

Co-optation of Indigenous and Modern Farming Practices Among T'boli Farmers in Lake Sebu, South Cotabato, Philippines

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Abstract: *This study sought to analyze the co-optation of indigenous and modern farming practices among T'boli rice and corn farmers in Lake Sebu, South Cotabato, Philippines. Data were collected primarily from T'boli rice and corn farmers, extension workers, and community leaders through key informant interviews, focus group discussion, and other personal communications. Interviews were transcribed and translated. Data were analyzed qualitatively. Results show that T'boli farmers combine indigenous farming practices and belief systems with modern ones. Findings also show that co-optation is a natural process among the T'boli, is influenced by several actors, and is guided by learning principles. Farmers believed that merging indigenous and modern farming knowledge could bring about farming practices that are suitable to their capacities and needs. Since delivering extension on a top-down basis and through diffusion of innovation seems detrimental to the indigenous belief systems and practices, co-optation should be given more importance in extension.*

Keywords: *Co-optation; Agricultural Extension; Indigenous Knowledge Systems; Indigenous Peoples; Bandura's Social Learning; Vygotsky's Sociocultural Theory*

Introduction

Indigenous peoples (IPs) are not only carriers of a rich cultural heritage; they are also sources of invaluable knowledge. However, with their social or cultural identity distinct from that of dominant mainstream society, these IPs are vulnerable to being disadvantaged in the process of development (ADB, 2002).

The T'boli tribe of Lake Sebu, South Cotabato lives in an ancestral domain with abundant natural resources. Even so, these IPs often face development problems such as poverty, discrimination, and marginalization (ILO, n.d.). Because of the local and international organizations that provide development and extension services in Lake Sebu, modern knowledge has already infiltrated T'boli communities. However, many T'bolis still observe their cultural practices and traditions.

International science communities have already acknowledged the collaboration of indigenous and external knowledge and research (David, 2010). Mathias (2000) argues that indigenous knowledge (IK) provides effective alternatives to western knowledge. Instead of considering only western technologies, local people and development workers may choose IK or combine it with western technology for more sustainable results.

Serrano (1997), as cited in Seco (2002), noted that many extension efforts in the Philippines have failed because extension service providers failed to consider the knowledge system, skills, preferences, and perceptions of local people. To improve development assistance, the development community should learn about indigenous institutions and practices and where needed adapt modern techniques to local practices (World Bank, 1998). Agricultural extension aims to bridge gaps between development professionals and resource-poor farmers and find new ways to understand local knowledge, strengthen local capacities, and meet local needs. Thus, the concept of IK has gained wider currency in agricultural extension and research (Scoones & Thompson, 1994). Across disciplines, researchers and practitioners have recognized that local people's knowledge, perceptions, and cosmologies are important in planning social and economic change programs as well as in managing and monitoring ecosystem processes and functions (Lauer & Aswani, 2009).

Hence, this study aimed to analyze how T'boli farmers in Lake Sebu, South Cotabato merge indigenous and modern farming practices, a process referred to in this study as co-optation. Results of this study may be used to enrich the literature on the collaboration of IK and agricultural science. Guided by Bandura's social learning theory and Vygotsky's sociocultural theory, this study intended to show the process and value of combining indigenous and modern farming practices in indigenous communities.

1. Methodology

1.1 Research Design

As indicated in related literature, qualitative research design is more appropriate in studies exploring IK and its partnership with external knowledge (Akullo, Kanzikwera, Birungi, Alum, Aliguma, & Barwogeza, 2007; Singh & Sureja, 2006). More specifically, the case study research design was used.

For Creswell (2007), a case study is a methodology "in which an investigator explores a bounded system (a case) or multiple bounded systems (cases) over time through detailed, in-depth data collection involving multiple data sources." For this study, the researcher focused on the T'boli rice and corn farmers and their indigenous and modern farming practices. Data were gathered from various sources, both primary and secondary.

To answer the research problems, personal experiences of the research participants were explored. Byrne (2001) contends that truth and understanding can emerge from people's life experiences. T'boli farmers and other stakeholders were thus interviewed about their life as farmers and their farming practices.

1.2 Locale of the Study

Lake Sebu is a municipality in the southwestern part of the province of South Cotabato in Mindanao. It is mostly forest and agricultural lands. With a total land area of 89,138 hectares or 11.59% of South Cotabato's total land area, Lake Sebu is comprised of 19 *barangays*.

A recent report by the municipal agriculturist indicates that Lake Sebu has a total agricultural area of 26,817.513 hectares, most of which are planted with corn (14,294.00 hectares) and rice (2,172.50 hectares). Other high value crops include coffee, banana, durian, tomato, rubber, and lanzones.

Since time and accessibility are major concerns of this study, only *barangays* or villages with a concentration of T'boli rice and corn farmers were covered: Seloton, Lamdalag, Lamlahak, and Klubi. These communities were determined with the help of the municipal agriculturist and the T'boli research guide during the initial site visit to Lake Sebu.

1.3 Research Participants and Data Collection

The interviewed farmers are full-blooded T'bolis with a farm area of at least one hectare. In each *barangay*, about three to five farmers served as key informants. Interviews were conducted until the responses of the farmers were already similar and sufficient to describe their case. A total of 18 farmers whose ages ranged from 34 to 85 years were interviewed. The municipal agriculturist, the agricultural technologist in-charge with rice, and the agricultural technologist in-charge with corn from the Municipal Agriculture Office (MAO) of Lake Sebu acted as key informants, as well.

The Municipal Tribal Council (MTC) of Lake Sebu, two former Lake Sebu mayors, and the two local research guides also served as research participants through focus group discussion (FG), key informant interviews, and informal discussions, respectively. Moreover, the researcher herself was a major source of information through the field observations that she made.

Initial data gathering was conducted in May 2012. Additional and follow-up interviews and field observations were conducted from October 23 to November 7, 2012.

1.4 Data Analysis

A T'boli professor transcribed the interviews and translated into Filipino the responses made in T'boli. Accordingly, thematic analysis was used to analyze the stories gathered. Transcriptions were read thoroughly, and clusters of meanings or themes were identified. Based on the themes surfaced, assumptions and conclusions regarding the co-optation of indigenous and modern farming practices were made.

2. Results and Discussion

2.1 The Farming Practices of the T'boli

The arrival of settlers in Lake Sebu brought new farming practices that the T'boli observed and adopted. Santa Cruz Mission and later the Department of Agriculture,

through their extension projects, also provided modern farming knowledge and technologies through trainings, seminars, and demonstrations. Some farmers shared what they learned from these learning events with their fellow farmers.

Though many farmers have already adopted modern farming practices, the T'boli still respect and follow some of their indigenous ones. It was also observed that some of T'boli farmers adapted their cultural beliefs to modern times. They thus end up merging the farming practices of their elders with those shared by the settlers and the extension service providers. As a result, these farmers are able to develop farming practices that are more progressive and at the same time easier to use, practical, appropriate, and culturally sensitive.

2.1.1 Pre-planting

T'boli farmers used to practice *demsu* before they started planting. *Demsu* is a ritual wherein the farmer makes an offering to *fun koyu*, the god of the forests or trees, for good health and bountiful harvest. Eding Sugan, an 85-year-old farmer, shared: "We offer clothing, jewelry (accessories made of beads and brass), and *agong*." An *agong* is a musical instrument made of brass that T'bolis usually play to call people and stop the storm. Most of the farmers interviewed said they no longer practice this ritual; however, inspired perhaps by the teachings of Christianity which they have embraced, many of them pray before they start planting. Sometimes, farmers even make offerings to the church during mass. Thus, there seems to be an overlap of their indigenous practice of *demsu* (offering to the god of the forest or trees) and the teachings of the church.

According to farmer Badoy Langgong, fulfilling their traditions may even result to better harvest. Hence, some farmers like Lita Singkan still practice the T'boli tradition of having a feast before planting. The feast, however, is no longer grand unlike those during the time of their early ancestors. Lita Singkan said she prepares the feast for her family and laborers in the morning before they start planting. "I cook rice, tilapia, and whatever is available like cassava." Holding simple feasts shows that co-optation is done to express respect for tradition in a more practical way.

Meanwhile, some farmers are still guided by the moon when planting, opting to plant during the full moon as it has been proven to give better harvest. However, they now consider as well their available capital and the market prices of rice and corn. When the prices are or projected to be high and there is available capital, corn farmers like Floro Tony prepare immediately for planting. It could be noted then that co-optation is done to ensure good harvest, improve productivity, and increase income.

2.1.2 Land preparation.

The settlers were able to introduce to T'boli farmers relatively newer tools such as the *dadu* (plow), the *kongo* or *bolo* (jungle knife), and the *klo* or *pisaw* (handy knife with metal handle). However, farmers still use the *sangkol* (hoe) when cultivating areas that could not be reached by the *dadu*. Moreover, women corn farmers still use the *sokbong* for cutting grass when weeding. The *sokbong* is handier than the *kongo* or *bolo* or the *klo* or *pisaw* that male farmers opt to use nowadays for ease of use.

Prior to using the *kongo* and *klo*, the T'boli used the *bangkong*. The *bangkong* is a large T'boli jungle knife that the T'boli made to replace the *tok* (ancient T'boli sword) for clearing their area. It is bigger and heavier than the *kongo* or *klo*. Meanwhile, to make their soil fertile, farmers leave organic material on the soil.



Figure 1. A T'boli farmer with his sangkol.

Thus, when farmers plow the field using the *dadu*, they combine organic material such as dried leaves. Using organic material is a practice they have inherited from their ancestors.



Figure 2. A T'boli farmer plowing the field with the dadu.

Farmer Tony Gek, for example, uses the dried rice stalks to fertilize the soil. When he

uses the thresher, the following day, he scatters the rice stalks all over the rice field. He added: “Then the next day, you can already plow the field. You mix the rice stalks with the mud.” Ease of use, practicality, and appropriateness may be the reasons farmers merge indigenous and modern farming practices in land preparation. By combining the best attributes of the indigenous and modern farming practices in land preparation, the farmers are able to make their work less strenuous. Moreover, their expenses on fertilizers may be minimized.

2.1.3 Planting

Intercropping is an indigenous farming practice among the T’boli, and the use of hybrid varieties has improved the benefits from the said practice. Due to their limited resources, however, farmers are unable to plant both hybrid rice and hybrid corn at the same time. Aquino Forod said: “I can’t afford hybrid corn seeds. The hybrid corn seeds are expensive. They have higher yield, but the expenses are bigger.”

Hence, Alejandro Fitan supplements his rice production with native corn production. Ufing Uga, on the other hand, mentioned planting native white corn or hybrid yellow corn for marketing and planting *pilit* or glutinous corn for consumption.

There was only one indigenous corn variety mentioned that is indigenous to Lake Sebu: *kesila taho*, a *pilit* variety. It is sticky and can be used as a substitute for rice. Its kernel is a combination of white and violet. The two other traditional corn varieties, *masipag* and *tinigid*, are native white corn and were introduced by settlers.

Partnering hybrid rice with low maintenance native corn could help optimize the earnings of the farmer. Thus, co-optation enables farmers to maximize their available resources and improve their agricultural productivity. Such result could also be observed in combining the indigenous practice of mixed cropping to the modern practice of contour farming.

Mixed cropping is an indigenous farming practice common among the T’boli. Aside from rice and corn, the T’boli are known to plant a variety of other crops—from root crops to fruit bearing trees. Planting different crops complements contour farming, which entails strip cropping wherein strips of corn are alternated on the side of a hill with strips of denser vegetation such as the cassava that farmers often plant.

2.1.4 Nutrient management

Some of the farmers use inorganic fertilizers like the urea and triple super phosphate to keep the soil fertile. However, former mayor Basilio Salif said that many have reverted to the use of organic fertilizers. It should be remembered that even before the arrival of the settlers and Santa Cruz Mission, T’boli farmers were already using banana leaves, together with other leaves and twigs, to fertilize the soil. This time, however, other organic fertilizers like animal manure are also used. Using organic fertilizers may be attributed to the high cost of chemical fertilizers and to the harmful effects of excessive use of these chemical fertilizers. Some farmers claimed that chemical fertilizers have made their soil acidic. Nevertheless, there are farmers who still rely on chemical fertilizers, but they supplement them with organic fertilizers to lessen expenses.

Thus, co-optation in nutrient management practices probably exists because farmers find the combined practices sustainable, useful, and easy. Using organic fertilizers would not be difficult for farmers to sustain, since these fertilizers could be acquired without cost.

2.1.5 Water management

When observing the terraces of the T'boli, one could notice the trees planted around the terraces. Planting trees to prevent soil erosion is an indigenous farming practice among the T'boli. Hence, the presence of these trees around the terraces could be regarded a co-optation of indigenous and modern farming practices.



Figure 3. Rice terraces in an upland area in Lake Sebu.

The terraces are a modern technology that allows farmers to have paddies in upland areas and maximize spring water. Farmers said they learned about this technology from *Bisaya* settlers (migrants from the Visayas, one of three main island groups in the Philippines) and former employers. By planting trees, farmers are ensured that their terraces would not erode. It could thus be assumed that co-optation perhaps occurs because farmers find the combined practices useful.

Aside from planting trees and permanent crops, upland corn farmers also make canals to prevent soil erosion. Badoy Langgong said: “You have to put a waterway, so when it rains the water would not flood the field.” Both practices were noted to be effective; thus, combining these indigenous and modern farming practices could make water management more effective.

2.1.6 Pest management

It is an indigenous belief among farmers that their area should be clean to ensure good growth of crops and to avoid pests. Farmers use a combination of indigenous and modern farming tools for weeding corn areas: the *bangkong*, *sokbong*, *kelo*, and *klo*. In place of the *klo*, rice farmers use the *garab* with their indigenous tools. In addition, farmers use herbicides.

Furthermore, some farmers still believe that prayers and *anting-anting* could combat pests. Farmers still make traps, as well. They supplement these indigenous practices with the use of pesticides. Thus, though rice farmer Jovanie Salif uses his *anting-anting* to keep away the rats, he also buys poison. Jovanie Salif said: “Nowadays, our practices are combined.” Other farmers like Julises Panes even practice crop rotation.



Figure 4. A T'boli farmer weeding with the use of a garab.

In pest management, co-optation probably occurs because farmers find the merging of indigenous and modern farming practices appropriate, useful, and practical. It could be noted that among the modern tools, none were actually designed specifically for women. Hence, the indigenous tools for women are still popular among farmers.

Meanwhile, the *anting-anting* (amulet) may be preferred due to minimal costs if there are any. Farmers, however, use poison perhaps for additional peace of mind. It could also be that the poison is expensive for farmers, so they supplement it with their *anting-anting*.

2.1.7 Harvesting

Farmers also adopt a combination of indigenous and modern practices when harvesting rice and corn. For one, even if corn farmers harvest their corn exactly 105 days after planting, they still use the *blis* in dehusking. Made from bamboo, the *blis* is a small indigenous hand tool with a pointed tip.

Moreover, upholding traditions and cultural values are still evident among the T'boli. For T'boli farmers, harvesting used to be a community affair. T'boli farmers practice *kemini*, a harvest ritual wherein the farmers harvest a portion of their rice field and later cooks it to share with the relatives or neighbors who would help the farmers harvest the rest of the rice.

Though the practice of *kemini* is no longer practiced, the essence of sharing is still important among most of the farmers interviewed. Farmers still make it a point to share a portion of their harvest with their neighbors. This time, however, they have become less wasteful by securing first what they need and would sell, and then giving only the excess. Doing so allows farmers to increase their income.

2.1.8 Post-harvest

Some farmers still prepare feasts after harvesting, but they no longer prioritize these feasts. In fact, for Jovanie Salif, having a drinking session with his friends would already suffice. Also, unlike his ancestors who give baskets of rice to all their neighbors, Jovanie

Salif only gives to those who helped him harvest. Instead of paying money, he gives sacks of rice to the harvesters. He said: “For every 13 sacks of rice, the harvesters get one sack to be divided among them.” Such practice helps minimize expenses.

However, there are still rice farmers like Alejandro Fitan and Lita Singkan who hold feasts. Feasts are a form of thanksgiving; if their harvest is good, farmers roast chicken, grill tilapia, and cook the rice that they harvested to share with others.

Nowadays, farmers keep their feasts simple and invite only their immediate family and close neighbors. Co-optation thus allows farmers to uphold their tradition of sharing even during difficult times.

Corn farmers also share portions of their harvest with their community. When Tony Gek and the other farmers harvest their upland corn, they share their harvest with their neighbors. Tony Gek said: “I invite my neighbors to eat in my house, but no I longer prepares an elaborate feast.” Keeping the feast simple allows Tony Gek to minimize expenses and increase his income.

With regard to storage, sacks are often used to store rice and corn. The *sokong*, however, is still used if a farmer needs to store seeds for a longer period of time. The *sokong* is the term for the main stem or culm of the *sufu*, a bamboo variety. Badoy Langgong shared: “That is why the T'boli survive. They keep grain in the bamboo. Thus, even if there is no harvest yet, they have reserved food.”

Even the extension workers interviewed acknowledged the effectiveness of the *sokong* in storing rice seeds. T'boli farmers used to plant only once a year; hence, they needed a storage place that pests such as rats could not penetrate.



Figure 5. The *sokong* where the T'boli store their rice and corn seeds.

According to T'boli farmers, storing seeds in the *sokong* prevents rats from eating their seeds. According to the SCMSI manual, seeds are stored from five months to one year.

Sabang Kala said: “If you plant immediately, you put the seeds in a sack. If the farmer would not plant right away, he or she could use the *sokong* to store the seeds.” Combining

the indigenous and modern ways of storing seeds thus provides farmers with the storage system that best fits their needs.

2.1.9 Economics and marketing

Traditionally, the T’boli practiced subsistence farming. The farmers said that their ancestors only planted for consumption. Nowadays, farmers sell their harvest; however, they still keep a portion of their produce for their own consumption. Merging the indigenous practice of planting for self-sustenance and the modern farming practice of selling their rice and corn enables farmers to save on food expenses.

In summary, by combining the best attributes of indigenous and modern farming practices in various stages and aspects of production, the T’boli farmers were able to develop farming practices that are more suitable to their needs and conditions.

2.2 The Process of Co-optation

Co-optation is a natural process influenced by several actors and governed by learning principles. Figure 6. shows how T’boli farmers combine indigenous and modern farming practices. T’boli farmers use different approaches to learning that support Bandura’s social learning theory and Vygotsky’s sociocultural theory: following tradition set by the elders, observing migrant farmers, and interacting with fellow farmers and extension service providers. Extension service providers include Santa Cruz Mission, DA extension workers, and seed and chemical companies.

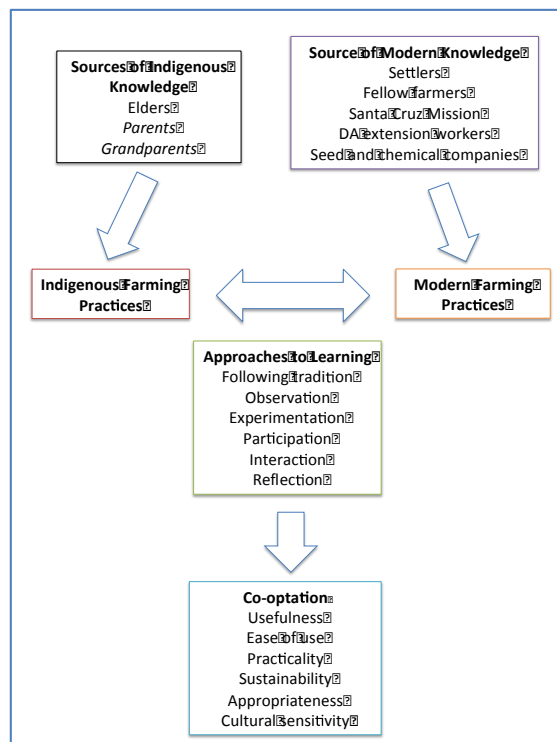


Figure 6. The process of co-optation.

Bandura (1971) argues that all learning that result from direct experiences could also occur by observing other people's behavior and the consequences of such behavior. Because of man's capacity to learn by observing others, one could acquire large, integrated units of behavior without having to develop the patterns gradually through trial and error (Bandura, 1971). As in the experience of the T'boli farmers, they were able to adopt the farming practices of fellow farmers by simply observing them.

On the other hand, Vygotsky's sociocultural theory highlights the important role of social interaction in developing cognition. Vygotsky believed that everything is learned on two levels: through interaction with others, and then integrated into the individual's mental structure (UNESCO, 2003). Through their interactions with elders, farmers were able to acquire indigenous knowledge. From different extension service providers and other farmers, on the other hand, T'boli farmers were able to learn modern farming practices.

However, it was observed that farmers did not automatically combine new farming knowledge or practices that they have observed from the settlers and fellow farmers with the old ones that they have learned from their ancestors. A few old farmers preferred their old ways, while others opted to use new farming practices altogether.

The T'boli farmers appear to engage in reflective learning wherein they reflect first on the benefits they would gain as well as on their ability to sustain additional costs attached to the adoption of modern farming practices.

Therefore, farmers have considerations that need to be satisfied before they adopt a new practice or merge it with their old ones: usefulness, ease of use, practicability, appropriateness, and cultural sensitivity.

2.2.1 Usefulness

Farmers combine farming practices that are proven to give them healthy crops and greater yield. Effectivity is a major concern; hence, farmers combine practices that could give them the best results. Alejandro Fitan said: "We combine the best aspects of the practices that benefit us—both from the Christians and our ancestors." This complements Roling's (1988) assumption that, in learning, only the ideas and inferences that prove useful are retained.

2.2.2 Ease of use

Ease of use is another important consideration when farmers merge indigenous and modern farming practices. For instance, it is a common practice among T'boli farmers to keep their area clean. Traditional farmers remove weeds and other unwanted plants by hand and with the use of their indigenous hand tools. But since they are cultivating more land now, they need to use herbicides to make their work less strenuous.

2.2.3 Practicality

The T'boli have limited financial resources; thus, farmers opt for farming practices and inputs that entail minimal expenses. This probably explains why farmers use organic fertilizer. Aside from being environmentally friendly, these organic fertilizers could be acquired for free. This sense of practicality is also evident in the way farmers uphold their rituals. Instead of practicing *demsu* the way their ancestors did, which some young farmers consider a waste of time, farmers nowadays opt to pray without their traditional offerings. Similarly, the feasts that they prepare nowadays are much simpler than those in the past.

2.2.4 Appropriateness

For the T'boli, appropriateness often pertains to the right choice of tools for the situation and the user. This probably explains why farmers have an assortment of tools. The T'boli may even be commended for their gender sensitivity, designing tools specifically for women. The tools, which are smaller and lighter, help make the women's work in the farm less difficult. In addition, the adoption and co-optation of farming practices seem to depend on the farmers' capacities and available resources. For instance, most farmers have limited educational background and finances; therefore, the adoption of complex technologies may seem inappropriate for them. Farmers tend to choose the farming practices that are simple and within their means.

2.2.5 Cultural sensitivity

Cultural values are important to the T'boli. Instead of completely neglecting rituals that some younger farmers consider a waste of time, many of the farmers interviewed still pray before they plant. This allows them to preserve their religiosity and faith in a more Supreme Being. Praying also adds to their peace of mind. Farmers believe, as their ancestors have taught them, that offering prayers could help ensure bountiful harvest and good health in their family. Also, though advised to manage more effectively their finances, farmers still prepare small feasts prior to planting and after harvesting.

3. Conclusions, Recommendations, and Implications

3.1 Conclusions

The farming practices of the T'boli are a combination of the old and the new. Through the years, farming traditions were passed from the elders to the young. T'boli farmers also experimented on their own by trying and adopting new technologies. Most of them merged the old and the new practices with the aim of improving their farming practices and agricultural productivity without compromising their culture and traditions.

The co-optation of indigenous and modern farming practices among T'boli farmers, triggered by the T'boli's observation of and interaction with other farmers and / or extension service providers, could thus bring about farming practices that are suitable to the capacities and needs of the farmers. However, combining indigenous and modern farming practices requires reflexivity wherein farmers relate themselves with their social contexts and vice versa. Accordingly, farmers only adopt farming practices that appear fit to their needs, culture, and conditions.

The farmers' ability to reflect and decide on the most appropriate and useful farming practices for them shows their potential as partners in knowledge development. Therefore, extension service providers should acknowledge that T'boli farmers have useful knowledge that may be used to create agricultural practices that are more adaptive to local conditions. Doing so may consequently lead to more effective delivery of extension interventions in T'boli communities in Lake Sebu.

3.2 Recommendations

Policymakers should be able to set an enabling environment for co-optation of indigenous and modern farming practices to occur. They should work at integrating IK to the current agricultural knowledge and information systems as co-optation has the potential to improve productivity, increase self-reliance, and develop culturally sensitive and environment-friendly farming practices. Furthermore, policymakers should develop a

policy that would specify participatory planning and inclusion of IPs in planning sessions. Since indigenous knowledge is situated within a political, social, and religious context, its inclusion into the extension system through the participation of IPs in planning may result to better outputs.

On the other hand, there should be specific extension programs or projects exclusive to T'boli farmers. These programs or projects should be able to acknowledge the T'boli farmers' available resources and integrate or at least recognize their traditional beliefs, values, and practices. Extension workers must provide services and technologies that are more responsive to local conditions, accountable, and sustainable. Hence, the value of indigenous farming practices and the ways such practices could be merged with modern ones should be recognized and given importance in agricultural extension.

To supplement the findings of this study, researchers could examine further the results of combining indigenous and modern farming practices. Researchers could look into the impacts of such collaboration on productivity, sustainability, and self-reliance.

3.3 Implications

This study revealed that farmers themselves are carriers of valuable knowledge. Such knowledge could be combined with modern knowledge, and the improved farming practices resulting from this co-optation could be shared within the agricultural knowledge and information system.

Experimentation through farmer field schools and the popularization of IK and its co-optation with modern knowledge may therefore be effective strategies to improve agricultural knowledge and information systems. As noted in this study, merging IK and modern knowledge allows farmers to develop and promote techniques that enable them to meet their needs without relying on expensive farming inputs.

Consequently, there is a need to develop an extension framework that recognizes the importance of IK and integrates into the extension system the co-optation of indigenous and modern farming practices. Extension services in the proposed framework should focus on capacity building and empowerment through the formation of farmer groups, development of farmer leaders, and employment of participative learning. Through these extension services, it is expected that T'boli farmers would be able to improve productivity, increase self-reliance, and develop culturally sensitive and environment-friendly farming practices.

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