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MISSING THE LINK: STAKEHOLDERS' PERCEPTION TOWARDS AGRICULTURE ACADEMIC INSTITUTIONS' CONTRIBUTION TO INTEGRATE RESEARCH EXTENSION AND EDUCATION INSTITUTIONS IN NEPAL

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ABSTRACT

Currently, thirty Agriculture Academic Institutions (AAI) in two broad categories: constituent campuses and affiliated colleges under six universities are executing agriculture and veterinary science programs nationwide. All these universities have different course curricula, faculties, academic resources, and research & outreach capacities. Literature show that Nepalese AAIs have minimal activities to engage their graduates in communities and service learning. In this sense, AAIs are missing the opportunities to connect farming communities, enterprises and industries. Similarly, faculties of AAIs are mostly confined to classroom teaching and their competencies of engagement in the policy arena are under-utilized. Further, faculties and researchers because of their limited participation in policy engagement are missing the opportunities to share their evidence, expertise and experiences in the (Agriculture Research, Extension, and Education) AREE network. On this ground, a study was designed to capture the AREE stakeholders' opinion that 'Should academic institutions be a part of agriculture research, dissemination of technologies and policy engagement along with the teaching-learning activities?' A cross-sectional perceptual survey was conducted (n=250) using a five-point Likert scale. Cross-tab analysis and one-way ANOVA were conducted to assess the difference in the stakeholders' opinions. The reliability coefficient (0.633) was calculated using Cronbach alpha reliability methods. The findings showed that stakeholders perceived AAI should not be confined merely to teaching-learning activities. It means the stakeholders desire to review the existing mandates of education institutions and expand their roles in the tripartite functions of research extension and education. The stakeholders are not in favor of establishing an arrangement for the apex agency to integrate all of these institutions. To connect and strengthen linkage and integration between AREE institutions, classroom components should be connected with farming & business communities, and industries through service learning in community multi-stakeholder platforms.

Keywords: Agriculture academic institutions, Community engagement, Integration, Service learning

1. INTRODUCTION

Agriculture Academic Institutions (AAI) across the globe educate researchers and extension experts to fulfill the demands of human resources in the agriculture sector (Philips, 1999; Bhattarai et al., 2019). This is reinforced to differing extents through the instruction of hands-on agriculture expertise at higher education levels, in addition, to research conducted

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at specialized AAI. Inadequate connections among research, extension, and education leads to systematic 'bottleneck' within the national agriculture innovation system (Van Crowder & Anderson, 1990). These bottlenecks hinder their capacity to effectively contribute to development (Bourgeois, 1990; Rolling, 1990; Kaimowitz, 1990). The benefits of the robust connections are widely recognized. Even when there is no missing task and responsibilities for each task are assigned, integration cannot be completed without coordination among interrelated tasks, the greater the specialization of the task, the greater the need for integration (Bourgeois, 1990; Gauchan & Timsina, 2022). This is the principle often emphasized in the organizational literature.

Integration is essential for completing tasks even when they are well-defined and responsibilities are assigned. Coordination among interconnected tasks becomes crucial, especially when tasks are highly specialized. This principle is frequently highlighted in organizational literature (Bourgeois, 1990; Robbins et al., 2019).

Proof demonstrates that the integration of research, extension, and education has the potential to enhance the overall performance of the agriculture innovation system. Bourgeois (1990) highlighted the immense tactical significance of establishing seamless inter-organizational linkages to achieve continuous agriculture development cannot be overstated. In the words of Crowder and Anderson (1990) -Why then, the issues of linkage raises the question of why it is pervasive and persistent?

In underdeveloped nations, agricultural research, extension, and education often exist as separate entities. Even in developed countries, these systems can be institutionally distinct, but effective methods of coordination have been established to manage their interconnected natures (Falvey & Bardsley, 1995). Development initiatives in less developed countries have sometimes assumed that adopting a model of institutional integration, like the Land Grant Commission (LGC) system that combines teaching research and extension, is feasible. However political experiences suggest that this approach is expensive and unlikely to yield long-term success. Each country possesses its unique organizational requirements that must be taken into account when designing programs aimed at enhancing the agricultural knowledge system.

Association with higher agriculture education institutions (AAI) with agriculture education has followed a complex trajectory, addressing regional, national, and global food and environmental education and research in the political-economic sector (Falvey & Bardsley, 1995). This historical journey spans over 150 years, the faculties, across its diverse stages of development, is positioned within the broader context of the university and other entities involved in agricultural education. In the days to come the AAIs have to have a crucial role in promoting the advancement of agriculture (Philips, 1999). They must progressively operate on a global scale, collaborating to establish the most effective platform for education and research in agriculture domains (Atchoarena & Holmes, 2004). These collaborations must have prioritized concerns about the environment and enhancing production capacities in less developed nations. These joint efforts will enable specialized focus within each institution, allowing experts to push the boundaries of knowledge in their respective fields.

1.1 RESEARCH QUESTION

This paper is pursued to answer the following two-fold research questions. The first research question is factual type and the second one is more developmental and theoretical than the first one.

1. What is the perception of stakeholders about AAIs role in AREE institution linkage and integration?
2. What possible roles of AAIs could contribute to the linkage and integration with AREE institutions in Nepal?

1.2 OBJECTIVES OF THE RESEARCH

The study specifically seeks to determine AREE stakeholders' opinions toward the role of education institutions. The specific objectives of the study are:

1. To ascertain the views of agriculture research, extension, and education personnel regarding the possible role of AAI in integrating and linking AREE institutions.
2. To develop and suggest a framework for integrating research, extension, and teaching activities led by education institutions in Nepal to promote community engagement and service learning.

2. REVIEW OF LITERATURES

2.1 AGRICULTURE EDUCATION IN NEPAL

Agricultural education in Nepal has experienced blinking prosperities and compromised mergers, usually failing to attempt to catch up to past and current needs and rationalize institutional expenditures and contributions in the development sector (Bhattrai et al., 2019). The vision and vigor of the 1960s were sometimes less evident in public service approaches to the management of agricultural and related education over the century-long history. The then His Majesty's Goverment of Nepal opened School of Agriculture in 1957, under the agriculture section could not have got the academic spirit until 1968. Development of agricultural education infrastructure were followed by the vision of agriculture development but not by the agriculture academicians in the country so the pattern of agriculture education was not so much aligned with the land grant model but did follow the trickle-down approach same as the development pattern of the country (Maharjan & Dhakal, 2023). Agricultural education in Nepal has changed rapidly by number and intake without scoping study the need assessment (Bhattarai et al., 2019; Timsina, 2021; Jaishi et al., 2022). Agricultural education industries and universities have passed through different names to meet the changing needs of the world.

Agricultural programs currently underway in Nepal can be classified in three different ways (Bhattarai et al., 2019; Timsina, 2021; Jaishi et al., 2022).

1. Agriculture universities and institutions that offer agricultural study programs for Bachelor, Masters, and PhD program
2. Technical schools and colleges, which are a combination of related agricultural and pre-diploma and diploma education in the short and long term under CTEVT programs.

3. Technical and vocational school education (TVE) agriculture program for grades 9-12 run by public high school.

Agriculture education and allied sector development are broadly divided into three categories by their phase of development: Foundation phase, technical-vocational education development phase and university expansion phase. The first education institution was established under the Ministry of Agriculture Development in 1957 in the name of the 'School of Agriculture' to produce a labor force for farmers defined as junior technical assistants (Bhattarai et al., 2019). Later in 1996, the school was converted to the faculty of agriculture and began a two-year program intermediate of agricultural science (IAAS, 2020). The agricultural education system in Nepal offers pre-diploma, diploma, bachelor, master, and doctoral degree programs. In master's degree, program offers fifteen specific disciplines in agriculture and allied areas of extension, the development sector, industry, banking, and cooperation. About thirty agriculture academic institutions (AAI) of private and constituent agricultural colleges and institutions implement their academic program with about 2500 graduate intake capacity annually (Shrestha & Timilsina, 2022; Jaishi et al., 2020). However, many agricultural graduates are unemployed and under-utilized, and many of them change their disciplines to other sectors. At the same time public research, extension, and education systems facing a serious human resource crisis. The quality of teaching-learning has declined over time, specifically in private affiliated colleges in remote satellite colleges. While many agricultural universities do not rise to the set standards in education. To meet the demand for low-level educational needs many public institutions CTEVT are offering pre-diploma, diploma, and certificate courses. Since 2014 higher education under the Ministry of Education also implemented agriculture courses in grades 8, 9, 10, 11, and 12.

School education in the agriculture stream is also been prioritized in recent decades. Recently, the government has changed the school's curriculum, which requires compulsory education for the ninth, tenth, eleventh, and twelfth grades (Bhattarai et al., 2019). To increase the number of agricultural technical workers in the country, the latest amendments have prepared a ninth and tenth-grade curriculum for those students who are motivated to obtain a higher education. Under this stream currently in 48 of 77 districts, operated by local government schools run JTA programs in which students in each class (ninth, tenth, eleventh and twelfth grade) teach five different agricultural subjects in combination with other subjects. The focus has been given to more on the practical application (60:40 theories and practical) basis.

Table 1. Policy constraint and policy gaps in AAI-community engagement in Nepal

Policy constraints	**Policy gaps**	**Evidence gaps**	**Research priorities**
Functional and operational mechanisms for service learning and community engagement are required	Holistic teaching research and extension policies in the changed higher education context are yet to be developed	Empirical information and database, inventory on the extent of vertical and horizontal coordination among AAIs and community	Identify the factors for appropriate institutional mechanisms and policy framework for the development of service learning and AAI community engagement

Source: Authors compilation

Regarding the infusion of higher education into extension and advisory services at the national level, the AAI has now been included in the REE committee recently which is the national apex and coordinating entity of AREE mechanism. The REE coordination committee has been formed to advise AREE institutions on setting their AREE priorities at the national provincial and field levels. Currently, this boarding mechanism is secretariat by the Department of Agriculture. This committee mechanism is envisioned to be established on four levels: National, provincial, cluster, and municipal. Thus, the AAIs can play technical backstopping and other potential roles through this mechanism.

Ramasamy and Selvaraju (2007) mentioned that AAI should emphasize producing graduates by revisiting the curriculum as job providers, not job seekers. This is possible only through the engagement of graduates in rural agricultural work experience, industrial tie-up programs, community service learning and community-AAI engagement programs (Mitchel, 2008). Vocational schemes are another scheme for students who are unable to pursue higher education (Jaishi et al., 2022). At present agriculture extension, research, and education are conducted by three different institutions under two different ministries.

Weak horizontal and vertical linkage and integration mechanisms among the services of these institutions (Das et al., 2019). Currently, neither of the AAI of six universities can meet its preeminent standard of Land Grant Universities in its teaching, research, and extension mandates. The current funding structures, mechanisms, human resources, capacities of the faculties and the associates, policies, and mandates are in conflicting situations to provide its goal and objectives because of external, internal and personnel factors (Table 2).

Table 2. Factors affecting achievement of the objectives of Agriculture Academic Institutions of Nepal

External factors	**Internal factors**	**Personnel factors**
Weak national, provincial, and local support	Failure to achieve the multidisciplinary goal of AAI	Weak participation in the policy process
Decrease in financial investment	Absence of research and outreach projects and program	Improper and inadequate lobbying by AAI leaders
Vested interest in a graduate circle and political influence	Inbreeding in staff capacity	Lack of creativity and expectation in both faculties and graduates
Isolation of AAI from national higher education system	Declining the teaching and research facilities	Absence of skills to link & integrate with business, industry, market & community

Source: Bajracharya (2020), QAAC (2021), UGC (2021)

2.2 THEORETICAL FRAMEWORK OF THE STUDY

The study applied the description of system theory and inter-organizational theory of integration. System theory provides the analytical framework to facilitate the understanding of the undercurrents of inter-group association (Alawa et al., 2020). According to Hooyman (1976), inter-organizational theories describe how two or more formal organizations or

institutions relate to each other functionally. This functional relationship can be useful in assessing the structural variables that affect the problems and the potential of cooperation between and among the agencies. System theory stresses the casual boundaries influenced by context and defined by structure, functions and roles. So both classroom components and community components must be viewed as a holistic education system (UGC, 2022, UGC, 2023). Every system is more than the sum of its parts. Regarding the AIS model, education should be an integral part of technology generation and extension and outreach of technology to enhance the production system toward achieving sustainable agriculture and rural development (Sulaiman, 2015; Hellin & Camacho, 2017).

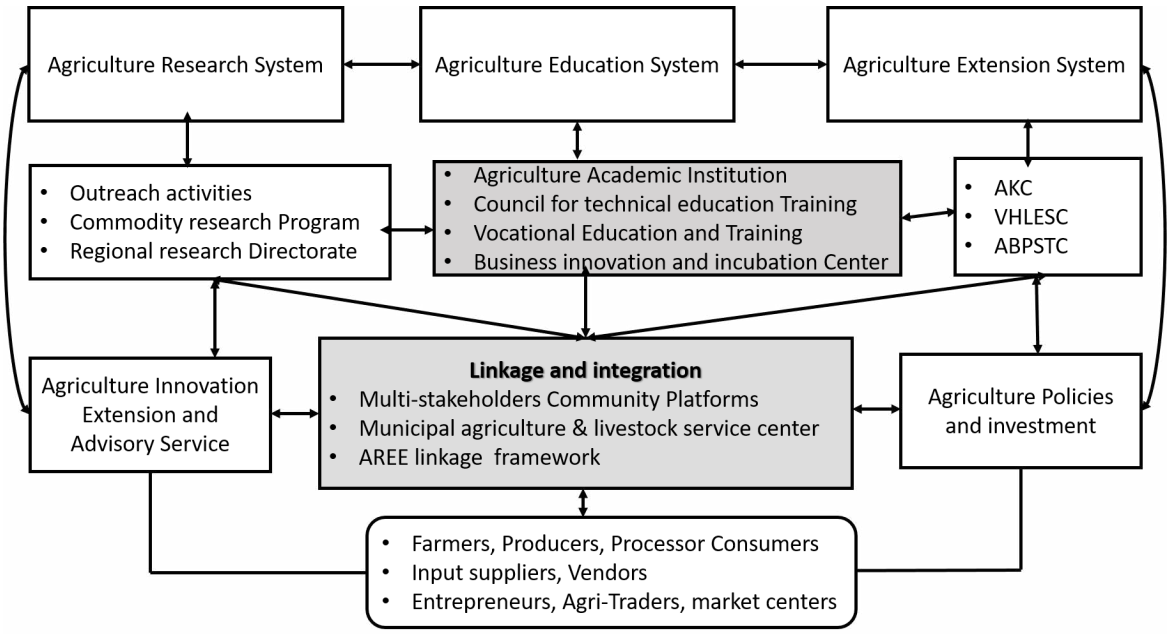

Figure 1. Three subsystem of AREE of Nepal and its integration with AREE framework

Literature shows that educational institutions must be an integral part of agricultural innovation systems along with all sorts of capacity development processes in the field of agriculture and rural development (Chakraborty, 2020; Alawa et al., 2020). In the National Agricultural Research and Extension System (NAERS), AAI is not included yet, but stakeholders are realizing the significance of AAI at different forums and platforms. The major slab, as perceived apparently, is the difference of affiliation of educational, research, and extension institutions in two separate ministries. Agriculture education goes under the Ministry of Education (MoE) whereas agriculture research is operated by NARC Act, 2089 and the extension functionaries are under the Ministry of Agriculture and Livestock Development (MoALD). Thus, they are mutually exclusive in way of integration or to be linked formally together. In this way, as AAIs are not included in MoALD, they cannot get ample opportunities to use research and outreach funds from the ministry.

3. MATERIALS AND METHODS

A cross-sectional deductive approach based on the positivist philosophy was applied. An opinion survey as a research design was conducted to measure the opinions of the personnel

responsible for AREE institutions. A total of 250 respondents from four categories of strata: research, extension, education and private sector were considered (Table 3).

Table 3. Stakeholders and number of respondents taken in the opinion survey

AREE Stakeholders	Respondents by the level of operation			Total
	Executive-level	Mid-level	Field-level	
Research agencies	33	30	13	76
Extension agencies	19	33	18	70
Education agencies	23	20	11	54
Private sector agencies	27	19	4	50
Total	102	102	45	250

A five-point Likert-type scale was developed and a self-administered questionnaire method of data collection technique was used. This technique is more common because all the respondents of this survey have a higher level of education. It is more economical and has a higher level of rate of return. The self-administered survey is a questionnaire that is designed explicitly to be completed by respondents without the assistance of interviewers or bias (Cleo & Dillman, 1995). Perception analysis was conducted to assess the views of AREE stakeholders. Mean, mode, range, and standard deviation were calculated using cross-tab analysis and compared the views of AREE stakeholders. The decision level: agreement and disagreement were analyzed using the sum and the mean of opinions.

4. RESULTS

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENTS

Of the respondents were 58.40 percent were from the public sector 21.60 percent were from the corporation sector and 20 percent from the private sector. As stated in the sampling strategies from the research sector 30.40 percent, extension 28 percent, education sector 21.60 percent, and private sector represented 20 percent respectively (Table 3). The number of projects handled, district exposures, number of training workshops participated number of publications of the respondents from four categories of institutions are displayed in Table 4. The researchers assumed that a higher number of entities positively correlated with a higher number of functional linkage projects and programs. The table shows that the standard deviation of almost all items found higher than the mean value demonstrates the varied capacity of respondents within the organization.

Table 4. Socio-demographic characteristics of respondents by type of organization

	Number of projects handled				No. of training workshops & seminars				Number of publication			
Agency	Re	Ex	Ed	Pr	Re	Ex	Ed	Pr	Re	Ex	Ed	Pr
Mean	9.82	5.20	5.29	6.68	21.39	18.27	20.16	23.42	19.25	3.05	28.01	4.18
SD	15.15	13.53	4.71	8.66	24.83	21.92	20.15	24.05	47.58	4.19	55.10	9.81
Minimum	0	0	0	0	0	0	3	0	0	0	0	0
Maximum	120	100	20	50	150	100	100	100	400	20	280	50

Note: Re=Research agency, Ex=Extension agency, Ed=education agency, Pr=Private agency

4.2 STAKEHOLDERS' PERCEPTION OF AAI ROLE IN AREE LINKAGE AND INTEGRATION

One of the most confounding aspects of the Likert scale used to measure the perception of people many of the variables are psychological in the form of latent constructs difficult to observe directly (Blanchard et al., 2014). The Likert-type scale is constructed by adding up the defining the items of observation. According to John (2010), the Likert-type scale is a composite of the battery of multiple items. Altogether an items scale was prepared and asked about their views regarding the possible roles of education institutions in research-extensioneducation integration. participants agreed that the participating efforts are occurring throughout the many disciplines primarily driven by external agencies but they also agree that the integration is their mandate. Lack of funding and skilled human resources are cited as primary barriers to integration. Although not in the same way respondents agreed that organization structures are inclined to integration however the organization's goals, functions, and annual targets are imposed to compel them to work in isolation. Despite the divergence in perspective among the AREE stakeholders all agreed to have value in integration (Table 5).

Table 5. AREE stakeholder's response towards the AAI role in linkage and integration

Items	Perceptual statement	Mean	Mode	SD	Range	Sum	Decision
1	Agriculture Academic Institutions (AAIs) can bridge the AREE institutions for linkage and integration	1.60	2	.581	2	399	Agreed
2	AAI may engage in technology transfer through a community engagement and service learning program	1.64	2	.600	2	410	Agreed
3	AAI engagement in policy formulation and sharing may strengthen AREE linkage and integration	1.82	2	.552	2	456	Agreed
4	AAI could engage in the capacity building and technical assistance of the personnel of other AREE institutions	1.71	2	.572	2	427	Agreed
5	A separate and apex agency is essential to link and integrate all these AREE institutions for technical assistance	2.77	3	1.24	4	692	Disagreed

The weightage mean score of the observed items was calculated as 9.54/5=1.90. All the individual items of the scale were compared with the weighted mean score and the decision was made. It is estimated that all the items except 5, have a mean value lower than the weighted mean. It indicates that people irrespective of their organization have agreed to foresee the AAIs role in bridging AREE institutions, technology transfer, policy engagement, and capacity building. However, people have slightly different opinions about the need for a separate agency may be one of the options to integrate the AREE institution. Having a higher range value of 4 of the 5th item indicated that stakeholders are very much divided on this particular opinion. Disagreement on the need for a separate apex agency is probably

because of the current nature and characteristics of the job they are doing. Mostly they are unaware of the value of integration through apex agency. The reasons for this perception also can be justified that the internal organizational pressures and culture of traditional AREE institutions are often insufficient to ensure the linkage and integration take place. In a study in India, Soam et al. (2023) mentioned that National Education Policy 2020 demands a separate multi-stakeholder higher education institution. This institution will facilitate the research, and innovation, which requires effective linkage among stakeholders more specifically among academia and industry.

According to Fortner (2022) complementarity of linkage and integration between AREE actors go beyond the respective research scaling-up capabilities. Partnership in the projects and program for baseline assessment, feasibility study, mid-term evaluation, impact evaluation, and technology evaluation AREE actors can contribute commentary functions within each of the of research-extension-education-farmers' continuum (Crowder & Anderson, 1997; Glover, 2019; Fortner, 2022).

The chi-square test of independence was carried out to examine the association between types of organizations (research, extension, education, and private sector) and their perception of AAI roles. Five items to explain the AREE persons' perception were constructed to measure their opinions. The null hypothesis for this test is that there is no relationship between their perception and the stakeholders' type of organization. The result shows that 1st, 2nd ,3rd and 4th statements have a significant relationship between the type of organization and the perception. However, the 5th statement related to the need for separate agencies to bridge the AREE intuitions differ significantly (Table 6). However, the perception of the personnel by level of respondents has no significant association between the perception and the level of respondents (Executive, mid and front line) for all of five perceptual statements (p=.221, p=.181, p=.999, p=.893, p=.631). Partial eta squared (η^2) was calculated by comparing more than two groups of people to estimate how large of an effect of independent variables on dependent variables. the test showed a small effect size of independent to dependent variables for all five perceptual statements ($\eta^{2=}$.055, .055,.053, .020, .007).

Table 6. Respondents' statement to measure the perception towards AAI's role of AREE integration by types of organization and level of respondents

Items	Statement of perception	Level of significance		Eta Squared (η^2)
		Type of organization	Level of respondents	
1	AAI can bridge the AREE institution for integration	p=.003	p=.221	.055
2	AAI may engage in technology transfer through a community engagement program	p=.006	p=.181	.055
3	AAI engagement in policy formulation and sharing may enhance AREE integration	p=.004	p=.999	.053
4	AAI could engage in the capacity building and technical assistance of other AREE institution	p=.008	p=.893	.020
5	A separate agency is essential to integrate AREE institutions for technical assistance	p=.132	p=.631	.007

The test of one-way ANOVA was conducted to test whether the perception of AREE stakeholders by organization and level of respondent differ or not? The hypothesis was, there was no difference in the opinions of the people by the organization and level of the respondents towards the AAI role and contribution. In the case of the type of organization, the alternative hypothesis is accepted and can be said that the respondents of different organizations viewed differently and the association was found significant (p=.046) between the type of respondent by the organization and the perception. Also in the case of the level of respondents, respondents viewed significantly different opinions towards AAI-community engagement. That means all the respondents by type and level of respondents agreed that AAI-community engagement can promote linkage and integration among AREE institutions.

Table 7. Difference of the perception of the stakeholders towards the Community-AAI's engagement

Cases	Sum of Squares	Df.	Mean Square	F	p	η^2	ω^2	η^2_p
Types of organization	53.932	3	17.977	3.834	0.046	0.010	0.045	0.033
Level of respondent	9.090	2	4.545	0.969	0.008	0.381	0.008	0.000
ToO ✻ LoR	19.234	6	3.206	0.684	0.017	0.663	0.016	0.000
Residuals	1115.901	238	4.689					

5. DISCUSSION

Agriculture research, extension and education linkage in general are weak in Nepal (Gauchan et al., 2022). Early in the 90 decades Crowder and Anderson (1997) and Rivera (1995) were in favors of the integrative approach of AREE. The existing linkage mechanisms are more formal rather than effective, and efficient in action and outputs. The tripartite relationship between these research-outreach and teaching functions interface is critical (Gauchan et al., 2022). The results from the above analysis showed that stakeholders perceived that AAI should not be confined only merely teaching learning activities. It means the stakeholders desire to review the existing mandates of education institutions and expand their roles in the tripartite functions of research extension and education. The post-pandemic situation and National Education Policy (2019) demand that community engagement be mainstreamed in all teaching-learning and research service activities.

The study by Alawa et al. (2020) recommended agriculture education and extension through policies for implementation. Findings also agree with the (Philip, 1999; Shrestha &Timsina, 2022; Jaishi et al., 2023) Linking learning with community service, linking research with community knowledge, knowledge sharing and mobilization, devising new curricula and courses, including practitioners as teachers and social innovation by students are the major approaches to community engagement. The AAI can choose any combination of community engagement forms. In light of the global and national approaches currently available, the University Grant Commission has set key five principles of community engagement and service learning (UGC, 2022). HAI is being encouraged to foster social responsibilities and community engagement through the principle of mutual learning and respect, university-

wide in faculty and disciplines, credit-based course for students, credit for teachers for their engagement and the linkage with local institutions.

Several research findings agreed on the positive impact of academic collaboration on research productivity, but the link is not understandable. However, there is little consensus on the benefits of academy-business interactions. The evidences of this scant and contradictory relation are also cited (Rivera-Hurta et al., 2011). Henize et al. (2009) stated that collaboration among different types of stakeholders is often viewed as a positive factor between knowledge creators and problem-solving communities. Rijnsoever et al. (2008) stated that the collaboration among researchers to develop academic careers and science-industry collaboration are not clear. All levels of network activity within the scientific community is positively related, academic rank and networking activity is strongly correlated but authors showed the non-academic interactions show no correlation between academic rank.

The high value of collaboration among scientists and university researchers' interaction with the business community is generally acknowledged. According to Rijnsoever and Hessels (2021) the drivers and barriers of university-community-industry collaboration are oriented towards heterogeneous factors: the intellectual goal, recognition, and monetary incentives. This heterogeneity shows that a combination of interventions will required for the government to promote university-industry-community linkage (Rijnsoever et al., 2008).

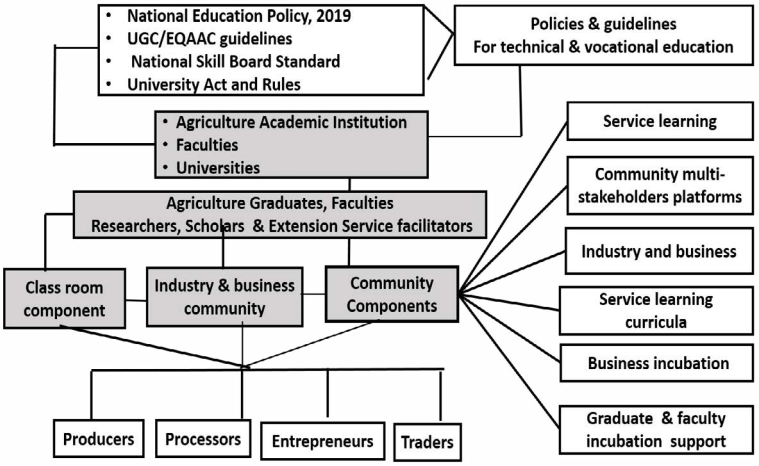

Figure 2. Three components of agriculture education and community engagement framework for Nepalese AAI

Rivera-Huerta et al. (2011) found positive relation between university researcher and farmers' interaction. So the new ideas for putting learning theories into practice educators should be aware. According to constructionism philosophy of learning, learning theory is about people's learning behavior. According to this theory, learners have to be exposed to more exposure and observation to make teaching happen (Nichols, 2000). Constructionism roots into the social, and psychological philosophy of education and learnings (Oliver, 2000). According to experiential learning theory, learning depends on how much of experiences is transformed to knowledge (Alkan, 2016). It is an engaged learning process whereby learners learn by doing in the guidance of researchers and educators. In this sense community engagement is key not only for maximization of learning but also for linking and integrating

in common platforms. In 1964 Kolbs summarized four stages of the cycle: Concrete experiences, reflective observation, abstract conceptualization and active experimentation. These four stages of learning emphasize that learning is a process. Activity theory of learning is a psychological meta-theory is a paradigm or framework about studying thought and consciousness. According to the activity theory of learning, practical action in a sociocultural world through six related elements: object orientation, community externalization, tool mediation, social hierarchical structure and rules (Hung & Wong, 2000). The productivity of new recommendations is positively influenced by both of breadth of linkage and their duration for university research and development (Rivera-Huerta, 2011). So maximum number and duration of community exposures must be highlighted and emphasized in both classroom components and community components. through revitalizing AAI curricula.

6. CONCLUSION

Theoretical and dysfunctional linkage and integration of AREE exist. So the variety of reasons for reform in linkage and integration had become necessary in the national agricultural extension system of Nepal. The perceptions of the researcher, extension experts, educators, development experts, and private entrepreneurs were crafted. The design and implementation of an integrated AREE system will require a realistic assessment of the opportunities and constraints within the institutional context of a specific nation with particular attention to internal, external, human, structural, and psychological factors to improve the linkage and integration system.

Agriculture research, extension and education will be the instruments of growth that must be integrated. AAI has great potential to improve the integration. The question of how AAI contributes for systematic integration is the focus of this paper. How do these mechanisms operate in practice? The answer depends on how far the AREE stakeholders are willing and able to make them work. Several structural mechanisms are to be found to utilize the opportunities of integrations. With the structural and functional linkage and integration of educational institutions into the AREE institutions network, education actors could also actively participate and minimize the linkage gaps.

Inputs from AREE stakeholders overwhelm the perception that the academic institution should be a part of the mainstream of designing agriculture research, agriculture policy formulation, and dissemination of technologies. The study provides insight into integrating classroom and community components: Linking community knowledge, knowledge mobilization, designing new curricula, linking service learning with industries & incubation centers, and graduate innovation. It is, therefore, the opportunities in this sector must be scaled up so which can attract and mentor high-quality graduates by improving the standard of research and teaching learning relevance by blending AAI-community engagement and service learning approaches. Linkage and integration in this sense improve the quality of AAI and promote sustainable innovation and growth. The results of this research are explorative in nature. Future research have to design to explore the details of strength of relationship and associated factors. Also the details of research on the necessity of apex agency to connect and integrate all these AREE intuitions in national level is further research.

SUGGESTION FOR IMPLICATIONS

1. To accomplish the commitments of AAI, there is a need for adequate blending of classroom components with community components. AAI–community engagement and service learning system to be set up in AAI. It helps to solve the dual problem of human resource shortage and promotes real-time solutions for farming communities.
2. The establishment of the innovation-incubation hub in AAI may support the integration of research, extension and community outreach activities to blend teaching-learning and experience learning is strongly suggested. The higher Agriculture Academic Institution must focus a research and innovation by setting up incubation centers, and technology development process centers in frontier research areas.
3. It is recommended that the existing structure of the apex agency like a center or central directorate of agriculture research extension and education be strengthened to identify, develop, implement, and monitor the AREE integration efforts. In addition, the agency also provides a springboard for securing resources for faculty and extension educators to carry out capacity enhancement efforts. The curriculum of any capacity development should be approved and assessed by this agency.

Relevancy of curriculum is a big question is to assess what a student, industry, community, producers, and entrepreneurs need and what kinds of curriculum they are interested. So continuous curriculum feedback system should be maintained through workshops. The instructors and educational designers in the academic institution have to be aware of what is going on in the workforce, and service and industry sectors.

DECLARATION

The authors declare no conflict of interest.

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