

Assessment of agricultural education institutions in Nepal

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ABSTRACT

Nepal has experienced one hundred years of formal education in agriculture science. However, there is a dearth of information about agricultural universities and colleges in Nepal. This study explores the current status of agricultural universities and colleges in Nepal and the relevance of the Land-Grant University model. Literature review, key informants survey, and focus group discussion were the data collection methods for the study. Agriculture and Forestry University, was established in 2010 as a specialized technical university in Nepal, is in its expansion phase. However, Tribhuvan University has already produced nearly 15,000 agricultural graduates. Nepali universities and colleges enroll about 2000 undergraduate and 356 postgraduate students in agricultural science each year. Besides, the Government of Nepal has been launching agriculture programs in the school curriculum to motivate youth in agri-entrepreneurship. Nevertheless, students' enrolment and new program initiation are not based on human resource planning. There are many problems in the agricultural education system, including curriculum updates, students' and faculties' affiliation with political parties, and lack of functional linkage with governments, research stations, and private sectors. For the best management of existing problems, the community-based Land-Grant model could be the option. The Land-Grant model functions as an umbrella system to meet the tripartite mission of teaching, research, and extension advisory services for farmers and accept the agriculture ministry as a liaison ministry both in Nepal's provincial and federal government.

Keywords: Land-Grant University, college, AFU, IAAS

INTRODUCTION

The history of agriculture runs parallel to that of humankind, which is about 10,000 to 15,000 years ago (Lamb and Smithson, 1996). In the last couple of centuries, farming practices grew up gradually that helped people to settle from nomadic life (Merkle, 2013; Thrall *et al.*, 2010). Agriculture in Nepal employs about 60 per cent of the nation's population (MoAD, 2018). For many Nepali, agriculture is religion; for instance, good food production, and it is more than a commercial business in its broadest sense. To the poor, it is a life, an agent of continuity and change, and a means to cherish nature. Nevertheless, to the rich people, it is the main source of prosperity (Fuglie *et al.*, 2020; Tomich *et al.*, 2019; Khadka, 2010).

For 100 years, Nepal has invested to improve education in agriculture science. However, there is a dearth of information about agricultural universities and colleges in Nepal. This paper explores the current status of agricultural universities and colleges in Nepal. Another

objective of this research paper is to find the problem of agriculture education and the relevance of the Land-Grant University in Nepal. This study focuses on agriculture education though universities under study were also running animal science and veterinary science courses.

It is realized that agricultural education helps to increase productivity and access to modern agricultural technologies (Chaudhary and Pasa, 2015). The first attempt to modernize agriculture in Nepal was started by sending a few Nepali students to India to study agricultural science. The first Agriculture Office (AO) was opened in the Kathmandu district of Nepal in 1921 (Dongol, 2017), later upgraded to become the Department of Agriculture (DoA) in 1925. At that time, agricultural education was within the Government System of Nepal. Thus, AO also served as an educational institute with the mandate of teaching and training. Later, it was brought under the Tribhuvan University (TU), the oldest university of Nepal (CNAS, 2019).

METHODOLOGY

This research used qualitative methods of data collection. Key informants survey and focus group discussion were conducted with the Agricultural Students, College Principals, Professors, and Academicians in Nepal to collect data during 2020. The perception and experiences shared by agricultural professionals were used to describe the situation of agriculture education in Nepal. Besides, literature and university website were used to collect the information. Finally, the collected information were tabulated and described to explore the status of agriculture education in Nepal.

RESULTS AND DISCUSSION

Agricultural Educational Institutions in Nepal

Literature revealed that, in 1952, Agricultural Training Center was established in Kathmandu to train agricultural technicians (Bowers, 1953). Later, the DoA established a School of Agriculture to train Junior Technical Assistant (JTA) and Junior Technician (JT) in 1957. The School of Agriculture got upgraded to a College of Agriculture in Pulchowk, Lalitpur, in 1968. Then it started to train JTs, a two-year technical program known as Intermediate of Science in Agriculture (I. Sc. Ag). With the introduction of a 'new education

system' in Nepal, the College of Agriculture was promoted to the Institute of Agriculture and Animal Science (IAAS). In 1972, the IAAS was brought under the TU system.

It had been realized that an institute that teaches agriculture science would be more suitable in another part of the country than in Kathmandu. Thus, the IAAS was relocated from Kathmandu to Chitwan Rampur in 1974. The IAAS started its Bachelor of Science in Agriculture (B. Sc. Ag.) and Animal Science (B. Sc. Animal Science) in 1977 and 1987, respectively. Later, B. Sc. Animal Science was phased-out. In 1993, the Bachelor of Veterinary Science and Animal Husbandry (B. V. Sc. and A. H.) was introduced. Before the establishment of Agriculture and Forestry University (AFU), the IAAS, with its branch campuses in Lamjung and Paklihawa, have been instrumental in producing agricultural graduates in Nepal.

Council of Technical Education and Vocational Training (CTEVT) was established to train the middle-level human resources in 1989. Then, TU/IAAS in Nepal stopped producing JTAs and JTAs (CTEVT, 2019). Brief information about the present scenario of agriculture programs in CTEVT technical schools of Nepal is presented in Table 1 (MoEST, 2017).

Table 1
Present scenario of CTEVT technical schools in Nepal

Diploma Program	Diploma level institutions	Students enrolled diploma level	TSLC program	TSLC level institutions	Students enrolled TSLC level
Animal Science	16	640	JTA Animal Health	3520	3520
Agriculture Science	46	1840	JTA in Plant Science	5324	5324
Forestry	5	200	Textile and Sericulture	40	40
Food Technology	2	88			
Agriculture program	69	2768		8884	8884

(CTEVT= Council of Technical Education and Vocational Training; TSLC= Technical School Leaving Certificate; JTA= Junior Technical Assistant)

Stakeholders realized the need for Agriculture University and started to lobby to establish since the 1990s. As a result, Agriculture and Forestry University (AFU) was established in 2010 in Rampur, Chitwan, after twenty years of consistent efforts (AFU, 2019). Moreover, Kathmandu University Agriculture Program, Mid-western University-Institute of Agriculture and Forestry, Agricultural University in province number two, and Nepal Army Institute of Agricultural Science are Nepal's newly established agriculture education institution. Further, the government of Nepal is still endeavoring to establish a deemed to be university under Nepal Agricultural Research Council (NARC).

The Government of Nepal (GoN) has been launching the agricultural program in school level education. The government has included agriculture subjects in the school curriculum with the implementation of the 'School Sector Reform

Plan' from the Ministry of Education. The first phase of program was initiated in 2009 to 2015, and currently, it is in the second phase from 2016 to 2022. It has also been planned to transform 1000 ordinary schools into model schools after all the required improvements related to technical education (MoE, 2016; MoE, 2009).

Agricultural Human Resources Produced by Nepali Universities

Constituents and privately affiliated campuses of several universities provide agricultural education in all the newly established provinces of Nepal. As the basic aim is to increase expert for agricultural development, a yearly increase in private college affiliation is observed. The oldest institute, TU, has produced around 15,000 undergraduates and postgraduates as agricultural human resources in Nepal, presented in Table 2 (IAAS/ TU, 2019).

Table 2
Agricultural human resources produced by Tribhuvan University in Nepal

Type of human resources	Number
Social mobilizer and village animal health workers	2600
Non-academic JTAs in agriculture and animal science	2000
Academic JTAs in agriculture	4000
I. Sc. Ag. (I. Sc. Proficiency Certificate)	7000
B. Sc. Ag. Graduates	3961
B.V. Sc. and A. H. graduates	540
Postgraduates (M. Sc. / Ph. D.)	885
Total	14686

(JTA= Junior Technical Assistant; I.Sc. Ag.= Intermediate of Science in Agriculture; B.V.Sc. / A.H.= Bachelor of Science in Veterinary Science/ Animal Husbandry; B.Sc. Ag.= Bachelor of Science in Agriculture; M.Sc = Masters of Science; Ph.D. = Doctor of Philosophy)

In comparison for Bachelor's degrees with other universities from TU (458 students per year), yearly enrollment of agriculture graduates at AFU, all together on its constituent and affiliated colleges, is 837 students. Similarly, Purbanchal University (PU), and Far Western University (FWU), consecutively intake 288 and 100 students every year (FWU, 2019; PU, 2018). Besides, Kathmandu University (KU) has also started to enroll students, whereas as Mid-Western University announced admission call for 2022 session.

On other disciplines, AFU has the sole responsibility of recruitment under the Fisheries division, producing 15 students yearly (AFU, 2019). Similarly, B.Sc. Horticulture and Floriculture program has been launched under TU, in Mahendra Ratna Multiple Campus, Ilam, to produce 30 students per year (IAAS, TU, 2019). The number of yearly intake students for bachelor and master degrees in those universities is given in Table 3.

Table 3
Student numbers enrolled in bachelor and master's degrees annually (2018/2019) in Nepal

Degree	Universities				
	AFU	TU	PU	FWU	Total
Bachelor					
Agriculture	737	458	288	100	1583
Veterinary Science and Animal Husbandry	50	40	96	-	186
Fisheries	15	-	-	-	15
Horticulture and Floriculture	-	30	-	-	30
<i>Sub-Total</i>	802	528	384	100	1814
Master					
Agriculture	119	72	-	-	191
Animal Science	33	16	-	-	49
Veterinary Science	48	24	-	-	72
Fisheries	6	8	-	-	14
Agribusiness	-	-	30	-	30
Sub total	206	120	30	-	356
Total	1008	648	414	100	2170

(AFU= Agriculture and Forestry University; TU= Tribhuvan University; PU= Purbanchal University; FWU= Far Western University)

Similarly, on an average 10 Ph.D. scholars get graduated per year in Nepal (AFU, 2019). It is estimated that TU/IAAS has produced about 25 Ph.D. graduates. Post Graduate Program at IAAS/TU was started in 1998/99 (TU/IAAS, 2003) and has produced 25 Ph.D. graduates to date, roughly. Furthermore, hundreds of agricultural students graduated from the United States of America (USA), Australia, India, China, New Zealand, Thailand, and many other countries. This indicates the increase in an already vast pool of agricultural human resources. With newly established educational institutions, it is estimated that 2000 students enrolled in Bachelor in Agriculture degree each year in Nepal.

Constituents and Private Agricultural Colleges in Nepal

The IAAS/TU has already given affiliation to four private colleges and four constituent campuses in Nepal, as presented in Table 4. However, AFU is expanding its constituents' colleges compared to other universities without

proper planning. To date, AFU has eight constituents' colleges that offer Bachelor's degree in Agriculture. So far, AFU has already given affiliation to six private campuses in different provinces and is still prone to increase in number (AFU, 2019; AFU, 2015). So, the underlying threat is more possibility of quantity outweighing quality, which might leads inept agricultural professionals. The target of providing good quality technical education for all citizens by the Government of Nepal improving agriculture universities and colleges has been mentioned under target 4.3 of Sustainable Development Goals (UNDP, 2019). If rapid and random private affiliation strategy of university continues, fair education system may be challenged.

Discussions with agriculture education experts revealed that political leaders who influence the government have inadequate knowledge of how an agricultural university should operate and how much and what kind of resources it would need to run efficiently. Nepal needs to learn the example of the USA to improve the agriculture sector by

implementing the Land Grant University and College system (Nepali, 2018). To respond to these challenges, Nepal also has the opportunity to learn from Indian experiences since they also followed the Land Grant system of the USA (Mehta *et al.*, 2017).

Table 4
List of IAAS/TU and AFU constituent and affiliated campuses in Nepal

SN	Tribhuvan University	
	Constituent Campus	Affiliated Campus
1	Rampur Campus, Chitwan	Agri. and Ani. Science Community Campus, Baitadi
2	Lamjung Campus, Lamjung	College of Life Sciences, Dang
3	Pakhlihawa Campus, Rupandehi	Prithu Technical College, Dang
4	Gauradaha Agricultural Campus,	Mahendra Ratna Multiple Campus, Ilam
	Agriculture and Forestry University	
	Constituent Campus	
1	Central Campus, Rampur Chitwan	
2	College of Natural Resource Management, Kaski	
3	College of Natural Resource Management, Kailali	
4	College of Natural Resource Management, Sindhuli	
5	College of Natural Resource Management, Dhankuta	
6	College of Natural Resource Management, Mahottari	
7	College of Natural Resource Management, Rolpa	
8	College of Natural Resource Management, Dailekha	

Source: (www.afu.edu.np; www.iaas.edu.np)

Problems of Agriculture Education in Nepal

There are serious existing internal and external problems in Nepalese universities, institutes, and colleges. For example, course curriculums are not updated timely; the teaching of agriculture has not been adequately linked with practical activities. The case is even worse in the COVID-19 pandemic. Besides, there is poor communication among private, international non-governmental organizations (I/NGOs), government, and research institutes to the colleges and universities. Moreover, politically affiliated student groups and even faculty strikes for political motives have entirely weakened the competency of the institutions (Pykurayal, 2018).

The handover of TU property located in Rampur, Chitwan, to AFU is still a major issue that has been continuing from the initial year of its establishment (Rimal, 2016). Universities, institutes,

and colleges are affected by political activities. Regular exams, classes, and administrative activities have been badly affected by frequent political strikes and disputes related to student unions and other stakeholders in different issues (The Himalayan Times, 2019). Key informants survey with agriculture colleges principals and deans revealed that the newly established colleges in remote areas face hard times to run academic programs. As a result, students participation in the entrance examination for the agriculture program is gradually decreasing.

Land Grant Model University System

Basically, two types of land grant systems, one is the United States of America (USA) based emphasized on the relation among teaching, research, extension and another was developed in Netherland where extension was privatized and university focuses on teaching and research.

Wageningen University is one of the best examples of the land grant model used in the Netherland. The USA-based land grant system received land, financial resource to build the university, establish research station and cooperative extension services from the government. These Land Grant Model Universities suggest to develop agricultural policy for the US government. In addition, they are expected to take lead role on dissemination information to the farmers (Pyakuryal *et. al*, 2019). USA-based land grant universities have been very successful; however, it demands inputs including land and money to conduct research and develop demonstration plots, so as to make strong linkage with the teaching arm of the university and the farmers. Countries like India, Pakistan, and the Philippines have successfully adopted this model (Singh *et al.*, 2013). Wageningen-based land grant model's success is due to the privatization of extension services in the Netherlands, where synergy exists among public and private sectors.

In Nepal, agricultural extension, research, and education are theoretically conducted by three separate organizations: the Ministry of Agriculture, Nepal Agricultural Research Council (NARC) and Universities, respectively, which do not have any functional linkages in reality (Parajulee, 2017). Provincial and local governments of the new federal structure are also focused on agricultural extension service.

Land Grant system, which was established by the Morrill Acts in the USA, is still relevant in the newly established federal context of Nepal. This relevancy is largely due to the tripartite mission of these universities: teaching, research and extension advisory services for farmers (Martin and Hipp, 2016). The USA government during the 1960s supported many governments in South Asia after its successful implementation of Land Grant Model. With the support, India developed universities in the Land-Grant Model, whereas Nepal opted for assistance to the government, not to the university. During this period, India got the opportunity to educate its young agricultural scientists in the USA and got their universities established in Land-Grant

Model (Pyakuryal *et. al*, 2019). Examples of these kinds of universities in India are Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakhand, India (GBPUAT, 2019). Land-Grant Model Indian universities worked on improving the crops, developed varieties of wheat and rice during the 1970s, and India enjoyed the Green Revolution.

Universities in Nepal have no clear mandate for research and extension. In the Land-Grant Model, universities and colleges need sufficient land for practical, research, demonstration farms to exhibit successful agro-enterprises among the farmers. On the one hand, AFU wants to be established as Land-Grant University, whereas, on the other hand, it is providing affiliation to private colleges without considering research and extension approaches. However, the establishment of AFU-Agriculture Science Center (ASC) in Palung, Gorkha, and Dhading districts are crucial steps to give a flavor of Land-Grant University system (AFU, 2015).

At the Land-Grant University system, research findings are timely incorporated in the course curriculum, and shared during the teaching. Research works and students practical give opportunities to the faculties and the students to familiarize themselves with the farmers' problems, which become research themes for post-graduate level students and faculty members (NASULGC, 2008). In the same way, graduates receive updated knowledge on their subjects. After graduation, they become competent scientists and development experts. This model provides a continuous opportunity from basic research to applied action research to outreach, which solves the farmers' problem. Not only does this system extend laboratory-based science to the field, but it also allows framers to bring their problems to the university to be addressed.

Land-Grant University mostly has its command area. Command area of the newly established colleges' in Nepal could be one or more districts. Creating a strong linkage between

education, research, and extension services through different stakeholders and universities can bring positive changes in the quality of agriculture education in Nepal. With the promulgation of federalism in Nepal, new approaches of extension that are required for development of nation seem to be revised in the existing curriculum of universities and other agriculture institutions of Nepal as done in India (ICAR, 2017).

As is the case with other universities in Nepal, the Ministry of Education (MoE) is the liaison ministry for the AFU, IAAS/TU, FWU, PU, Kathmandu University, Mid-Western University, and other agricultural colleges. Graduates produced by education institutions invariably work for agriculture sectors, whether it is for teaching, research, and development. University Grants Commission (UGC) of Nepal provides the fund to universities to promote its teaching and research activities. In India, all agricultural universities are supported by the Indian Council of Agriculture Research (ICAR), the Indian Agricultural Research Institute (IARI) is a government body and the Secretary of Agriculture Ministry is one of the ex-officio Director Generals of IARI. In the case of Nepal, the MoE is ill-equipped, and the dearth of the required knowledge dealing in university education. This ministry neither has an adequate number of experts to cope with the problems of the university system nor skilled persons in technical subjects. So they provide a lump-sum budget to the UGC, which then allots the budget based on the existing number of human resources and the academic programs.

Human Resource Need Assessment is Important

Assessing of human resource need in a country is vital to design academic programs in Nepali universities. A usual trend is that the government mandates universities to produce the required number of experts in specific disciplines. Similarly, periodic need assessment research should be conducted among stakeholders. Major stakeholders could be all three tiers governments, NARC, private sectors, development agencies,

universities, and colleges.

After the promulgation of the new Constitution of Nepal (2015), Nepal is considered a federal democratic republic state. It consists of seven provinces with 77 districts, including 753 local level authorities. The whole country has six metropolitans and 11 sub-metropolitan cities. The new Constitutions of Nepal (2015) have included rights related to food and agricultural resources in article 40 and 51. Likewise, articles 25 and 36 includes right related to land and natural resources. Agriculture Knowledge Centers (AKCs), Veterinary Hospitals and Livestock Expert Centres have been reformed by eliminating previous district level offices like District Agriculture Development Office (DADO). The whole organized structures are transformed into three tiers i.e. federal, state, and local level of government. Despite the new improved federal concept, people have been experiencing difficulty getting services from new administrative system (MoLJPA, 2015). Acharya (2018) has suggested fulfilling the necessary number of human resources to function the new system properly. Since universities of Nepal are still unable to produce experts adequately, private firms are still deprived of qualified staffs. Lacks of functional efficiency of Nepali universities have poorly affected Nepal's commercial agriculture system (Pun, 2019).

However, agriculture graduates are haphazardly being produced in Nepal and the government still fails to develop a concrete plan for human resource development. People having investment capacity are opening colleges as commercial enterprises. Universities and colleges are established based on the employment situation and cost. Recent days charming in agriculture education are due to opportunity to get admission for higher studies abroad. Students prefer to go USA, Europe and Australia for further study and the ultimate intent to migrate from their home country.

A report states that 13,229 Nepali students traveled to the USA in the 2018/19 academic year, making the Nepali community the 12th largest

international student population (Open Doors, 2019); compare this to 1990, when there were only about 600 students from Nepal. This brings urgent attention to academic institutions and the government to think about how to minimize brain drain from the country and invite those experts in the home country.

In response to the change and demand of society, universities have also added new specialized disciplines, for example AFU started teaching the post-graduate program in Weed Science and Seed Technology, Agribusiness Management Rural Sociology (AFU, 2019; Bista *et al.*, 2019). Likewise, new bachelor program in aquaculture at AFU, bachelor program in Horticulture at TU, are some of the positive indicators for the development of agricultural education. Mid-Western University also has planned to launch the organic agriculture program in recent future.

CONCLUSION

To achieve quality education, we must consider reorienting agricultural education with

some policy shifts in the agriculture sector. Nepalese Universities Act should be revised to meet the research and extension demand of the country. All major organizations like provincial governments, NARC, DOA, DLS, AKCs, Veterinary Hospitals and Livestock Expert Centers, and other stakeholders are also brought in same stage to co-ordinate and collaborate with each other. All three levels of federal governments are also bound together with functional linkages with Universities and agricultural colleges system that helps both in funding and administrative function. The Ministry of Agriculture should be the line ministry for the AFU, IAAS/TU and other agriculture colleges. Since many universities are offering agricultural education, the graduates may have different qualities and they can provide service in many sectors of agriculture. To monitor and for quality control of agriculture graduates, Nepal need an Agricultural Council. It is high time to create synergy and one would better understand the other when like-minded organizations work together. This will help to produce competent agriculturist in Nepal.

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