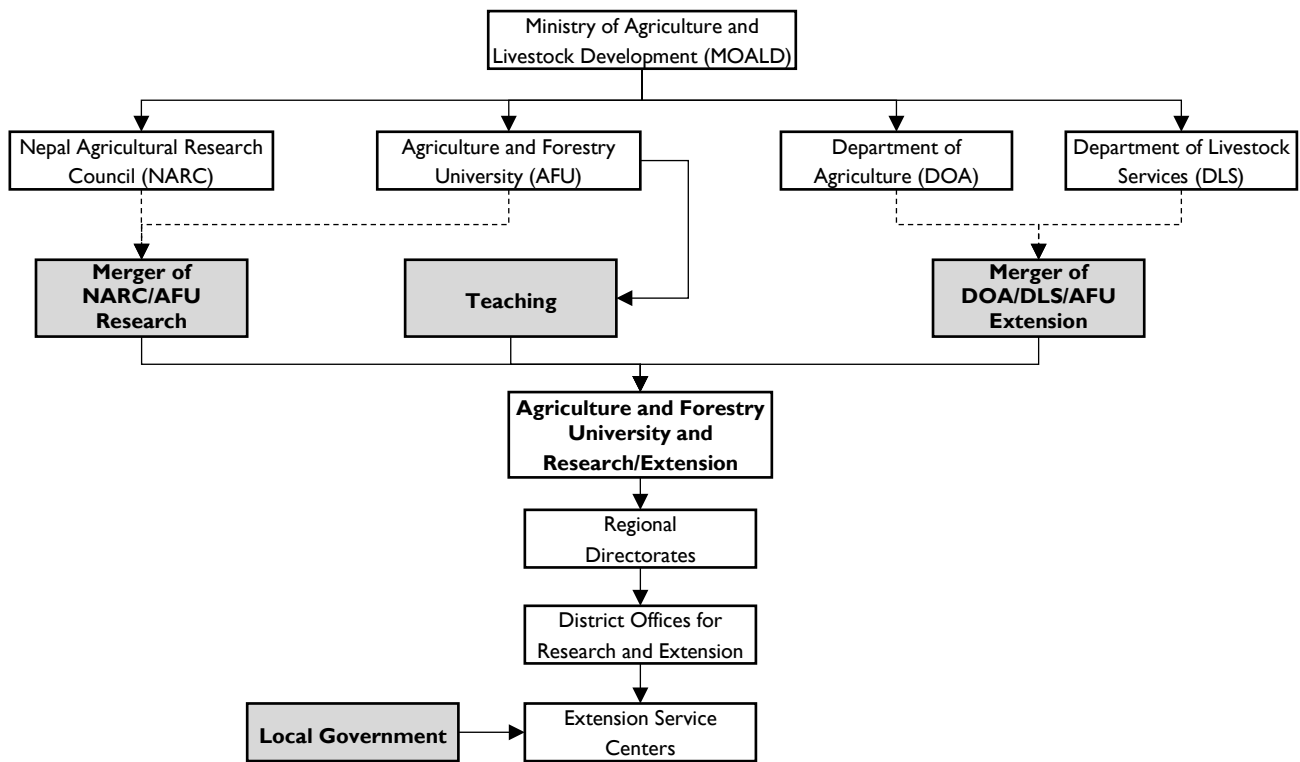


Figure 2: Comprehensive RTE Model of Institutional Relationships with Vertical Linkages

Another suggested model is to keep AFU under the auspices of MOEST, but clearly define and illustrate the policy and legal framework that dictate the roles, responsibilities, and funding for the various agencies responsible for RTE. This would require a clear framework for how AFU will collaborate with NARC to conduct research activities including research priorities, resources, and collaborative relationships. It would also require a clear framework to

clarify AFU's role in extension and how they fit in with the activities of DOA and DLS. Restructuring without moving AFU under the MOALD will come with its own significant challenges including funding mechanisms through the separate ministries, the development of memorandums of understanding (MOUs) between the various agencies, and the challenges associated with cross-ministry and cross-agency collaboration.

Finally, the ability of AFU to provide extension services throughout Nepal is a matter that must be clearly discussed and determined. Even when partnering with DLS, DOA, NARC, and providing more resources to AFU, provision of extension services throughout the nation may be unrealistic. As such, AFUs role in federal extension may be limited to certain districts or municipalities, with provisions for research and education to be more widely disseminated through other modalities. Despite the modality that is chosen, it is first important to set up the combined mandates of the relevant institutions so that AFUs mandate and the linkages between research, teaching, and extension are clearly demarcated.

7.4. Development of appropriate regulatory bodies

Given the number of actors involved in the agriculture, livestock, and forestry sectors, the development of appropriate regulatory bodies to oversee and monitor the activities related to RTE will be an important component of restructuring.

The number of higher education institutions, academic programs and students' enrolment are increasing every year in Nepal. Several constituent and affiliated colleges of AFU, Tribhuvan University, Purbanchal University and Far Western Universities are also conducting programs in agriculture and forestry sciences. In addition, a significant number of students are travelling abroad for higher education in these disciplines. The quality assurance and accreditation of programs has been recognized as an important oversight of higher education. In 2013 Nepal established a Quality Assurance and Accreditation Committee (QAAC). The QAAC is responsible for quality assessment and accreditation of higher education programs and institutions in Nepal. The purpose of such a regulatory body is to improve the quality of education and to ensure that the academic programs in Nepal meet international standards.

Nepal, as a member of World Trade Organization (WTO), has an international obligation to enhance the quality of agriculture and forestry services through the provision of skilled human resources. To ensure the standard of agriculture and forestry education in the provision of human resources for agriculture and forestry services, a regulatory body for Nepali agriculture and forestry council must be established. A Nepal Agriculture and Forestry Council (NAFC) would be the highest government organization responsible for ensuring the standards and quality of human resources (including education delivery) and services in the sector. The purpose of such a regulatory body would be to compliment the activities of the QAAC in order to ensure that the human resources developed through the academic system met the demand and needs of the agriculture, livestock, and forestry sectors. In addition, a NAFC would be responsible for harmonizing research standards and research platforms among the various actors, and to ensure that the academic, research, and extension systems follow the master plans set forth by the government.

7.5. Establish government support of public-private partnerships for agricultural innovation

Regardless of the mode of land grant model (with or without extension services), the Nepali governments must establish support of public-private partnerships (PPPs) to bolster both research and extension systems. It is estimated that only 5 percent of the world's agricultural extension services are provided by private institutions. Emerging middle-income countries such as Brazil, India, Columbia and Mexico have re-structured their policies to encourage private sector participation in agricultural research and development. In countries such as India and China, public

extension systems have been decentralized to the district and county levels, while in the US, the private sector has taken a lead in disseminating knowledge and new technologies. China has recently adopted a new unique hybrid model of agricultural extension in the form of a PPP which has been found effective.

The importance of PPPs in agriculture is understood in terms of a shared mechanism among the partners for inputs, resources, market development, risk management, and technology development. Many studies on PPPs focus on agricultural biotechnology, bio-safety regulation, intellectual property rights and technology transfer in support of developing countries. PPPs also have a positive impact on increasing access to higher education. In Nepal, PPPs can be effective in the promotion of more specialized academic programs, supporting the development of means of production, the promotion of entrepreneurship development, and to enhance commercial agriculture in Nepal.

8. Conclusions

Currently, AFU is not able to meet its role as a pre-eminent land grant university with a research, teaching, and extension mandate. The current funding structures, policies, and institutional arrangements come in conflict with the mandate given to AFU and their relationships with other actors who are conducting similar activities – particularly NARC, DOA, and DLS. If Nepal is to become a food secure country, the role of AFU in research and extension must be clarified and supported at the policy and institutional level. This document outlines several recommendations for discussion by stakeholders in agriculture, livestock, and forestry. These recommendations are not exhaustive but are a starting point for important discussions and debates that must occur if AFU is to meet its mandate. Furthermore, this document provides information for stakeholders, policy makers, and planners to understand the current challenges that AFU faces and changes that must occur for AFU to meet its legal mandate. The recommendations put forth in this document include:

- (a) Clarify the laws governing the roles and responsibilities of AFU, NARC, DOA, and DLS.
- (b) Establish the role of AFU as an agricultural land grant institution in Nepal including the model that best meets the needs of the Nepali people, the changed structure of the Nepali governments, and the institutional arrangements as they currently exist or will be changed.
- (c) Restructure the existing institutional arrangements between AFU, NARC, DOA, and DLS according to changes in policies and the established role of AFU as a land grant institution.
- (d) Develop the appropriate regulatory bodies to oversee the quality of research, teaching, and extension activities in Nepal.
- (e) Establish government support of public-private partnerships and how this can contribute innovation and extension in agriculture, livestock, and forestry.

9. Bibliography

- ADS. (2012). Preparation of the Agriculture Development Strategy (ADS). Kathmandu, Nepal.
- AFU. (2012). First Senate Meeting of Agriculture and Forestry University. Kathmandu, Nepal.
- AFU. (2015). Strategy (2013-2023). Agriculture and Forestry University, Rampur, Chitwan.
- AFU. (2015). AFU Operational Plan 2015-2020. Agriculture and Forestry University (AFU), Rampur, Chitwan.
- APROSC. (1995). Feasibility Study of University of Agriculture and Forestry Sciences in Nepal. Agricultural Projects Services Centre (APROSC), Ramshah Path, Kathmandu, Nepal.
- Beck U. (1992). Risk society: Towards a New Modernity. London: Sage Publications.
- Brown, Lester, and Brian Halweil. (1998). Worldwatch Institute China's Water Shortage Could Shake World Grain Market, April 22, 1998.
- Conway G. and Waage J. (2010). Science and Innovation for Development. London: UK Collaboration for Development Sciences.
- Cordova F. A. (2005). The Land Grant Model: A Lesson from the past, an investment in the future. China Agricultural University (16 September 2005) (key note address by Vice Chancellor of California University System).
- Coulson A. and Bitrina D. (2012). Improving the contribution of Agricultural Research to Economic Growth: Policy Implications of a Scoping Study in Tanzania. London: International Growth Centre.
- Council, N.R. (1995). History and Overview of the Land Grant College System. In Colleges of Agriculture at the Land Grant Universities: A Profile. The National Academics Press, Washington, DC.
- Evenson, R. E. (2002). In Handbook of Agricultural Economics, B. L. Gardner, G. C. Rausser, (Eds.). New York: Elsevier, vol. 1A, chapter 11.
- FAO. (2002). The role of Agriculture in the Development of least Developed Countries and their integration into the world Economy, Role: FAO: Rome.
- FAO. (2010). Agricultural Extension Services Delivery System in Nepal. FAO: Rome.
- Gauchan, D. (2012). Agricultural Development in Nepal: Contribution to Economic Growth, Food Security and Poverty Reduction. Socio Economic Development Panorama, Vol. 1, No. 3(2008) pp. 49-64
- Ghose, B. (2014). Promoting Agricultural Research and Development to Strengthen Food Security in South Asia. International Journal of Agronomy. Volume 2014, Article ID 589809, P.6
- GON. (2018). Program Budget. Ministry of Finance, Sigh Durbar, Kathmandu.
- Gulati, A., Sharma, P., Samantara, A. & Terway, P. (2018). Agriculture Extension System in India Review of Current Status, Trends and the Way Forward.
- Hadorn G.H., Biber-Klemm S., Grossenbacher-Mansuy W., Hoffmann-Rien H. J.D., Pohl C, Wisemann U, Zemp E. (2008). The emergence of transdisciplinarity as a form of research. In: Hadorn GH, Hoffmann-Rien H, Biber-Klemm S, Grossenbacher-Mansuy W, Joye D, Pohl C, Wisemann U, Zemp E, editors. Handbook of Transdisciplinary Research, Pp. 19-39. <http://dx.doi.org/10.1155/2014/589809>
- Hurni H., Wiesmann U., Ronald S., (Eds.) (2004). Research for Mitigating Syndromes of Global Change. Berne: University of Berne.

- Institute of Food and Agricultural Sciences, UF. (2019). Land Grant and Sea Grant: Events Leading to the Establishment of Land-Grant Universities. <https://ifas.ufl.edu/events-leading-to-the-establishment-of-land-grant>.
- Julian M., Jason A., Beddow M. and Pardey, P. G. (2009). Agricultural Research, Productivity, and Food Prices in the Long Run. *Agriculture Policy Forum*. www.sciencemag.org SCIENCE Vol. 325. P4 September 2009.
- Kashem, M.A. (2013). Challenges in Higher Agricultural Education in Bangladesh. *Progress. Agric.*, 24, 8.
- Kattel, R. & Sapkota, M. (2018). Brain drain of agriculture and veterinary graduates to abroad; evidence from Nepal. *Agriculture and Food Security*, 7.
- Lele U., Jules, P., Eugene T., and Eduardo T. (2010). *Transforming Agricultural Research for Development*. Rome: The Global Forum for Agricultural Research (GFAR)
- Martin, M.V. (2001). The Land-Grant University in the 21st Century. *Journal of Agricultural and Applied Economics*, 377-380.
- Mathema, K.B. (2007). Crisis in Education and Future Challenges for Nepal. *European Bulletin of Himalayan Research* 31.
- Mgaiwa, S. & Poncian, J. (2016). Public-private partnership in higher education provision in Tanzania: implications for access to and quality of education. *Bandung: Journal of Global South*, 3.
- Michel C, Stöckli B, Upreti BR, Wiesmann U. (2013). Research partnerships: the benefits of North– South Collaboration. *Evidence for Policy Series, Global Edition, No. 15*. Bern, Switzerland: NCCR North-South
- MOAD. (2016). *Agriculture Development Strategy (ADS) 2015-2035*. Vol 1. Government of Nepal, Ministry of Agriculture Development, Singh Durbar, Kathmandu.
- MOF. (2018). *Economic Survey*. Ministry of Finance, Singh Durbar, Kathmandu.
- NAAS. (2005). *Redefining Agricultural Education and Extension System in Changed Scenario*.
- Oliver, D.E. (2004). Higher Education Challenges in Developing Countries: The Case of Vietnam. *International Journal of Educational Policy, Research and Practice*, 5.
- Pardey, P. G., Alston, J. M. and Piggott, R. R. (Eds.) (2006). *Agricultural R&D in the developing world: Too little, too late?* Washington, DC: International Food Policy Research Institute.
- Paudel, S., Gill, T. & Rajotte, E. (2013). *Agriculture Education and Trainings (AET) System in Nepal: Present Status, Challenges and Future Priorities*.
- Ponnusamy, K. (2013) *Impact of public private partnership in agriculture: A review*. *Indian Journal of Agriculture Sciences*, 83, 6.
- Pyakuryal, Kailash. (1975). *Agriculture Development in Nepal (in Nepali)*. Pragma. Year 5, Volume 1. Royal Nepal Academy, Kamaladi, Kathmandu.
- Regmi, Punya P. (2007). *Proposal to establish the Agriculture and Forestry University (unpublished)*.
- Rahman, M. A. (2017). *United States Land Grant Model: Lessons for Developing Countries*. *Journal of Arid Agriculture & Vegetable Gardening* <http://aridagriculture.com/2017/09/19/united-states-land-grant-college-of-agriculture-lessons-for-developing-countries/>
- Lynam, J.; Beintema, N. M.; Roseboom, J.; and Badiane, O. (Eds.). (2016). Chapter 15. Pp. 401-422. Washington, D.C.: International Food Policy Research Institute (IFPRI). http://dx.doi.org/10.2499/9780896292123_15

- Sharma, K. & Bhandari, N. (2005). Review of Agriculture Extension System in Nepal. In National Agriculture Extension Workshop, Department of Agriculture.
- Singh, K., Meena, M. & Swanson, B. (2013). Role of State Agricultural Universities and Directorates of Extension Education in Agricultural Extension in India.
- Songkaeo, T. & Yeong, L. (2016). Defining Higher Education Issues and Challenges in Southeast ASIA/ASEAN within the International Context.
- Spielman, D., Hartwich, F. & Von Grebner, K. (2007). Sharing science, building bridges and enhancing impact: Public-private partnerships in the CGIAR. IFPRI Discussion paper 708.
- UGC (2013). Quality Assurance and Accreditation for Higher Education in Nepal. Kathmandu, Nepal.
- Upreti B.R. (2011). Research partnerships and capacity development in the South: A social learning perspective. In: Wiesmann U., Hurni H., (Eds.); with an international group of co-editors. Research for Sustainable Development: Foundations, Experiences, and Perspectives. Perspectives of the Swiss National Centre of Competence in Research (NCCR) North-South, University of Bern, Vol. 6. Bern, Switzerland: Geographica Bernensia. Pp. 73-90.
- Upreti B.R. (2012). Linking research with policy: Experiences and lessons from South Asia. Evidences for Policy Series, Regional edition South Asia, No. 6, ed. Bishnu Raj Upreti. Kathmandu, Nepal: NCCR North-South.
- Upreti B.R. (2012). Research for Development: Concepts and Orientation. SAS RCO Discussion Paper. Kathmandu: NCCR North-South, South Asia Coordination Office (SAS).
- Upreti B.R., Zimmermann A. B., Debele, B. and Cisse G. (2012). Partnerships in Development-oriented Research: Lessons Learnt and Challenges Ahead, Kathmandu, South Asia Regional Coordination Office of the Swiss National Centre of Competence in Research (NCCR North-South).
- Upreti, B.R. (2012). Research partnership in South Asia: Learning and Lessons. SAS RCO Discussion paper-4. Kathmandu: South Asia Regional Coordination Office of NCCR North-South.
- Upreti, B.R. (2013). Environmental Security and Sustainable Development (Chapter 12). In: Rita Floyd and Richard Matthew (Eds.) Environmental Security: Approaches and Issues. London and New York
- Williams, R.J. (2018). AFU Human and Institutional Capacity Development Gap Analysis: Summary Report and Recommendations. Gainesville, FL, USA: Feed the Future Innovation Lab for Livestock Systems.
- World Bank Group, Nepal, 2011. Moving Up the Ladder; Poverty Reduction and Social Mobility in Nepal.



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