

Research and Extension Roles and Standpoints on Collaboration in technology Promotion and Transfer at a Higher Education Institution in the Philippines

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Abstract— *Research and extension collaboration has been considered by policymakers as a critical factor in the success of efforts at lifting the agricultural sector especially in developing countries. Generation of technologies aimed at improving crop yields and farmers' incomes are mainly the researchers' role, while dissemination, promotion and transfer of these technologies for adoption especially by small-scale farmers is traditionally regarded as the extensionists' main tasks. The research-extension linkage has been studied in terms of extent of collaboration and communication and causes of weak linkage, but not a single study explored how collaboration is viewed and what roles the researchers and extensionists assume in technology transfer. This study aimed to find out the roles and standpoints of researchers and extensionists in the promotion of technologies generated in an agricultural higher education institution (HEI) in the northern Philippines. Qualitative methodology was utilized to gather data from nine researchers and five extensionists who were all chosen through purposive sampling and who were all from the HEI. Thematic analysis was used to analyze the transcribed interviews. Findings show that researchers performed the role of technology transfer agents while extensionists served merely as reinforcement to the promotion activities of the researchers. There were differing standpoints about technology promotion and transfer, with the researchers' viewpoint of extensionists' lack of competence as a critical reason for not relegating this role to them, due to the extensionists' non-involvement in the generation of the technologies. Lack of linkage between the two prevented the extensionists from assuming their prescribed role as technology transfer agent, doing instead the role of facilitator and organizer of farmers' trainings. The study results call for a re-articulation of extensionists' function and for their involvement in research centers' implementation plan for technology promotion and transfer.*

Keywords— *researcher, extension, collaboration, roles, standpoints, technology promotion*

I. INTRODUCTION

The importance of agricultural sustainable development is particularly high in Southeast Asia, with agriculture occupying a particularly important position in the economic and social development of Southeast Asian countries (Liu et al, 2020). This entails hastening the pace of agricultural development and finding solutions to problems of agricultural productivity. One of the primary means for accelerating the rate of agricultural development is to put more emphasis on the efficient application of the results of agricultural research.

Research and extension assume significant roles in enhancing agricultural productivity. Research for development in agriculture and extension services have been a strong driving force for meeting food supply around the world (Wesley & Faminow, 2014). Generation of technologies and practices whose aim is to improve the farm productivity and farmers' incomes are the main task of researchers. The Extension, on the other hand, provides the mechanism for these technologies to be disseminated for adoption especially by small-scale farmers. In order for a successful technology transfer, therefore, these two

essential support services need to be effectively linked (APO, 2003).

Technologies that are products of research may not be utilized efficiently by the farmers without the extensionists who are tasked to disseminate them to farmers for adoption. Extension services act as a bridge between technology generators and scientists, who try to provide solutions to through research, and the farmers who need them. Only when these technologies are shared to farmers that these technologies would result in increase in farm yields and assurance of food security. (Wesley & Faminow, 2014). This calls for effective collaboration between researchers and extensionists so they indeed could contribute significantly to agricultural development programs. Hence, a strong linkage has to be fostered between them (Sewnet, et al, 2015). Linkage between research and extension is particularly important for efficiency and effectiveness of delivery of agricultural technology, among other reasons (Deneke & Gulti, 2016).

Indeed, the collaboration between research and extension have been recognized as one of the most critical factors in the success of efforts at lifting the agricultural sector all over the world. Good communication, strong interaction and effective collaboration must mark research and extension in order for them to fulfill their responsibilities.

The Asian Productivity Organization acknowledged that one of the problems and issues confronting the Philippines' agricultural system is the weak research extension linkages especially between the research institutions and the extension system which have affected the transfer of knowledge to the farming/fishing community and the latter's feedback to research (APO,2003).

Universities have been considered as the traditional research sites and the leader in the generation of agricultural technologies. In Southeast Asia, there are over 6000 higher education institutions (HEIs) (ASEAN Secretariat, 2014 as cited in Nelles & Ferrand, 2021). In the Philippines, not only are agricultural agencies tasked to engage in research and extension, but the HEIs as well. In fact, these HEIs are mandated by the Commission on Higher Education to engage in research to generate new knowledge, seek new technologies and promote sustainable development through research and extension. This is in recognition of the vital role these HEIs play in the development of the rural poor, including the small farmers who comprise the majority of farmers in South East Asia (Millar, n.d) so that they can become self-reliant and active partners in regional and national development.

The HEI in northern Philippines is one of the state universities that engages in a tri-fold function of instruction, research and extension as mandated by the CHED. Generation of researches that lead to development of innovations and technologies at this northern Philippines HEI is carried out at the research centers, tasked to pursue research and development focused on specific commodities and researchers' fields of specialization. Most of the projects undertaken in these centers are funded by donor agencies. Meanwhile, the Extension Department of this HEI implements program and projects towards "the improvement of the quality of life of their clientele" through dissemination and transfer of mature technologies developed by research. Strategies to accomplish such agenda include adopt-a-barangay, information, education and communication materials production. Technology promotion and commercialization activities promote the application and commercialization of appropriate package of matured technologies for the eventual adoption of specific clientele. Strategies adopted by the Extension Department include the establishment of demonstration farms, dissemination of information through conduct of trainings, techno fora, exhibits, radio and television broadcasts and, distribution of techno-guides, primers, pamphlets and newsletters. Looking at these mandated functions and roles of extension, it gives the impression that the two groups—the researchers and the extensionists would communicate and collaborate towards a successful promotion of technologies generated at this northern Philippines HEI. It would thus be laudable to look into the actual practice of technology promotion in this HEI. It has been observed that although the linkage between researchers and extensionists has been recognized as crucial to the success of technology transfer, its implementation has been lacking.

Challenging HEIS in Southeast Asia to contribute to sustainable agriculture and food systems to meet the Sustainable Development Goals in the region, Nelles & Ferrand (2021) contend that these HEIs must do more to assist society and governments through among other things, better research and extension services. They also advocated for systematically collecting and analyzing data on agricultural development and food sustainability, which calls for effective research and extension. This study looked into the collaboration between research and extension in technology promotion which is recognized as critical in improving the agricultural sector.

1.1 Objectives of the study

This study sought to find out the roles and standpoints of researchers and extensionists on the promotion and transfer of technologies generated in an

agricultural higher education institution in northern Philippines. Specifically, it aimed to

1. To find out the roles and involvement of researchers and extensionists in the promotion and transfer of generated technologies in this HEI;
2. To determine their standpoints pertaining to research-extension collaboration in the promotion and transfer of the technologies.

II. METHODOLOGY

Research Design

Qualitative research design guided the conduct of this study. In-depth interviewing making use of open-ended questions was used to generate data for this study. The questions delved on the roles of researchers and extensionists and on the existence of collaboration in the promotion of technologies generated by the researchers in an agricultural higher education institution in northern Philippines. Patterns were then noted in the narratives of the participants.

Locale and Participants for this Study

This study was conducted from January, 2019 to June 2019 in an agricultural higher education institution in Northern Philippines. There were ten participants in this study who were all permanent employees of this HEI; seven were researchers and three were extensionists. Five of the researchers were directors of research centers while the other two occupied top management positions in the said HEI. Two of the three extensionists were also heads at the Extension department. They were chosen through purposive sampling, the method of choice for qualitative researchers to ensure that recruitment efforts are directed towards finding those who have experienced the phenomenon of interest and who would be most beneficial to the study (Polit & Beck, 2008). Also, some participants were asked to refer others who they believed might contribute to the study.

Research Instrument

A list of five open-ended questions was prepared to serve as guide during the actual interview. The questions dealt on the participants' role and involvement in the promotion and transfer of technologies generated at the research centers of the HEI, as well as on their standpoints regarding collaboration for the promotion and transfer of the technologies.

Data Gathering Method

All the participants were informed about the purpose of the study prior to the interview. As part of ethical considerations, each was handed out an Informed Consent Form which laid out their option to withdraw anytime during the interview proper and their agreement for their statements to be quoted in the publication of the

study. Interviews were conducted in the offices of the participants. With the participants' consent, all interviews were captured using a digital voice recorder, then transcribed word for word immediately after the interview was completed. The transcription was recorded in Word document.

Analysis of Data

Thematic analysis was utilized to aid the analysis for the data generated from the interview with the participants. Fereday and Cochrane (2006) describes thematic analysis as a "form of pattern recognition within the data, where emerging themes become the categories for analysis". This was carried out by coding each statement of a participant. Similarly-coded statements were then grouped under a subtheme. Themes were later generated through a careful reading and re-reading of the data.

III. RESULTS AND DISCUSSION

Profile of the participants

All the participants were permanent employees of the HEI. The researchers were doctorate degree holders occupying top level faculty positions. Two of the extensionists were also doctorate degree holders. Most of the participants were male. All the researchers who were interviewed for this study served as directors of research centers where they conduct researches aimed at technology generation. They had been in the HEI for an average of 15 years.

Roles of researchers and extensionists in the promotion of generated technologies

Researcher as technology transfer agent

All the researchers revealed that they interacted directly with farmers and demonstrated to them the rudiments of their generated technologies. The farmers communicated with them directly by going to the research centers inside the HEI campus and requested the researchers to demonstrate the rudiments of the generated technologies to them in their barangays. The following were excerpts of the interview with the researchers:

When you trace the product development, I as the researcher developed the technology, then I extended it to the farmers.

What I did before was we went to the barangays, especially in the adopted barangays of Extension. I gave the farmers a lecture on how to put up a vermicomposting facility, what to feed the vermi worms. I also gave each farmer 1/2 kg of vermin worms so they could start building their own very vermicompost structure.

According to the researchers, transfer of technologies that were generated by the researchers at the

research centers was part of the research-extension continuum.

Technology promotion is part of our tasks because our research project has a research-extension continuum. In this project, conducting the research on product development has an Extension part. We extend information about our technologies to the farmers. So, we conduct trainings for those who are interested to apply our technologies. It's part of our Extension-related activity. Hence, technology promotion is done by the research team at the center.

Inquiring into the role of extensionists and whether the researchers had opportunities of collaboration with them during the technology dissemination and promotion, a role that is commonly identified with the extensionists, all the researchers were in unison in stating that technology promotion was part of the project implementation framework.

Extension is already part of our framework, because the processes involved in the application of our technology can only be explained by us. The Extension personnel do not possess basic knowledge in crop science. This is the reason why technology transfer must not be passed on to them.

Lack of technical competence of extension workers in transferring the researcher-generated technologies was an important reason that the researchers revealed as a factor in deciding to assume the role of technology transfer agent. It must be noted that the extension workers' lack of competence was identified as constraint in addressing farmers' specific problems in a study by Baloch & Thapa (2018) in Pakistan.

There are many questions raised during technology transfer, such as how the farmers could make use of the technology which the extensionists could not answer because they lack the knowledge on the rudiments of the technologies. That is why it is the researchers who generated the technologies who must transfer them to the farmers.

The contribution of Extension to information dissemination is huge. However, we have more chances of technology promotion because we're more knowledgeable on the technology compared to the Extension. The role of Extension people is more on creating awareness, but basically, the details of the technology come from us.

The researchers also revealed that extension as a function was part of the researcher's mandate as faculty of this academic institution. One researcher who was developing technologies for goat production and goat meat products acknowledged that the contribution of extensionists from this state university in disseminating

information about goat production was considerable. This role, he said, directed at awareness creation about the existence of the project.

We're also part of Extension, because we're part of RDET. We're still part of Extension because we are faculty of this university and thus, part of our responsibility role is Extension. We conduct trainings as part of our Extension function. It is why we submit our accomplishment report to Extension Office.

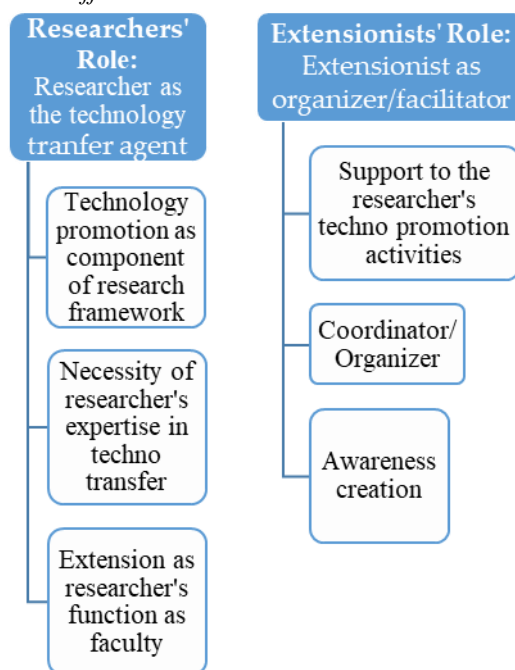


Fig. 1. Roles of researchers and extensionists in technology promotion

3.2.2 Extensionists as organizer and facilitator

All the researchers pointed out that the extensionists served as reinforcement to their technology promotion efforts. The following were excerpts during the interview with one of the researchers:

The role of Extension is—we submit reports to them. They serve as back up. When they conduct trainings in the barangays, they inform the participants that we have generated a technology to improve their animal production.

During farmers' trainings organized by extension personnel, the researchers were invited as resource persons. The researcher who developed technologies for canning goat meat stated:

There are goat raisers who attended the trainings conducted by the Extension Department in its adopted barangays. I was invited many times to talk about goats. Then there were farmers who started raising goats because of these Extension-organized trainings.

The researchers also noted that the Extension Department informed the farmers and the general public about the existence of the technologies and directed interested individuals to the research centers. The goat researcher revealed that there were farmers who visited the goat center through the Extension. According to one researcher,

The role of Extension is more on creating awareness, but basically, the details of the technology come from us. That's why, what we do is when they invite us, we join them. But sometimes, they do it on their own, because they have the flyers. If the farmers need detailed information, they advised them to visit the centers. This is indicated in the flyers, "For more information, visit the center".

Production of flyers and other information, education and communication materials on the generated technologies was also not relegated to the Extension department. A head extensionist revealed that this task had been assumed also by the researchers because production of these materials was part of the funding that the latter received from the donor agency. This extensionist revealed further that the Extension Department only request for copies from the research centers for distribution during trade fairs that the Extension office either had organized or attended.

Explaining the role of Extension Office in his research project, one of the researchers who generated an organic fertilizer said:

The extensionists ask us for our products to display in trade fairs and exhibits in malls. They also invite us to conduct trainings for farmers in the adopted barangays. I serve as the resource person and my staff conduct the demonstration. We also produce the IEC materials which they distribute to the farmers.

Because technology transfer had been assumed mostly by the researchers, the Extension's role has been reduced to being a reinforcement, a minimal contribution that is a far cry to their mandated function. A senior extensionist said,

Ideally, the role of Extension is to conduct trainings. Basically, we first determine what the barangay needs, what technology we can give to them. But the researcher is the one who transfers the technology. We just assist, we organize the farmers. It's the researcher who puts up the demonstration farms assisted by the research assistants. We don't have the right as extensionists to transfer the technologies. Thus, the role of extensionists is as organizer and facilitator.

Highlighting the extensionists' role as organizer/facilitator, a senior researcher stressed this

The Extension department is just a coordinating unit. It just monitors, coordinates and evaluates the R and E activities of the faculty members. The functions of R & E are in one person, the faculty.

Being organizers and facilitators imply a supplemental or reinforcement role which another extensionist also observed as an indication of their insignificant involvement in the technology promotion conducted by the researchers. These were excerpts from his statements:

We don't even serve as a data bank, but we just request documents from the researchers from the research centers. They have their own extension in their respective centers. The research centers have their separate structure, management staff, and operation. They are sustainable, viable, with project staff, having equipment and manpower.

These observations corroborate the position of the researchers interviewed for this study with regard to the minimal role of the extensionists in the promotion of technologies generated at the research centers in this HEI. It must be noted that this arrangement runs contrary to Saikia et al's (2013) claim that extension's mandate revolves around the transfer of technology from research centers to farmers. Anderson & Feder (2003) likewise noted that it is the role of extension staff to deliver research information effectively, ensure their proper utilization by the farm clients, and serve as a feedback mechanism to researchers on problems faced by farmers. Similar views are also shared by Budak and Yurdakul (2004) who contended that effective technology transfer requires firm linkages between research and extension. In the case of this HEI, this advocated linkage seems to be obscure and indeterminate, an important realization which calls for reflection.

These roles are explained further in the following statements of a senior researcher:

Since these are special projects, we cannot blame the researchers for assuming at the same time the function of technology transfer because they know very well the targets so that you cannot rely on other people to do them for you. You cannot also blame the Extension people for their minimal participation because they're not part of the project. But they can do something with the information that you give them-they can produce flyers. They can always go to our office.

From the narratives of the researchers, it was clearly surfaced that promotion and equipping of farmers had been assumed mostly by the researchers themselves. Not only because extension is part of their research framework, but because of their viewpoint that only the

research team was capable of producing the targeted outputs, even those pertaining to technology transfer. Figure 1 summarizes these roles.

Standpoints on Researcher-Extension Collaboration in Technology Promotion

The researcher is the best extension agent

All the researchers who were recruited for this study believed that they, being the expert, were still the best persons to promote their technologies. These were excerpts from their narratives:

The functions of R & E are in one person, the faculty. Once a technology is mature, we transfer it to farmers.

Under our setting, the researchers play the role of the researchers and extensionists, because they can explain very well the technology to whoever is the client. If the researcher uses the traditional route, that he passes on [the knowledge] to extension, there is disconnect.

The researchers also viewed that technology transfer should no longer be passed on to extension.

It's the researcher who should carry the technology transfer, because they know what they are saying.

There are many questions raised during the technology transfer, such as how the farmers could make use of the technology which the extensionists could not answer.

Apparently, technical competency is required to promote a technology, and because only the researchers possess it, only they are relied upon to assume the role of transfer agents. This is what the researchers, basically, is trying to communicate.

What appeared to be a constraint for relegating the role of technology promotion to the extensionists, based on the researchers' perspectives was the extensionists' lack of training and capability to explain to the end users the technical requirements of the technologies which the researchers themselves developed without the assistance of the extensionists.

Extensionists in auxiliary role

Promotion and equipping of farmers, a role traditionally relegated to extensionists were mentioned by the researchers to be part of their tasks, being experts in their fields of specialization. Information dissemination, also a major function of Extension, was translated to informing the end users, mostly farmers, about the existence of the technologies in the state university. This is because not only that extension is part of the research framework in the research centers, but that the researchers were convinced that only they are capable of producing the targeted outputs, even those pertaining to technology transfer. With technology transfer assumed mostly by the

researchers, the Extension's role has been as auxiliary to the researchers' promotion activities. They inform the farmers and the general public about the existence of the technologies and they direct interested individuals to the research centers. This is evidenced by the following excerpts from the narratives of the researchers:

The role of Extension people is more on creating awareness, but basically, the details of the technology come from us.

They inform the farmers that the University has developed technologies for them. The role of Extension then is to provide information. They give out flyers.

Explaining the limited participation of Extension in his goat project, he stated:

Since these are special projects, you cannot blame the researchers to carry out even the promotion and transfer of the technologies they generated because they know very well the targets and expected outputs which were submitted to the donor agency so we cannot rely on others to do these tasks for us.

Lack of interdependence between researchers and extensionists

The extensionists have noted the lack of interdependence between their department and the researchers' department in their University. One extensionist said,

When we have meetings in the past, we have reiterated that we have a role in the promotion and transfer of all technologies that are generated in the research centers. although they are externally-funded. As it is, however, we cannot decipher our link with them. The research centers have their own framework of operation, with conduct of trainings for the utilization of their technologies as part of their framework.

Our existence here is not interdependence, but we exist independently from each other.

Similar finding was also noted by Morse and Mac Namara (2020) who noted that extension work had been undervalued, because researchers were of higher profile and status than the extensionists.

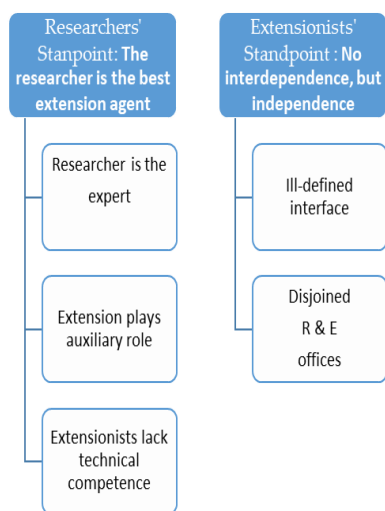


Fig. 2. Standpoints of Researchers and Extensionists

Ill-defined interface

Because of the seeming lack of convergence between the two, their supposed interface could not be drawn, according to the extensionists.

Our interface is unclear. We just get documents from them. They conduct their trainings without our information

An extension staff articulated how their Office had been reduced to being a mere recipient of the centers' accomplishment report.

As we have observed, we have been serving as, not even data bank, but as mere recipient of the researchers' accomplishment report.

Supporting this extensionist's observation of their diminished role in research centers' operations, one researcher participant revealed:

The role of Extension is—we submit reports to them. They serve as back up.

A possible reason for their ill-defined interface, according to an extensionist was their disjoined R and E offices.

Our offices are located so dispersedly that it affects our working relations, it affects our interface. How can we even have good working relationship if our offices are dispersed?

In a review of studies pertaining to factors affecting linkages between research-extension and farmers, Kumar et al (2002) noted that separate institutional housing indeed decreases the opportunities for researchers and extension workers to work together. Fig. 2 summarizes these standpoints.

IV. CONCLUSION

The findings of this study surfaced the limitations of the extension department as technology transfer agents. Their admission of their lack of competence to transfer the technologies to the farmers synchronized with the researchers' standpoint that only their research team has to be relied upon to produce the expected outputs set by their project.

There is a need to review the role of extension and to formulate a clear policy to establish the interface of researchers and extensionists in the promotion of research-generated technologies. It must be noted that the significance of reviewing and developing extension policy was emphasized in FAO's Global Consultation on Agricultural Extension to strengthen the implementation of delivery of extension services. This is especially true in a developing country such as the Philippines where extension assumes a significant role in the growth and development of agriculture (Ani and Correa, 2016). After all, outputs of research and development becomes futile unless they are disseminated to farmers and this is where the role of extension becomes crucial.

Findings of this study may serve as a springboard for state universities and colleges in the Philippines to critically reflect on their research-extension interface.

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